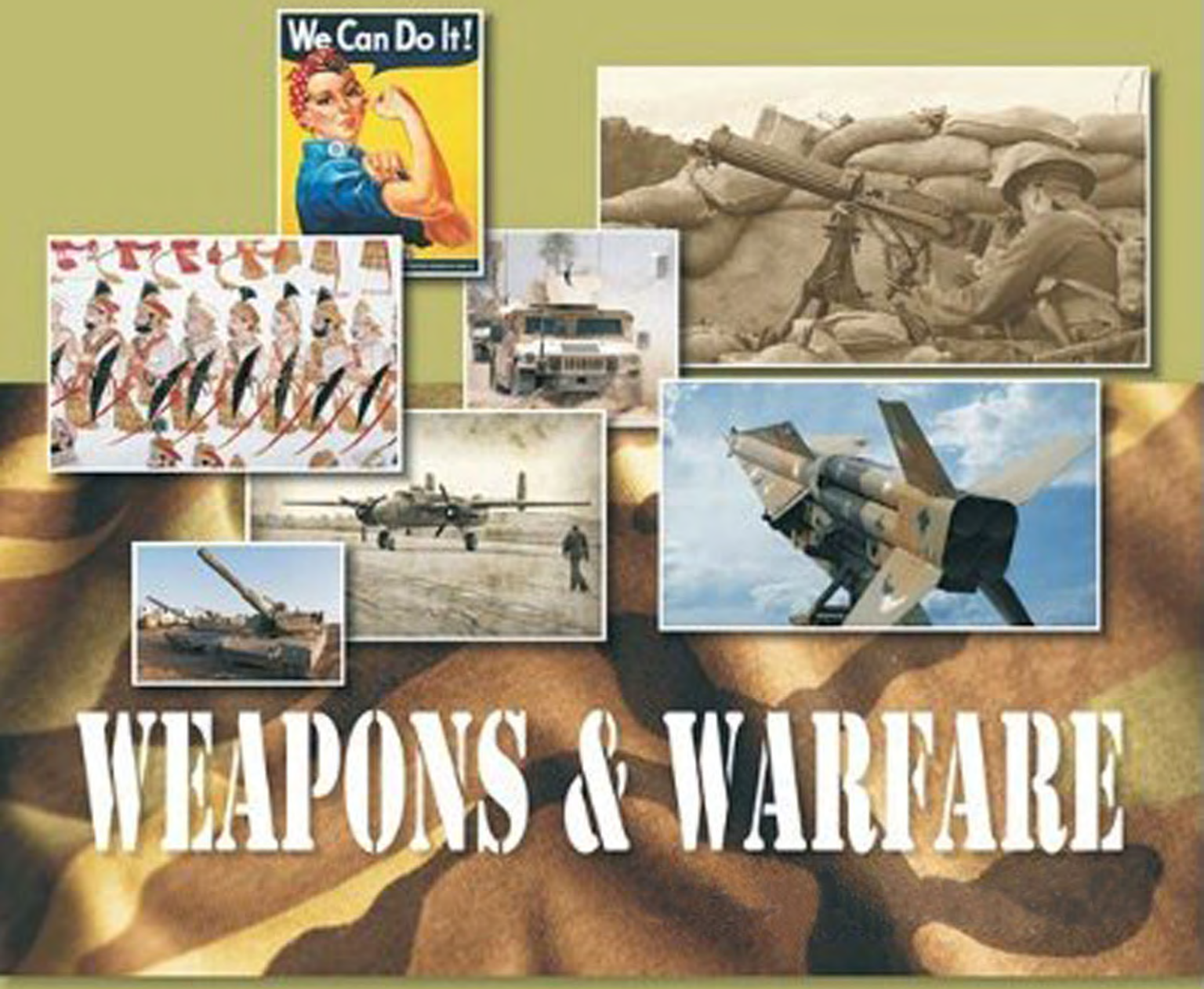

WEAPONS & WARFARE

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Publisher's Note

Originally published in 2002 in two volumes, the three-volume *Weapons and Warfare: Revised Edition* is designed to meet the needs of students seeking information about weaponry, tactics, and models of warfare from ancient times to the present, worldwide. Written with the needs of both students and nonspecialists in mind, the articles contained in this set present clear discussions of the topics, explaining any terms or references that may be unfamiliar. The focus on the technical and strategic development of weapons and tactics, more than on a narrative chronological history of events, allows students of history, political science, and technology to gain a broad understanding of both the scientific and the strategic advances made over time and geography. The new third volume adds the essential dimension of placing these topics in broad cultural, sociopolitical, and ethical contexts.

The expanded edition covers all topics included in the original two-volume edition and adds 58 new essays and appendixes, along with 22 heavily revised and expanded essays and appendixes. In addition to the new and revised text, all previous entries have been fully updated: Bibliographies have been expanded to add recent scholarship, and "Films and Other Media" sections have been expanded or added where they were missing before. The new third volume adds a fresh dimension, offering social, cultural, ethical, and political perspectives on warfare and weaponry.

Scope and Coverage

Weapons and Warfare, Revised Edition offers 141 essays (56 completely new) and 7 appendixes (2 completely new). In the first two volumes, these are arranged chronologically within thematic groupings. Hence, volume 1, *Ancient and Medieval*, first covers "Weapons and Forces" for the period ("Clubs, Maces, and Slings" through "Warships and Naval Warfare"), followed by sections of essays on "The Ancient World" and then "The Medieval World." Similarly, volume 2 covers "Weapons and Forces" ("Swords, Daggers, and Bayonets" through "Naval Development: The Age of Propulsion"), followed by sections addressing modern warfare, from "Western Warfare in the Age of Maneuver" through "Warfare in the Global Age." Each "Weapons and Forces" section covers weapons and strategies, while the rest of the essays examine specific cultures and empires in terms of their weapons and methods of warfare as well as their military achievements.

Volume 3, *Warfare: Culture and Concepts*, presents 35 overviews (34 of them new) of the way warfare, weapons, and military history have been expressed socially, politically, and in the arts, addressing not only these societal aspects of warfare but also "behind the battlefield" theories, strategies, and policies. These overviews are followed by a section of Research Tools consisting of 7 appendixes; 2 new appendixes have been added as valuable teaching tools: "War Films" and "War Literature." A comprehensive Subject Index ends this final volume.

Organization and Format

The essays in these volumes are organized into three essay types:

- *Weapons Overviews* are organized with sections on "Nature and Use" and "Development" of each weapons type. The first section describes the basic concepts behind this category of weapon and details the ways these weapons were used during the period in question; the second section follows their evolution over the period, paying special attention to key developments. Secondary sources for further study are listed in the "Books and Articles" sections that close the Weapons Overviews.
- *Historical Overviews*: In volumes 1 and 2, Weapons Overviews are followed by chronologically and geographically arranged sections cov-

ering major historical periods and civilizations and their contributions to military weapons, technologies, and strategies. These Historical Overviews contain subsections covering "Political Considerations" (where relevant), "Military Achievement," "Weapons, Uniforms, and Armor," "Military Organization," and "Doctrine, Strategy, and Tactics." The worldwide geographical scope of the set is truly evident in these overviews, which include essays on Eastern and Southern Asia, the Middle East and Africa, and the Americas, as well as Europe. The historical range of the set is equally clear, covering the evolution of warfare from the time of the earliest Mesopotamian empires into the third millennium.

Historical Overviews also feature a unique section headed "Ancient [or Medieval or Contemporary] Sources," which summarizes for both students and researchers the primary sources upon which historians have drawn, in concert with other evidence (archaeological, for example), to form their understanding of the military history in question. These sections are invaluable for further in-depth research, and they provide an essential complement to the following section, "Books and Articles," a bibliography of secondary sources listing the most authoritative and editorially vetted print resources for understanding the warfare of the period or civilization at hand.

- *Culture and Concepts Overviews:* Finally, the new third volume's Culture and Concept Overviews approach warfare and weaponry from several different perspectives: sociological, geographical, cultural, political, ethical, religious, tactical, and strategic. These essays provide the perspectives from which the other essays can be understood in a broader context. Each begins with an "Overview" (definition) of coverage, followed by a summary of its "Significance" in regard to warfare and then a complete historical overview, with subsections reviewing the "Ancient World," "Medieval World," and "Modern World."

Special Features

Volume 3 ends with a set of valuable research tools, beginning with two new appendixes: an annotated list of "War Films" and an annotated list of "War Literature." These are arranged chronologically by war, for use in teaching. The annotations guide students and teachers with regard to the novels' or films' usefulness in historical study (and where they may fall short, as well). Other research tools in this section include a Lexicon of military terms (expanded), an annotated list of Military Theorists (expanded), a Time Line (expanded), a Bibliography (expanded), and an updated list of Web Sites. A comprehensive and fully cross-referenced Subject Index rounds out the set.

The essays are accompanied by more than 70 time lines, lists of "Turning Points" that bring to readers' attention the key battles, inventions, and other events bearing on the technology or civilization covered. These are joined by 251 photographs and artists' renderings depicting the weapons discussed, as well as maps that direct readers to the geographic areas inhabited or conquered by the empires, civilizations, and cultures discussed.

Usage Notes

The names of wars and battles and the names of military leaders and other personages vary from resource to resource and from country to country, depending on variables such as political perspective, the different methods of transcribing non-Roman languages, and customary usage over the years. In these volumes, the names that are used in the essays, along with dates of events and for persons' life spans, are those that, over time, have proved to be the appellations, spellings, and renderings most familiar to the general English-speaking audience. Chinese names have generally been given in their Pinyin form, with Wade-Giles transliterations cross-referenced in the index.

Sources consulted to confirm these data are recognized as authoritative and hinge on a consensus of the most trusted available. Birth and death years follow the first mentions of key personages' names where appropriate, and titles of works are introduced using their original dates of appearance (or publication in the modern world), along with original-language ti-

tles where available. Key foreign terms are introduced in italics where they are defined, and all wars and battles are accompanied by their years (or date spans) of occurrence upon first mention in each essay.

ACKNOWLEDGMENTS

This revised edition of *Weapons and Warfare* owes a debt to many participating consultants and contributors. Chief among these is John Powell, Professor of History at Oklahoma Baptist University, who conceived of the first edition and continued his role as the chief creative force for this revised edition, including coverage, arrangement, and design of the essays and all supplemental features of the set. Both as a respected historian with specializations in modern Britain and as a longtime classroom teacher, he provided invaluable input on what works best for teaching the curriculum—not only military history but also related curricula involving cultural studies and perspectives.

Steven L. Danver of Mesa Verde Publishing commandeered the revised edition's acquisitions and revisions. Managing editor of *Journal of the West* and a visiting professor of history in Seaver College at Pepperdine University, Dr. Danver earned his doctorate in history at the University of Utah, concentrating on the history of American Indian peoples and the American West.

More than 100 contributors, including historians, political scientists, and other academicians, have lent their knowledge and insight to this project, and without their expertise the significant revisions of the essays, as well as the new contributions, would not have been possible. Their names and academic affiliations appear on the following pages.

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WEAPONS AND FORCES

Clubs, Maces, and Slings

Dates: To c. 1500 C.E.

Nature and Use

Clubs, maces, and slings, originally appearing in primitive times, are alike in their antiquity and concussive effect. Clubs are stout sticks, weighted at the striking end and usually made of hardwood, although bone, horn, and stone were also used. Clubs, the oldest weapons, have taken many forms throughout history. As small personal weapons, less than 2 feet in length, they could be thrust into belts and carried anywhere. Larger war clubs—from 2 to 3 feet in length—were wielded with one hand, and very large clubs, from 3 to 6 feet in length, were used with both hands. Shafts could be straight or curved, with cylindrical, ball-shaped, or broad, flat heads. Shaft edges could be sharpened, knobbed, spiked, or fitted with naturally sharp items, such as shark's teeth, rays' tails, or obsidian blades.

Although hand weapons could be used with more accuracy and force than thrown ones, clubs meant for throwing were also used. These "throwing sticks" were usually 2 to 3 feet long and could be curved, such as the Australian boomerang, or could have a ball and handle, such as the African knobkerrie. Users of these weapons hoped either to kill an enemy outright by crushing its skull or to incapacitate it by breaking its bones or stunning it. The club has seen worldwide use among primitive tribal peoples and early civilizations, and simple forms were wielded by early hominids.

Developed from the club, the mace is a heavy weight attached to the end of a handle. Stone maces appeared during the seventh millennium B.C.E. in the Neolithic Near East, and their use spread into Europe, Egypt, and India, where they were employed into the early Bronze Age. A mace was made by inserting 2- to 3-foot-long handles into holes bored through stones that had been worked into spherical, or at least symmetrical, shapes. Maces with bronze or iron heads became popular during the medieval era

Library of Congress

Greek slingers, circa 400 B.C.E.

(approximately 500-1500 C.E.), and their use spread from Central Asia and the Near East into Europe, the Far East, and North Africa. Although intended to injure people, maces were also designed to damage armor: smashing it with blunt heads, penetrating it with spiked or knobbed heads, or cutting it with flanged or winged heads. Maces could also be thrown, although this was an unusual usage. The military flail, which had mace heads or clubs attached by chains to the handle, also appeared during the medieval period but may have been more of a demolition device for siege warfare than a combat weapon, at least in Western Europe.

The sling was most likely a product of the Neolithic Near East (ninth millennium B.C.E.) but may have had earlier origins. It was probably derived from throwing stones whirled about by attached lashes; the South American *bolas* is an example. The most common sling, the hand sling, consisted of a 3-foot-long strap with a pouch in the center in which a missile, usually a stone, was placed. The user would take both ends of the sling in one hand, whirl the stone around quickly, and then let go of one end of the sling. The released stone would then fly toward its target. Hand slings—made of leather, wool, woven grasses, sinew, or human hair—have been used by many primitive peoples worldwide for hunting, warfare, and protection from predators. They were popular among civilized peoples in the Indus Valley, the Near East, Greece, Sicily, Spain and the Baleares, Celtic Europe, Mesoamerica, and the Andes.

Skilled slingers could hurl heavy stones to damage armor out to 15 yards, strike small targets with stones out to 30 yards, shatter skulls out to 50 yards, hit man-sized targets out to 180 yards, and throw light lead shot over 360 yards. In battle, slingers were employed to harass enemy formations before hand-to-hand combat began, to pursue routed foes, to ward off enemy cavalry and elephants, and to protect one's own troops from missile attacks. During sieges slingers provided covering fire, harassed working parties, and hurled incendiaries into buildings or siegeworks.

Another type of sling was the staff sling, apparently invented in the Roman Empire and used at sieges in medieval Europe. It was essentially a hand sling attached to a 4-foot staff. The user held the staff horizontally in both hands, then swung it upright, flinging the missile from the sling attached to the end of the staff.

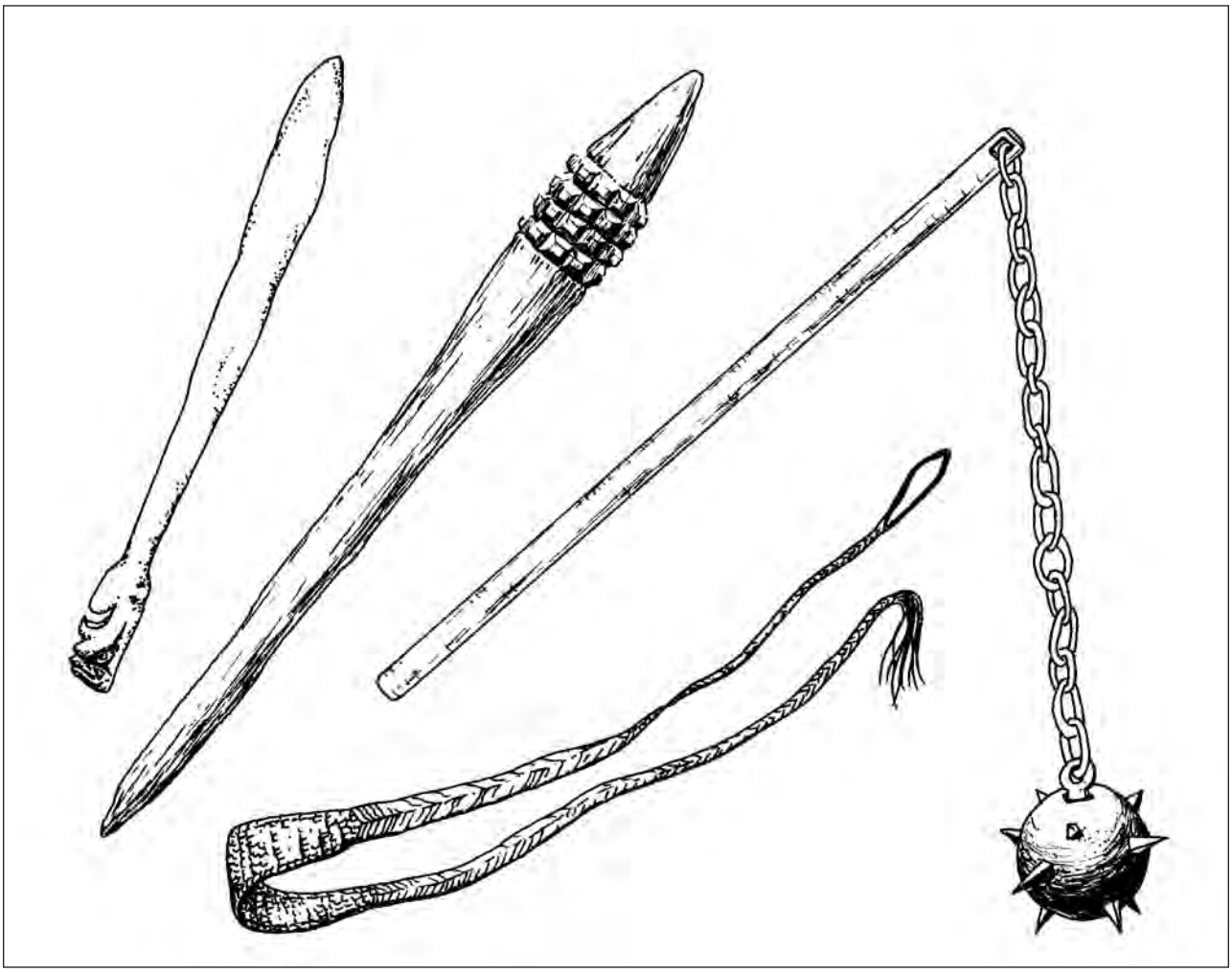
Turning Points

9th millen. B.C.E.	The sling makes its first known appearance.
7th millen. B.C.E.	The stone-head mace makes its first known appearance.
c. 2500 B.C.E.	Metal armor is developed in Mesopotamia, making the stone-headed mace obsolete.
c. 1000 B.C.E.	Metal-headed maces become common in Europe.
401 B.C.E.	Slings are used to great effect against the Persians at the Battle of Cunaxa, outranging Persian bows and arrows.
c. 31 B.C.E.	Specialist corps of slingers largely disappear from ancient armies.

DEVELOPMENT

The club's developmental history is largely lost, because of the perishability of wood. By approximately 50,000 B.C.E., humans had developed the creativity and skill to produce any of the many club designs found among modern tribal peoples. In combat, prehistoric hunter-gatherers and small groups of farmers and herders probably preferred, whenever possible, to ambush or raid their enemies, thereby avoiding the hazards of close combat made more dangerous by their lack of armor, numbers, and strong leadership. Clubs would have been used mainly to finish off wounded or trapped foes. In direct confrontations hunter-gatherers would have hurled missiles, including throwing sticks or slingstones, at one another from a safe distance, contenting themselves with low casualties.

As populations expanded in Neolithic Europe and in the Near East, more complex societies arose in which powerful chiefs led their war-



Kimberly L. Dawson Kurnizki

From left to right, an Iroquois club from eastern North America; an aboriginal throwing stick from northwestern Australia; a spiked Swiss "morning star" mace; and a braided sling from the Pacific Islands.

riors into close combat. This explains the appearance of the stone-headed mace and of new sling projectiles that were added to the usual water-worn stone. Worked spherical stone projectiles appeared by about 6000 B.C.E., kiln- or sun-hardened clay balls by about 5000 B.C.E., and biconical-shaped missiles by about 4000 B.C.E. Such aerodynamic shapes and regularized sizes allowed slingers to shoot farther and with more accuracy.

In open combat, warriors probably exchanged fire with slings and bows for some time before advancing to fight with spears, maces, and clubs, hurling throwing sticks as they neared their opponents. Piles of slingstones found in the destruction horizons of Neolithic and Chalcolithic settlements also indicate sling use in early siege warfare. Incendiary projectiles, in the form of heated clay shot or grasses plaited around stones, probably also made their initial appearances during Neolithic sieges.

As early civilizations developed in both hemispheres, so did armies. Units of like-armed men organized either as light infantry outfitted with missile weapons or as heavy infantry equipped with close combat weapons. Light infantry began battles by

showering enemy formations with missiles, hoping to disrupt them. The heavy infantry then charged, fought the enemy infantrymen, and put them to flight, whereupon the light troops pursued. Slingers served as light troops in Bronze Age Mesopotamia, the Indus Valley, and Greece.

Throwing sticks were used in Mesopotamia until about 2000 B.C.E. and for another millennium in Egypt. Stone-headed maces played an important role in infantry combat in Old and Middle Kingdom Egypt (c. 3100 to 1674 B.C.E.), in Canaan during the same era, and in the Indus Valley's Harappan civilization (c. 2500 to 1750 B.C.E.). In the Americas, the Incas (c. 1200 to 1572 C.E.) used a combination of slingers, spearmen, and macemen, the maces having circular bronze heads with six points. The Aztecs of that era employed slingers and club bearers, some of whom utilized the *maquahuitl*, a powerful two-handed, obsidian-edged sword-club.

The stone-headed mace had virtually disappeared in Mesopotamia by approximately 2500 B.C.E., probably because the area's fierce military competition spurred the development of metal arms and armor. Bronze could be turned into sickle swords, socket axes, and other new weapons, while copper helmets backed with leather spread the impact of a club or stone macehead blow enough to prevent their wearers from being stunned or killed. By the time of the New Kingdom (c. 1570 to 1085 B.C.E.), Egypt had adopted armor as well. As armor and metal weapons became common, clubs and stone-headed maces disappeared. Maces with metal heads were used in the Incan Empire, and mace-like bronze weapons continued in use in Egypt. Bronze maceheads similar to medieval weapons have been discovered in Armenian tombs of the second half of the second millennium B.C.E. Maces had long been associated with authority: Narmer, one of the first Egyptian Pharaohs (c. 3100 B.C.E.), is depicted wielding a mace. Other evidence suggests that mace use was restricted to officers, such as those of the Neo-Assyrian Empire (911 to 612 B.C.E.), and kings, such as the Scythian monarchs (seventh to fourth centuries B.C.E.) for some two millennia.

It was not until the early Middle Ages that metal-headed maces became popular. Steppe nomads and Muslim warriors—Arabs, Iranians, Turks, Mongols—employed them as an important secondary weapon for their lance- or bow-armed cavalry, an alternative to the sword and ax. The Chinese, Indians, Byzantines, Russians, Eastern Europeans, and, after about 1000 C.E., Western Europeans then followed suit. Infantry only occasionally used maces, because foot soldiers could accomplish more with staff weapons. The mace was more useful to cavalry in easy reach of foot soldiers' heads. As long as mail or lamellar armor remained the norm, maces could be rather light, with rounded heads, either symmetrical or nonsymmetrical in form, or equipped with knobs or spikes. Flange-headed maces also appeared early and became common in Europe once plate armor came into use. However, lighter maces survived as emblems of authority. The club also survived as an ersatz weapon or police arm: William the Conqueror is depicted bearing one at Hastings, where he defeated the English in 1066 C.E. The club probably denoted William's rank, distinguishing him from lesser men carrying maces.

The sling enjoyed more common usage than the mace. David's slaying of Goliath is only the most famous use of the sling by the ancient Jews. The Neo-Assyrian Empire considered its slingers so valuable it armored them. Certain peoples were noted as skilled slingers. The Baleares, inhabiting the Balearic Islands off the coast of Spain in the western Mediterranean, used slings from childhood. They carried three slings of different sizes—short, medium, long—for various ranges. They could allegedly hurl stones weighing up to 14 ounces, smashing armor at close range. Assyrian slingstones, by contrast, averaged only 7 to 9.5 ounces in weight. Balearic slingers served with Hannibal (247-182 B.C.E.) and Julius Caesar (100-44 B.C.E.) and remained known into the Middle Ages for their skill with slings. Another noted group of slingers were the Greeks of Rhodes. During the Battle of Cunaxa (401 B.C.E.), slingers from Rhodes used lead shot to outrange Persian bows and slings—the latter with heavy stones—to help the Greek army make its escape.

Lead shot first appears in the late second millennium B.C.E. on Crete and Cyprus. Cast in molds and weighing 0.7 to 4.5 ounces, lead shot was often

marked with insults, invocations, or identifications. It outranged clay or stone shot and was more difficult to see, and thus harder to dodge. It could bury itself in the target's flesh, requiring careful surgery to extract. In the second century B.C.E. the Greeks invented a sling that fired a *kestros*: a bolt with a pointed iron head 6 inches long, set in a winged wooden shaft 9 inches long. However, the use of the kestros never spread beyond Greece.

After the Pax Romana, a period of peace within the Roman Empire that began in approximately 31 B.C.E., specialist corps of slingers largely disappeared. The Imperial Roman army tried to compensate by training all recruits in use of the sling. It is unlikely, however, that men introduced to the weapon late and on a part-time basis became strong, accurate slingers. The staff sling, easier to use than a hand sling, is a likely response to this situation. Although the sling never attained the popularity in medieval times that it enjoyed in antiquity, it remained in use in militias and peasant revolts. Monarchs such as King Frederick I Barbarossa of Germany (r. 1152-1190), King Edward I of England (r. 1272-1307), and Ottoman Sultan Mehmed II (r. 1451-1481) also recruited slingers to engage in siege warfare. In Spain the sling remained especially important: At the Battle of Nájera in 1367 C.E., for instance, English longbowmen suffered heavily from Spanish slingers before finally defeating them. Spaniards in turn suffered at the hands of Mesoamerican and Andean slingers. In various regions the weapon is still used by shepherds, sportsmen, hunters, and rioters.

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Scott M. Rusch

Picks, Axes, and War Hammers

Dates: To c. 1500 C.E.

Nature and Use

Picks, axes, and war hammers are shock weapons. Like all members of this weaponry class, they are designed to be held rather than thrown and to multiply the amount of force that can be brought to bear upon an opponent, while also extending the warrior's deadly range beyond the length of the arm.

Prehistoric picks, axes, and war hammers were variations on a single basic design. A wooden or bone haft, or handle, served as an extension of the user's arm, so that the bone, horn, wood, stone, or metal head could be swung through a larger arc, thus acquiring more speed than could be achieved with the arm alone. When the head struck an enemy, its speed and mass transferred sudden, intense pressure to a small area and thereby delivered a wound that could be either disabling or fatal, depending upon the part of the body struck. The three weapons differed only in the impacting surface delivering the force and the type of damage that ensued.

The pick had a pointed head and was meant to puncture. The natural and most force-efficient method for wielding the pick was an overhead stroke, which meant that the head, shoulders, and frontal chest cavity of the opponent were the primary targets. Slanting and even horizontal strokes to the body trunk, although more awkward to perform, could also cause deadly injuries. Furthermore, should the pick point pierce the chest cavity, even if the blow was not swiftly mortal, the small, deep wound that the pick head made was likely to become infected.

The ax-head was a wedge with a sharpened edge that ran parallel to the haft. The battle-ax almost invariably had a single leading edge rather than double blades. It was for cleaving, slicing, and cutting. Like the pick, the ax was most easily swung vertically, but it was a more versatile weapon because of its broad edge. Although the head and shoulders were the primary points of attack, the entire body, in fact, was at risk. If the ax-head had a sharpened rather than a blunt edge, slanting or horizontal strokes could do severe damage to the arms and legs, breaking bones or severing limbs entirely. Even a glancing blow or partial contact could open a long gash or slice and cause massive bleeding. Because of this utility, axes were nearly universally employed prehistoric weapons, from the first flint heads lashed onto sticks to such specimens as finely crafted North American tomahawks and ornately inlaid Scandinavian two-handed battle-axes.

The head of the war hammer, or war club, was blunt, often only a sturdy wooden knob or lump of stone, and its purpose was to shatter and crush. Although the war hammer could break leg, arm, and rib bones, the primary target areas were, again, the head and shoulders. A direct blow to the head killed by causing massive hemorrhaging even if the skull was not caved in, but even a light or partial impact was likely to stun, at the very least. Likewise, a blow to the shoulders, with their relatively delicate clavicles, could disable enemies and leave them unprotected against further attack. A variation on the war hammer, the mace, had short flanges or spikes protruding from its head. Thus, it pierced and tore the flesh as well as shattered bones.

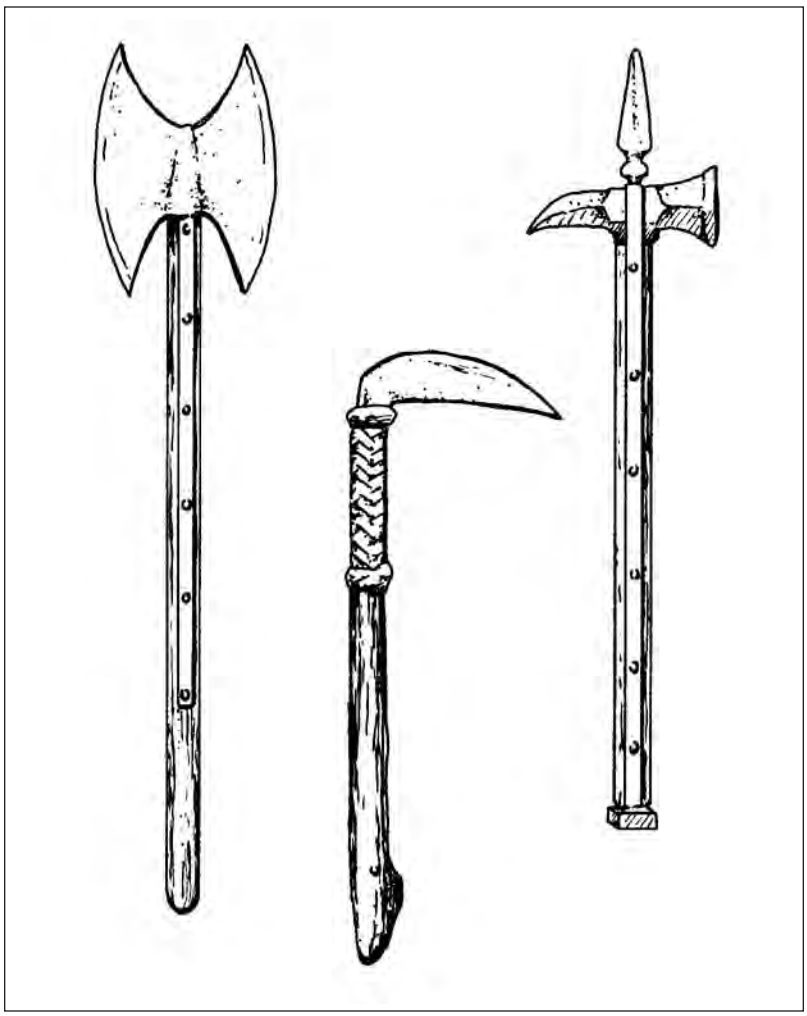
The great advantages of shock weapons were their accuracy, power, and economy. Even an unskilled warrior was capable of swinging and striking home with a pick, ax, or club, whereas it took considerable training and skill to use successfully such stand-off weapons as javelins or bows. Moreover, unlike javelins and arrows, which once sent in flight were difficult to retrieve for reuse, shock weapons posed a threat as long as warriors had the strength to wield them. On the other hand, picks, axes, and war hammers were very short-ranged, seldom extending the warriors' effective battle reach more than twice that

of the arm alone. The warrior, in close proximity to his enemy, was in imminent danger.

Combatants using shock weapons had to exploit these advantages while mitigating the disadvantages. Archaeological evidence, anthropological studies of nineteenth and twentieth century primitive societies, and surviving weapons reveal three often-employed tactical uses. Most often, battles opened with an exchange of fire from standoff weapons by the front ranks of opposing groups separated by an empty zone. If one group stopped fighting and fled, the second might pursue to kill or capture the enemy. The pursuers then used shock weapons after closing with the foe. Picks, axes, and war hammers also proved effective for fighting in confined spaces where standoff weapons were impractical: for example, a forest ambush or an assault on a fortified area. The weapons could be used to break apart defensive works and to destroy property as well as to harm people.

Last, shock weapons were occasionally used for close combat. A high degree of discipline is required for troops to meet face-to-face in a battle line, but by the Bronze Age, societies were sophisticated enough to support the requisite level of training, and this basic battle doctrine lasted into the Middle Ages. Engagements almost certainly began with exchanges of arrow or javelin fire, but then the front ranks of warriors advanced on each other until the lines collided, and warriors fought directly with shock weapons. In this hand-to-hand combat, comrades-in-arms had to be close to one another in the line, practically shoulder-to-shoulder, so that their sides were protected while they concentrated their attack on the enemy warriors directly in front of them. Wood shields were developed to protect their fronts, and the initial clash involved each opponent striving to shatter the opponent's protection in order to force an opening for a killing blow. The side that succeeded in penetrating the line and dividing its enemy usually won the battle.

During the Iron Age, however, swords and lances increasingly became the main battle weapons. Axes, picks, and war hammers were used more and more as auxiliary weapons.



Kimberly L. Dawson Kurnizki

From left to right, an early sixteenth century battle-ax with a double-headed blade; an early Japanese pick with a stone blade bound to a wooden haft; and a late fifteenth century Italian war hammer with langets securing the head to the haft.

DEVELOPMENT

By about 1.5 million years before the present, the first small hand axes were being produced as part of the Acheulean tool tradition of the Lower Paleolithic era, the earliest part of the Old Stone Age. Probably first used as tools, these axes, or bifaces, were about 4 to 6 inches in length and were made by flaking both sides of a stone to form an edge. The affixation of this biface to a handle was an innovation of the Upper Paleolithic era (35,000 to 10,000 years ago), as was the development of hammers, an evolution of the simple club. The use of obsidian or flint, which could be chipped into a much sharper edge than could other types of rock, began during the Mesolithic, or Middle Stone Age, period in Europe (10,000 to 8,000 years ago). Likewise, picks probably began as simple sticks with pointed ends more or less perpendicular to the handle and evolved in tandem with the ax, as pointed rocks or horns were attached to handles. Picks, axes, and battle-hammers appear to have been employed as weapons generally throughout the prehistoric world during the Mesolithic period, depending only on the availability of suitable materials to make them. Isolated, preliterate cultures continued to use such weapons, in some cases, well into the twentieth century. Indeed, highly developed non-Western armies used such weapons—for example the Zulu knobkerrie, a short, heavy, wooden club that could be swung or thrown—to telling effect against Western forces with firearms through the nineteenth century.

The addition of the haft, or handle, to a shaped head was the key technological step in producing shock weapons. Three common methods of attachment developed: lashing the head into a wooden sleeve, as in the vee formed by two branches of a limb; binding the head into split wood; and inserting the head into a bone socket. Rawhide or animal tendons served as lashings. During the Neolithic period (8,000 to about 4,000 years ago), stoneworkers learned to drill holes into flint by applying alternately heat and water. This process allowed them to insert a haft through the head and wedge it in firmly with shims, improving the strength of the ax.

With one face left blunt and the other shaped to either a point or a blade, the Neolithic weapons could function as combination hammer-axes or pick-axes. When artisans learned to grind the edge, rather than to form it by flaking off chips of flint, they were able to produce slimmer ax-heads with sharper edges, which enhanced the power of the weapons to pierce and slice. These finely wrought axes were valuable commodities. In some areas, notably prehistoric England, axes were highly prized for barter. In fact, archaeologists debate whether the axes were intended to be wielded or to serve strictly as a kind of currency, although they might well have served both functions.

Another innovation occurred when humans began to use copper to make ax-, pick-, hammer-, and mace-heads. The molten metal could be poured into a mold and, after cooling, cold-hammered and whetted to a fine edge. However, copper is soft and the edges quickly dulled. Bronze, an alloy of copper and tin, is much harder, and became the standard material for tools and weapons beginning about 3000 B.C.E. in the Near East. This technical advancement launched the Bronze Age. About 1600 B.C.E. Roman artisans began making tools and weapons from brass, a zinc-copper alloy harder and more durable than bronze. About 2500 B.C.E. in Sumer, craftspeople moved the socket holding the handle to the back of the ax-head, reducing its weight and giving the weapon better balance.

In Europe during the Neolithic period, maces were more common than axes, and at Çatalhüyük in modern Turkey, the site of a large Neolithic settlement, archaeologists uncovered copper maces dating from as early as 7000 B.C.E. Because they were difficult to make, these early copper maces may have been the weapons of leaders. An indication of their status appears in a small relief sculpture dating from around 3100 B.C.E., showing Menes (c. 3100-3000 B.C.E.), the first Pharaoh to rule all of Egypt, striking an enemy's head with a mace.

The advent of iron and steel made it possible to shape more elegantly flared, sharper ax-heads with thinner heads, as was true, for instance, with the two-handed Viking battle-ax. Maces became common weapons during the Middle Ages, whereas picks

were relegated to use in warfare primarily for digging and breaking down defensive structures. These weapons became obsolete after the introduction of firearms, and by the beginning of the sixteenth century, European armies were unlikely to carry them into battle.

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Roger Smith

Bows and Arrows

Dates: To c. 1500 C.E.

Nature and Use

Bows and arrows are among the oldest and most popular weapons of all time. Although simple in design, their invention represented one of the most important technological innovations of primitive humans, one that allowed individuals to attack both animal and human targets with greater force, from longer range, and with a more rapid rate of fire than had been possible with the spear or other handheld projectiles. Bows and arrows were presumably first used for hunting, perhaps as early as 30,000 B.C.E., but Neolithic cave paintings show them deployed as weapons against other humans by about 10,000 B.C.E.

In its most basic form the bow consists of a shaft of wood with a string attached to both its ends. When this bowstring is drawn back, the energy of the archer's pull is transferred to the bending bow, and after the bowstring is released, this energy is channeled through the bowstring to project the arrow forward. The arrow's speed and distance depend on the flexibility of the bow; a stiffer bow requires more strength to string and shoot, but this added resistance translates into greater velocity and distance for the arrow itself.

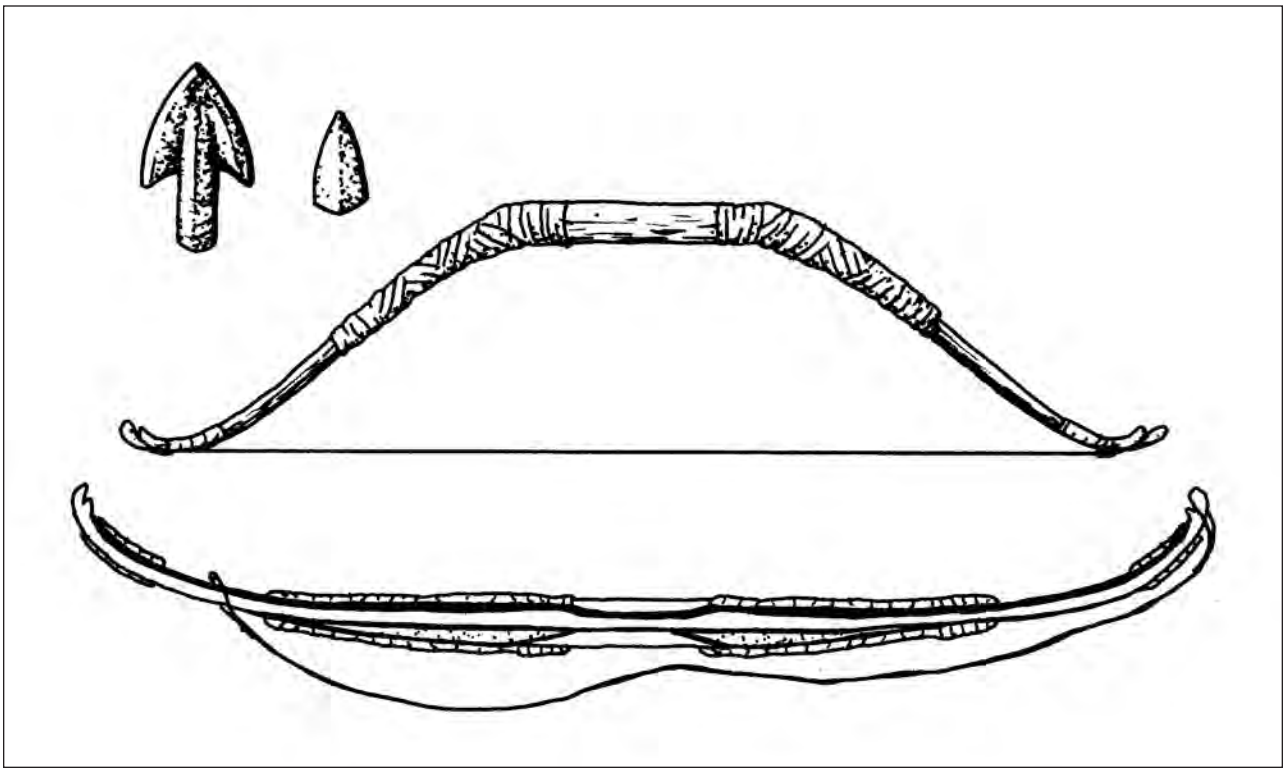
The varieties of ancient bows were as numerous as the peoples who made them, but they generally fall into two categories. A self bow—also called a simple bow, stave bow, or longbow—was constructed from a single piece of wood, although bows of reed and other materials are known. They measured from 1.5 to more than 6 feet in length, and their effective range could extend to more than 200 yards. Self bows were extremely simple to make, but a suitable type of wood was required: Too pliant a wood packed little power, whereas one that was too stiff might break or prove difficult to use efficiently.

The second basic type of bow was the composite bow. It consisted of either a single piece or several pieces of wood glued together. This wooden core was reinforced by bone on the interior, or belly, and by sinew on the outside, or front, lending the bow greater elasticity. Composite bows were extremely strong and difficult to string, but they had an effective range of up to 300 yards, far greater than that of the self bow. They were also smaller and easier to carry, making them more versatile, especially for firing from horseback.

Arrows also came in different types, but their basic design was simpler and changed little over time. Ancient arrows typically consisted of two parts: a light, slender shaft of wood or reed and an arrowhead of stone, bone, or metal. Arrowheads could be flat, leaf-shaped, or triangular and were sometimes barbed. They were attached to their shafts either by a hollow socket, into which

Turning Points

c. 10,000 B.C.E.	Bows and arrows appear as weapons in Neolithic cave paintings.
c. 2250 B.C.E.	A composite bow is depicted in Akkadian Stele of Naram-Sin.
c. 1600 B.C.E.	Chariot archers are increasingly used in warfare.
c. 400 B.C.E.	The development of the gastraphetes, or belly bow, allows the shooting of more powerful arrows.
53 B.C.E.	Parthian mounted archers defeat heavily armed Roman infantry at the Battle of Carrhae.
1346 C.E.	English longbowmen defeat French knights at Crécy, demonstrating the importance of archers to English warfare.
c. 14th-15th cent.	The increasing predominance of firearms in Europe results in the diminishing use of archers in warfare.



Kimberly L. Dawson Kurnizki

A simple bow, the joints bound with animal sinew, shown in both strung and unstrung positions. Also shown are barbed and leaf-shaped arrowheads.

the shaft was inserted, or by means of a tang, a flat projection that fit into a notch in the shaft itself. Feathers were frequently affixed to the opposite end of the shaft to maintain an arrow's speed and accuracy in flight.

Virtually all ancient civilizations, from China and the Near East to Greece and Rome, employed bows and arrows in some capacity. Archers were common in siege warfare, in which both attackers and defenders routinely harassed their opponents with volleys of arrows. Their use in battle, however, varied, seemingly along geographical lines. In Europe archers tended to be stationed on the wings, in front of, or behind a battle line of infantry or cavalry, and they tended to provide cover as these other forces prepared to engage the enemy at closer range. In the ancient Near East and Central Asia, however, bowmen on foot or horseback played a more decisive role in warfare; they made up the bulk of many armies and often determined the outcome of battle itself.

Development

As noted above, bows and arrows appear as weapons in cave paintings of the late Neolithic period (8,000 to 4,000 years ago), although their use in combat may be much older. Surprisingly, however, evidence for archers in the warfare of early civilizations is sparse. The Sumerian hero Gilgamesh carried, along with several other weapons, a bow in the Gilgamesh epic (c. 2000 B.C.E.; English translation, 1917), and the so-called Stele of Naram-Sin (c. 2250 B.C.E.) shows the Akkadian king Naram-Sin (c. 2254-c. 2218) carrying what appears to be a composite bow. The Egyptians may have been the first to employ archers on a large scale. By 2000 B.C.E. their armies included a corps of Nubian archers, who presumably supported native Egyptian infantry armed with spears and daggers.

The bow and arrow acquired more importance when they were combined with the war chariot.

Getty Images

A Manchu bowman circa 1871.

Chariots had been used as transport vehicles in Mesopotamia in the third millennium B.C.E., but by the sixteenth century B.C.E. they had become the preeminent weapon of war throughout the Near East and Egypt. The chariot functioned as a mobile firing platform, carrying a driver and archer armed with a composite bow. As the driver brought the chariot within range of opposing forces, the archer released his arrows, seeking to create confusion and disorder in the enemy line. In some armies archer-bearing chariots numbered in the thousands, and the union of bow, arrow, and chariot figured prominently at the Battles of Megiddo (1469 B.C.E.), between the Egyptians and a coalition of forces from the Levant, and Kadesh (1274 B.C.E.), between the Egyptians and the Hittites. The significance of the bow in the latter battle is reinforced by wall carvings; an Egyptian relief commemorating the battle shows the Pharaoh Ramses II (c. 1300-1213 B.C.E.) standing on his chariot and shooting his bow, seemingly mowing down the opposing Hittites single-handedly.

Chariot archers survived into the first millennium B.C.E. under the Assyrians, who dominated the Near East from the ninth through the seventh centuries B.C.E., but bows and arrows also found greater use in other units. Assyrian infantry consisted primarily of archers wearing heavy armor, who released their arrows under the protection of body-sized shields held by attendants. More significant, the Assyrians were instrumental in developing cavalry, including mounted archers. Like their counterparts on foot, Assyrian horse archers worked in pairs, as one rider shot his arrows while a second held the archer's reins and a shield. The combination of foot and horse archers was also adopted by the Persians, who became the preeminent power in the Near East in the sixth century B.C.E. Their tactics are well illustrated at the Battle of Plataea (479 B.C.E.) during the Greco-Persian Wars (499-448 B.C.E.). At the start of the battle, Persian cavalry harassed the Greek infantry with a constant onslaught of missiles, while refusing to engage the Greeks at close range. The Persian infantry soon followed with its own barrage of arrows, which were unleashed from behind a shield wall. The intention, it seems, was to weaken the Greeks with missile weapons, so that the infantry could emerge from behind its shield wall and overcome the remnants of the Greek infantry with the spears and daggers they also carried.

The heavily armed Greek spearmen, however, proved superior to the lightly armed Persian archers at Plataea, and the Greek victory in the Greco-Persian Wars signaled the end of the archer's prominence in Near Eastern and Western warfare for several centu-

ries. The Greeks were familiar with the bow and arrow; the Athenians had a contingent of archers at Plataea, and bowmen from the island of Crete were popular as mercenaries throughout the Mediterranean from the fifth century B.C.E. onward. Indeed, Alexander the Great (356-323 B.C.E.) utilized Cretan and Macedonian archers effectively throughout his conquest of the Persian Empire. The Greeks, however, despised the bow and arrow as cowardly and effeminate weapons, and archers generally played only a supporting role in combat.

The Romans, too, originally had little use for bows and arrows. They possessed no native archers of their own, and they relied on mercenaries or allies to supply archers when needed. Only as the nature of Rome's enemies changed in the first, second, and third centuries C.E. did archers take on an increasingly significant role in Rome's armies. Among these enemies were the Parthians, who in the second century B.C.E. had established an empire where the Persian Empire had once stood. The Parthians fought with composite bows on horseback and were best known for the so-called Parthian shot, in which Parthian horse archers would charge an enemy and, as soon as they released their arrows, would immediately reverse direction and ride quickly out of range of enemy missile fire. Such tactics proved highly successful at Carrhae (53 B.C.E.), where Parthian mounted archers annihilated seven Roman legions, approximately 40,000 men.

Developments in China mirrored those of the Near East and Europe. Archers on chariots were known as early as 1200 B.C.E., and they remained the elite weapon of war throughout most of the Zhou (Chou) Dynasty (1066-256 B.C.E.). Archers also served in Chinese infantry, but not until the fourth century B.C.E. did the Chinese begin to develop an effective cavalry. The incursions of nomadic horse archers from the steppes of Central Asia forced the Chinese to adopt their own mounted cavalry, which they did in the third, second, and first centuries B.C.E.

It was in the hands of nomadic peoples skilled in horsemanship that the bow and arrow achieved their greatest successes in warfare. Beginning in the seventh century B.C.E. the Iranian Plateau and Eurasian steppes produced several cultures whose movements threatened and sometimes overthrew the more sedentary civilizations of Europe, the Near East, and China. These peoples included the Scythians, Huns, Avars, and Turks, who shared with one another a life seemingly lived on horseback and a reliance on the composite bow. They wore little armor and were extremely mobile, and with their large numbers they could inflict heavy damage on an opposing force while avoiding direct contact against a more heavily armed foe. The most formidable of these horse archers were probably the Mongols, who emerged from Mongolia in the twelfth century C.E. Fighting on horseback and carrying one or more composite bows and sixty arrows, Mongol warriors were highly disciplined, and they used both mobility and deception to overwhelm their opponents. Under Mongol leader Genghis Khan (between 1155 and 1162-1227), Mongol armies swept across Asia and the Near East and into Europe. They established their own dynasty in China early in the thirteenth century, and by 1250 their empire stretched from Asia to Eastern Europe.

While Mongol horse archers were terrorizing Asia and Eastern Europe, the English were experimenting with the longbow, a development that changed the nature of Western warfare. Longbows had been known in Europe for centuries and had played no small role in the victory of William the Conqueror (c. 1028-1087) over the English at Hastings in 1066, but their role in battle was marginal until the English adopted the Welsh longbow in the twelfth century. Made from the wood of the yew tree, the Welsh longbow reached almost 6 feet in length and required considerable strength and skill to wield. It was also inexpensive, and, with training, common soldiers could learn to shoot with enough distance, speed, and power to penetrate even the thickest suits of knightly armor. Edward I (1239-1307) was the first English king to enlist large numbers of longbowmen (mostly Welshmen) in his armies, with whom he defeated the Scottish pikemen at Falkirk in 1298. During the fourteenth century, however, native English archers took up the longbow in greater numbers and proved their worth against heavily armored knights, especially during the Hundred Years' War against France (1337-1453). At Crécy (1346) the English

longbowmen first routed the mercenary Genoese crossbowmen before wreaking havoc on successive charges of French cavalry, killing more than one thousand knights by the end of the battle. Similar charges by armored knights on horseback at Poitiers (1356) and on foot at Agincourt (1415) brought similar results, and helped hasten the end of the dominance of mounted cavalry in European warfare.

The rise of gunpowder ultimately brought about the demise of the bow and arrow in battle. That demise, however, did not occur overnight, and for centuries after the introduction of gunpowder (c. 1300), archers remained an important component of most armies. Only with the development of effective and reliable handheld firearms in the sixteenth century did bows and arrows become obsolete.

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James P. Sickinger

Crossbows

Dates: To c. 1500 C.E.

Nature and Use

The crossbow was a handheld weapon consisting of a short bow made of either composite materials such as wood and horn, or iron, mounted on a stock, generally of wood. The bowstring was usually drawn by a type of mechanical device and fired by a trigger mechanism. The crossbow's missile, called a quarrel, or bolt, was short and heavy, designed to penetrate armor at close range. Various devices were employed to cock the bow, with its short limbs and heavy draw weight. The crossbow's power and short-range accuracy were counterbalanced by the length of time required to arm the weapon and its lack of range. Sometimes called arbalests, crossbows have been used as infantry weapons, and in heavier, more complicated versions as siege weapons.

Evidence points to the Chinese of the Shang Dynasty (1600-1066 B.C.E.) as the originators of the crossbow. Early missiles included stones and fire arrows. By the time of the Han Dynasty (206 B.C.E.-220 C.E.), crossbows had come into regular use among Chinese troops, particularly along the northwestern frontier. Soldiers stationed on the Great Wall could use the protection of the wall as they loaded and fired their bolts at invaders. Chinese crossbows featured bows of laminated bamboo, specially glued and covered with lacquered silk, which were fitted onto lacquered, wooden stocks. Chinese bolts were usually about 12 inches long with bronze heads capable of puncturing the quilted silk, padded leather, and metal armor of the era.

Another refinement was the repeating crossbow, fitted with a wooden, boxlike magazine holding from ten to twelve bolts and appearing in China in the first century C.E. The hinged magazine could be moved forward and back, thus serving as both a loading mechanism and a cocking device. Although the magazine increased the output of the archer, the magazine system was awkward and time consuming to reload. There is evidence, however, that types of magazine-fed crossbows were still in use during the First Sino-Japanese War (1894-1895).

Crossbows spread from Asia to Europe at some unspecified date. The Romans used large, complex versions of the crossbow as siege engines capable of firing heavy missiles against walled cities. In terms of infantry use, however, fragments of tombstone carvings from Le Puy and Polignac-sur-Loire in France dating roughly from the fourth century C.E. indicate that Roman legions may also have had crossbowmen using a basic model of laminated wood with a manual cocking arrangement. There is no evidence to show that the Romans employed the weapon on a broad scale.

Development

Although there have been allusions to the crossbow's use in fifth and sixth century England, the first Western written record of its use appears in a manuscript from 985 C.E. Derived from the Latin *arc*, or bow, and *ballista*, or missile thrower, the weapon became known as an *arcuballista*, or arbalest. Several eleventh century references note that William the Conqueror (c. 1028-1087) included crossbowmen in his Norman army, which invaded England in 1066. By the time of the Crusades of the eleventh through thirteenth centuries, crossbows had become a standard and valued part of European armies. Anna Comnena of Byzantium (1083-c. 1148) provided one of the most complete descriptions of Crusader crossbows, noting that soldiers had to strain with both arms to cock, or span, the bow.

Among the most proficient soldiers using crossbows were the Italians, particularly the Genoese. Hired as mercenaries by a variety of European

crowned heads, Italian crossbowmen were noted for their accuracy in battle. Simple soldiers could be trained in the use of the crossbow in a matter of weeks, whereas longbow archers required years of strengthening and practice to become expert. The use of the crossbow allowed a common soldier with minimal training to dispatch a well-armored, professional knight. So devastating had the crossbow become in conflicts raging across Europe that Pope Innocent II (died 1143), at the Lateran Council (1139), prohibited their use. The prohibition did not extend, however, to use against infidels, and even in Europe the ban was generally ignored.

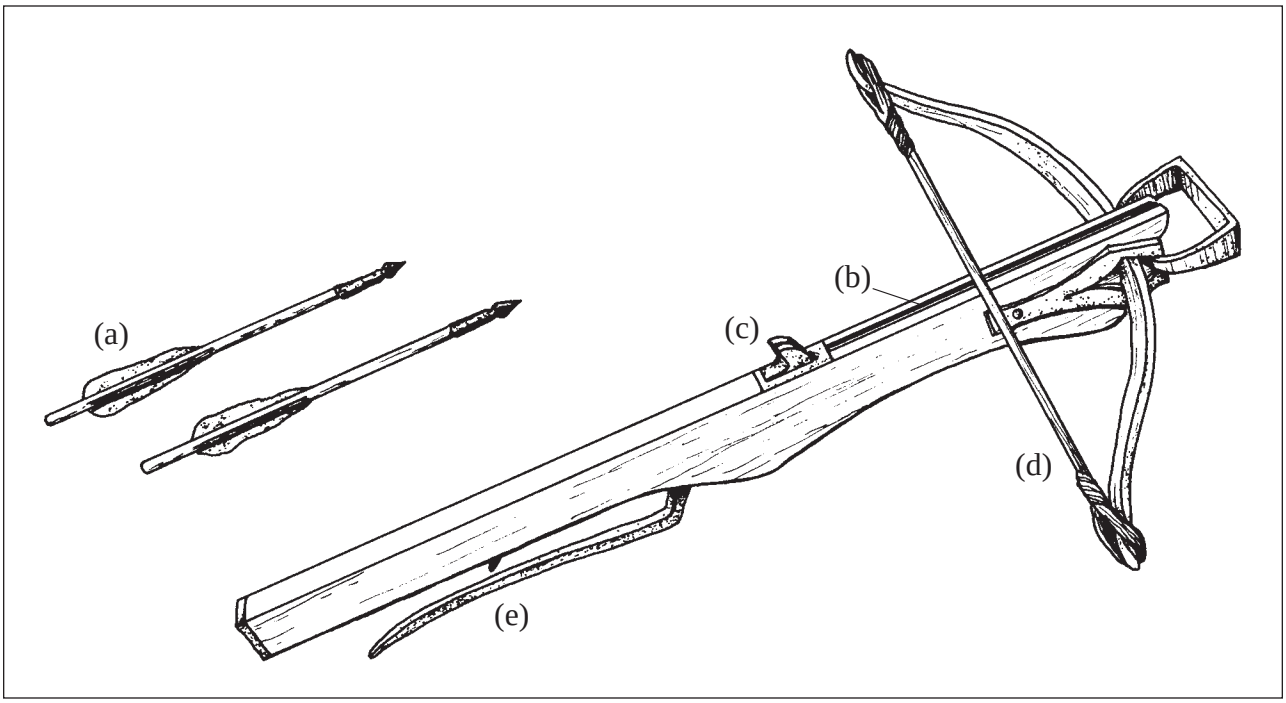
Although the crossbow had been used in the First (1095-1099) and Second Crusades (1145-1149), it had its greatest impact during the Third Crusade (1187-1192). King Richard I of England (1157-1199), a proponent of crossbow use and an accomplished marksman, was reported to have used the weapon to slay a Muslim archer high atop a wall during the Siege of Acre (1189-1191). In various skirmishes throughout the campaign, crossbowmen successfully defended supply routes and garrison posts. At the Battle of Arsuf (1191), Christian crossbowmen wreaked havoc against the lightly armored Muslim bowmen of the sultan Saladin (1138-1193). Muslim arrows did not easily penetrate the thick felt overcoats and mail shirts of the Europeans, whereas the short, heavy quarrels pierced the light armor of Muslim soldiers and horses. At Jaffa (1192) crossbowmen played a key part in Richard s victory over a numerically superior force. Later, after returning to England, Richard was mortally wounded by a crossbow quarrel while laying siege to the castle of Chalus, in the Limousin, France (1199).

The cocking mechanisms of crossbows went through a variety of developments during the Middle Ages. Although dates of innovations are unknown, evidence shows the weapon's evolution. As armor increased in strength, crossbows increased in power. The simple method of cocking, or spanning, by hand was replaced with both a stirruplike device at the head of the stock and a pair of belt hooks known as the "belt and claw." By placing the bowstring in the hooks, and the foot in the stirrup, sufficient leverage and power could be exerted to cock the weapon.

With the desire to increase range, even more radical spanning devices were needed. The *arbalest à tour* utilized a pulley system hooked to the string rather than the belt claws. By drawing on the pulleys, the string could be more easily cocked. In the fifteenth century, a "screw and handle" device consisting of a threaded rod hooked to the string and cranked at the rear of the stock by a handle, created a powerful weapon. The "goat's foot lever" employed hinged double levers, which bent the bow and cocked the string. This system was particularly efficient in the lighter-weight crossbows favored by European cavalry. A French innovation called the *cranequin*, or ratchet winder, utilized a handle connected to a pair of cogs enclosed in a drumlike attachment hooked to the string by a rail. By cranking the handle in a circular motion, the rail drew the string to the cocked position.

TURNING POINTS

c. 1384-1122 B.C.E.	Crossbow is originated during China's Shang Dynasty.
10th-11th cent. B.C.E.	The crossbow makes its first European appearance, in Italy.
c. 206-220 B.C.E.	Crossbows come into regular usage during China's Han Dynasty.
1139 C.E.	The use of the crossbow in Christian Europe is prohibited by Pope Innocent II at the Lateran Council.
1191	Christian crossbowmen are instrumental in defeating Muslim warriors at the Battle of Arsuf during the Third Crusade.
1415	English longbowmen prove more effective than Genoese mercenary crossbowmen hired by the French at the Battle of Agincourt during the Hundred Years War.
c. 16th-17th cent.	Use of crossbows diminishes as firearms become more common.



Kimberly L. Dawson Kurnizki

A crossbow shown with two quarrels, or bolts (a), which are fitted into the groove (b), with their butt ends against the nut (c) after the bowstring (d) has been drawn back and held by the nut. When ready to fire, the operator aims from the shoulder and presses the trigger (e) to release the bolt.

Each time a cranequin was used, however, it had to be removed in order to fire the crossbow and then reattached for reloading. Such a device was especially necessary as laminated bows were replaced with stiffer, more powerful metal limbs.

Perhaps the most complicated version of crossbow mechanisms was the windlass, or *moulinet*, system. A combination of fixed and free pulleys was attached to the stock of the bow, and the free-running pulleys hooked to the string. By inserting a foot into the stirrup to stabilize the weapon, crossbowmen would then crank a pair of handles engaging a windlass to wind the fixed pulleys. This marriage of pulleys and handles could span even the heaviest of crossbows used in besieging castles and other fortifications. As with the cranequin, however, the moulinet system had to be removed to shoot, thus creating a slow rate of fire.

As crossbows evolved, so too did quarrels. Wooden shafts fitted with iron heads remained the standard missile for centuries. Quarrels were usually from 9 to 12 inches long. To stabilize the quarrel in flight, fletchings of wood, leather, or feathers were used, although these were much shorter and shallower vanes than those of longbow arrows. With the development of mechanical spanning devices, all-metal bolts became the most lethal of projectiles, particularly when used on heavier crossbows.

In English and continental European armies, crossbowmen were generally placed in the front line of battle to pepper foes with their bolts. At the Battle of Taillebourg (1242), England's King Henry III (1207-1272) was defeated by French king Louis IX (1214-1270) even though the English counted some 700 crossbowmen in the infantry. During the Hundred Years' War (1337-1453), Genoese crossbowmen in the employ of the French dueled English longbow archers at Crécy (1346) and Agincourt (1415). In both engagements, the longbowmen prevailed with their greater range and accuracy.

Corps of crossbowmen were included in most Eu-

ropean armies into the sixteenth century. At the Battle of Marignano (1515), a bodyguard of two hundred mounted crossbowmen helped Francis I (1494-1547) of France defeat the duke of Milan. When Spanish adventurer Hernán Cortés (1485-1547) trekked into Mexico (1521), he brought with him a company of arbalesters, as did Francisco Pizarro (c. 1478-1541) in his invasion of Peru (1524). As late as 1570, Spanish marines stationed aboard galleons were still armed with crossbows.

With the advent of gunpowder and handguns, the military use of the crossbow dwindled. By the seventeenth century, it had primarily become a tool for hunting and target practice. During World War I (1914-1918), medieval crossbows were stripped from armories and converted into grenade launchers for use in the trenches. More recently, some modern military special forces have adopted crossbow use for clandestine operations.

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Kenneth P. Czech

Knives, Swords, and Daggers

Dates: To c. 1500 C.E.

Nature and Use

Almost every human culture and civilization in the world has used knives and daggers. A knife is one of the most basic tools, used for cutting any number of materials, from food to fibers. Knives were also used as weapons to kill humans. A dagger could be considered a long, double-edged knife, ranging from 15 to 50 centimeters and meant specifically as a weapon. Knives and daggers have two basic parts: first, the blade, a flat surface with one sharp edge or two, usually narrowing to a point; second, the hilt, covering the tang, which extends back from the blade, and providing a handhold. The hilt itself has two parts: the grip, perhaps with some sort of guard to protect the hand, and a pommel, which is a piece at the end of the grip to back up the hand and provide balance. For protection from the sharp blade, knives were carried in sheaths or scabbards while not in use.

Some knives were meant to be thrown. Otherwise knives and daggers were usually wielded either overhanded, with the blade extending down from the fist, or underhanded, with the blade sticking up from the fist. These weapons also had the advantage of concealment when worn underneath clothing. In the warfare of all but the most primitive societies, the knife or dagger was usually the weapon of last resort, after other weapons had been lost.

Most cultures have also developed swords, which could be considered extended daggers, with blades longer than 40 centimeters. Swords could, given their weight and length, more effectively hack, slash, puncture, or cut an enemy. Grooves in blades, or fullers, are often believed to have been channels to drain away blood but were usually built into the blade to add flexibility, lightness, and strength. The limited reach of the sword, compared to that of the spear or bow, often meant that it was a secondary weapon. Although rarely decisive in itself during battle, the sword was one of the most widely used weapons for close combat before 1500 C.E.

The history of knives, daggers, and swords has perhaps been more influenced by fashion than by application in warfare. These weapons and their sheaths have often been made with great care and decoration, conveying the status of their owners. The sword, especially, became a work of art, status symbol, magisterial emblem, and cult object. The right of knights or samurai to wear swords indicated their social positions, and men defended that rank in sword duels. In medieval Europe a squire was dubbed to knighthood with a sword blow, known as an accolade. Large ceremonial swords of state were carried in processions or displayed in court to illustrate a ruler's power over life and death. Swords or daggers also embodied religious significance, such as sacrificial daggers made of chalcedony used by the Aztecs for human sacrifice. The similarity of a sword's shape to that of a cross also lent it a Christian symbolism. Legends concerning Arthur's Excalibur and Roland's Durandal celebrated the sword in Europe, and many Japanese believed that certain old swords embody the spirits of Shinto deities.

Development

The earliest humans made the first knives and daggers from stone, such as flint or obsidian. They shaped blades through "pressure flaking," banging pieces of stone against one another so that chips of stone broken off would leave a blade form behind. By the time of the agricultural cultures of the New Stone Age (Neolithic times), a grip made of wood or bone was then formed and attached with lime or binding to the tang. The peoples of the Americas and the Pacific rarely progressed beyond stone technology, and so did not develop significant swords. The Aztecs, how-

ever, may have been able to dominate their neighbors in the thirteenth century C.E. with the interesting sword-club, the *maquahuitl*, which set obsidian blades on either side of a wooden shaft. They also used special stone knives to cut out the hearts of human sacrificial victims.

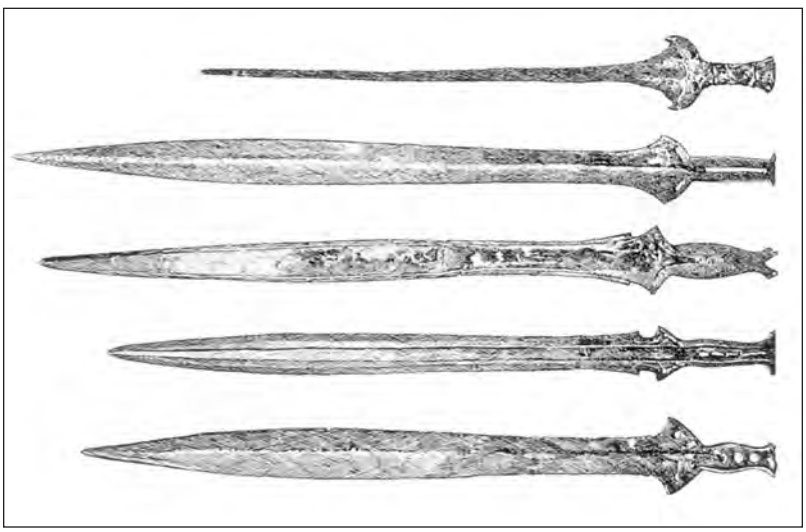
The essential change came with the beginnings of metallurgy. Copper was the first metal to be used for knives, probably beginning around 4000 B.C.E. in the Middle East and East Asia. The invention of bronze, usually copper alloyed with tin, led to a great improvement in the strength and durability of weapons. In "grip-tongue" blades, whether cast in one piece or two, hilts were attached to the blade or reinforced with rivets. By the second millennium B.C.E. hilt and blade were forged from one piece of metal, with flanges between hilt and blade to protect the user's hand.

As blades began to get longer, the resulting weapons became known as swords. Some were curved, based on the sickle, an agricultural implement used for harvesting. Curved blades were better suited to cutting, whereas straight blades were better at hacking and thrusting. The Minoans and Mycenaeans of the Eastern Mediterranean from about 1400 to 1200 B.C.E. began to develop not only decorative long swords but also highly useful short swords. The curious "halberd" of the Early Bronze Age looked like a dagger set at right angles to a shaft, creating a kind of dagger-ax.

Swords became more lethal after smiths had mastered the use of iron, beginning around 900 B.C.E. Instead of being cast from liquid metal, iron weapons were beaten out of ingots heated in forges. Because the hardness of ancient iron varied considerably, a key development toward improving the swords was pattern welding, which was the combining or plaiting together of different strips of iron into formations or patterns. This technique blended the weaker and stronger parts of the iron into a more uniformly strong and flexible blade. Although ancient smiths might not have understood the scientific basis of making steel, iron hardened with carbon, many sword-makers developed techniques that guaranteed its use in the sword.

With the Iron Age, the sword became a standard, if not always decisive, weapon. In the Greeks' phalanx method of combat, the opposing formations of spear and shield were most important, but swords were used in close combat, often as a desperate measure. The hoplite sword, intended mainly for slashing, had a wide bulge about one-third of the way down from the point, narrowing to a waist until widening at the hilt again. Some Greeks also used a *kopis*, a heavy, single-edged, downward-curved sword.

The Roman legions made their short "Spanish" sword, the *gladius hispaniensis*, a more essential part of their fighting system. After weakening the enemy with thrown spears, they closed and smashed their large shields against their opponents. Then, while the enemy usually used an overhand sword blow, caught by the Roman shield, the Roman legionary would thrust his short, stabbing sword underneath into the stomach, where its long point could penetrate most linked armor. The Romans also carried fine daggers, but they seem not to have been used in battle. By the time of the early empire, the in-



North Wind Picture Archives via AP Images

A collection of Bronze Age Celtic swords.

fantry preferred the short, hacking, "Pompeian" sword. Beginning in the second century C.E., with the rise of cavalry, a more suitable, longer (80-centimeter), slashing sword, the *spatha*, began to dominate in the Roman armies. This sword was the ancestor of medieval European swords.

The Roman Empire was brought down by Germanic peoples using long swords. Through the early Middle Ages, the sword became the basic weapon of a warrior. Battle would often begin with a charge, on foot or on horseback, using spears or lances. Once those weapons were spent, however, the warriors would hack at their armored foes with swords. Axes and maces were also popular, as well as the *seax*, a heavy, single-edged, broad-bladed chopping sword which had evolved by 900 into the *scramasax*, a short chopping blade. With the rise of knighthood by the eleventh century, warfare with lances and swords allowed Europeans to push back their opponents in the Crusades. After armorers developed better armor to help knights survive in battle, swordsmiths devised blades that would break through metal. The falchion, a broad-bladed, cleaverlike sword addressed that need. Thirteenth century knights also began to use heavier and longer one-and-one-half-handed ("bastard") or two-handed swords. By 1500 infantry, especially the Swiss and German *Landsknechte*, had developed huge swords, up to 175 centimeters long.

Another solution to European plate armor was to emphasize the swords' thrusting ability. The blade became thicker and more rigid, so the user could pierce weaker joints in the armor. In order to improve grips on such swords, protective rings began to be added to the cross-guard. Guards became more elaborate, including a curved bar stretching from cross-guard back to pommel, while the blade became narrower and sharper at the point. Thus the modern rapier appeared, which began to dominate after 1500.

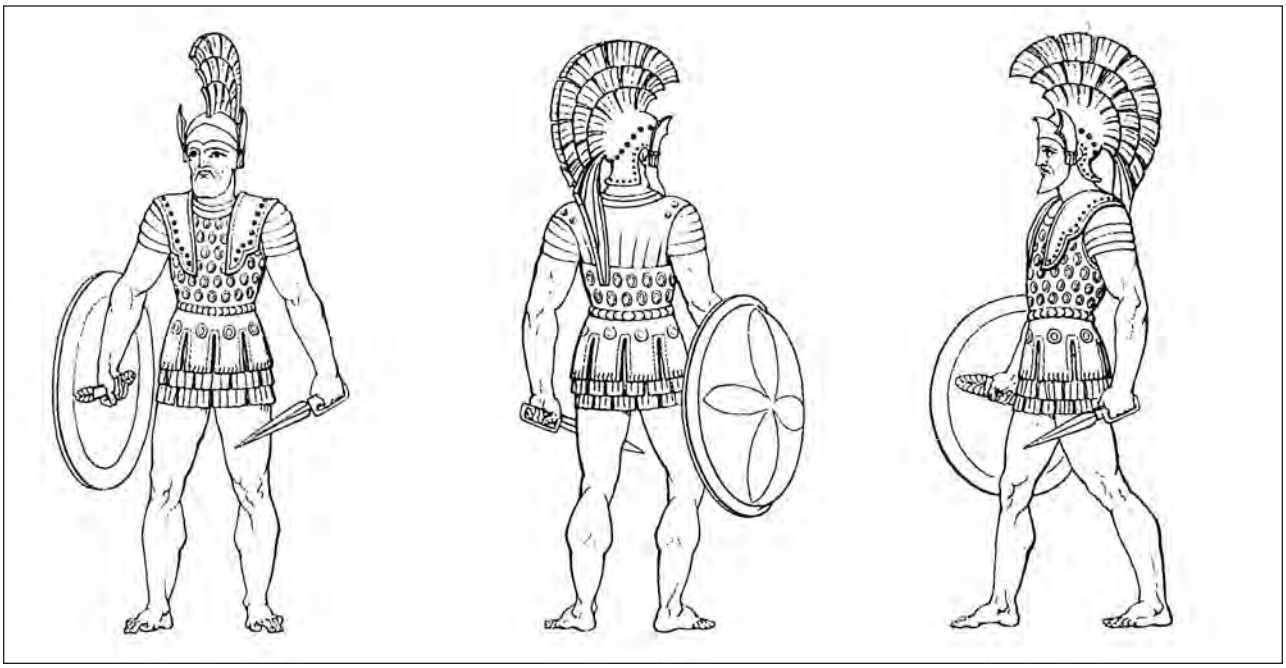
Daggers were worn by European warriors throughout the Middle Ages. Daggers played only a minor role in combat, with one exception: Should a knight through exhaustion or wound be found on the ground, his enemy might dispatch him with a "misericord" dagger thrust through a chink in the armor. The popular late-medieval *baselard* and *rondel* daggers with their long, narrow blades were used for this purpose. The former had a curved cross-guard and pommel, whereas the latter had a disk-shaped guard and pommel. The rondel dagger also evolved into the Scottish dirk.

Sub-Saharan Africa was not using bronze weapons by the Bronze Age and began to use iron by the third century B.C.E. By the fourth century C.E., the use of iron tools and weapons had spread throughout the continent. A shortage of iron, however, meant that sub-Saharan peoples had to import many weapons from European and Islamic civilizations. In some cultures, the Kuba kingdom of the Congo, for instance, daggers and swords with unusual blade shapes acquired great cultural importance. Africans also developed a unique throwing knife, the *hunga-munga*, with several blades branching out at angles from a main shaft.

Islamic swords, whether Arab, Turk, Persian, or Indian, were often typified by the scimitar, a curved, single-edged blade meant for slashing, which developed in the eighth or ninth century C.E. Scimitars predominated by 1400 C.E. but never entirely replaced straight blades. Until the fifteenth century the city of Damascus not only made famous swords but also served as a trading center for weapons made else-

TURNING POINTS

4000 B.C.E.	Copper is used to make the first metal knives, in Middle East and Asia.
2000 B.C.E.	First metal swords, made from bronze, appear.
900 B.C.E.	Smiths master the use of iron to make stronger, more lethal, swords.
100 C.E.	With the increasing use of cavalry in Roman warfare, the *spatha*, a longer, slashing sword becomes popular.
1300	Japanese craftsmen perfect the art of swordmaking, creating the *katana*, a curved sword used by samurai warriors.
1500	As European plate armor becomes more prevalent, the sharp, narrow rapier is developed to combat it.



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Etruscan warriors in uniform, armed with short swords and carrying shields for protection.

where. Persian weapons were famous for "watered" steel, in which the combination of higher and lower carbon content created a wavy pattern in the blade visible after an acid wash. Islamic dagger shapes varied widely according to region, although the *jambiya*, or curved ceremonial dagger, is most famous. Persian and Indian versions have a double curve. Interesting daggers from India included the Gurkha's *kukri*, with a downward-curved, single-edged, leaf-shaped blade, and the *katar*, or punch dagger. The unusual Malayan kris had a blade that could be wavy and widened from the point to a thick wedge at the hilt, which itself was set at an angle down from the blade. Throughout Southeast Asia, machetes, or parangs, were used as jungle knives for both clearing vegetation and fighting.

In China, straight bronze swords of various lengths dominated until the establishment of the Chinese Empire in the third century B.C.E. Iron weapons were then introduced, which led to long (90-centimeter) straight swords. Cavalry, charioteers, and infantry all used swords, although an important side weapon was also the dagger-ax. The scimitar-like cavalry sword, probably introduced by Turkish peoples of Central Asia, became more popular after the eighth century C.E.

The high point of sword-making skill lay in Japan. Japanese swords were made with a highly sophisticated folding of metals: millions of times for the cutting edge, mere thousands for the spine. With polished blades and decorative hilt fittings, Japanese blades were unsurpassed in both beauty and lethality. The earliest swords in Japan, around 700 C.E., were based on straight Chinese blades. During the Heian period (794-1185 C.E.) the blades of the long *tachi* used by samurai horse warriors began to be curved. These types of swords were perfected in Japan during the late eighth and early ninth centuries. Although the primary weapon of the samurai was originally the bow, failed attempts by the Mongols to invade Japan in 1274 and 1283 C.E. led to a new emphasis on the sword in combat. In the fourteenth century the Soshu tradition of sword making was founded, creating the curved sword that became the *katana*. By the fifteenth century, the samurai warrior class had the sole right to carry swords, normally both the long sword,

the katana, and the short sword, the *wakizashi*. The Japanese also had equally fine knives, ranging from the dagger, or *tanto*, carried with the swords, to smaller blades that fit into the scabbards of other weapons. Knives had various uses: as a replacement for chopsticks, for throwing at an enemy, for committing ritual suicide, or for giving the coup de grâce to an opponent.

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Brian A. Pavlac

Spears and Pole Arms

Dates: To c. 1500 C.E.

Nature and Use

The spear is among the simplest and most universal of early weapons: a simple penetrating point secured to a shaft that adds either aerodynamic qualities or leverage and distance from the target. Evidence for the manufacture and use of such weapons exists among every major population group in the world and stretches back to Paleolithic times. A basic spear consists of a long shaft of wood, bamboo, or iron with a sharpened head or point attached to one end. If the head is long and provided with a sharpened edge, the spear may be used as a slashing weapon. However, most spears were designed either to be hurled, as were javelins, or to be used as thrusting weapons held in one or both hands.

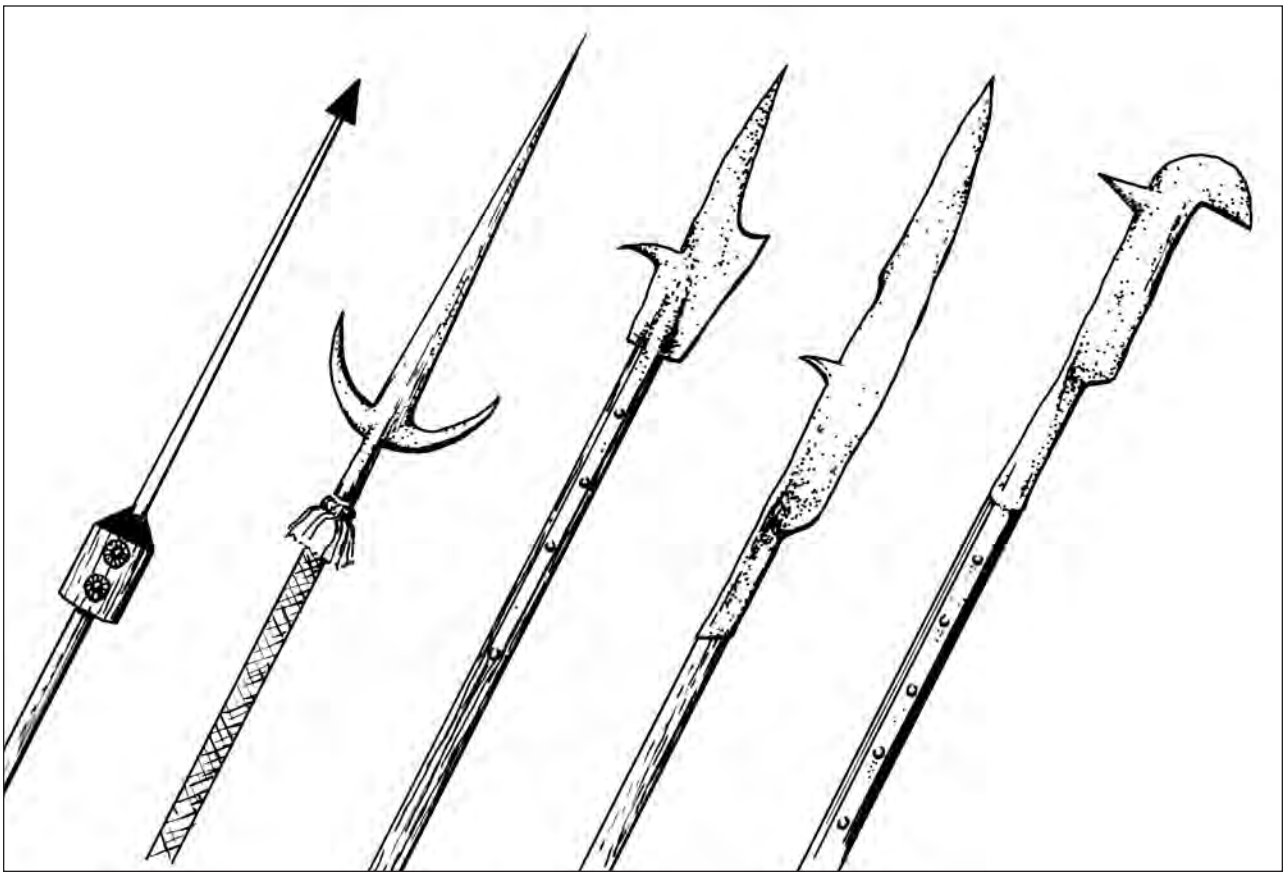
Used by infantry against other infantry or cavalry, pole arms encompass a range of weapons consisting of a long, sturdy pole, or haft, with a pointed, hooked, or edged blade attached to one end. The heads of these weapons—consisting of the blades plus the sockets and side braces used for attachment—varied in length and complexity. Hellenistic sarissas (*sarissophoroi*) and late medieval pikes were fairly simple iron spear points at the ends of 16- to 18-foot poles. Medieval and early modern halberds were complex combinations of thrusting points, blades, and hooks used to unseat horsemen. Some scholars categorize any thrusting spear as a pole arm, while others define pole arms as having specifically evolved during the Middle Ages from agricultural implements such as pruning hooks, axes, forks, and hammers. The widest variety of these latter weapons is to be found in the European and Mediterranean regions and in Japan.

Development

Early humans created the first spears by sharpening and later hardening in fire the ends of long, straight, wooden shafts. At some time people began to attach pointed heads of sharpened bone or flaked flint by notching the shaft end, inserting the flange, or tang, on the head behind the point, and lashing the two together. Javelins had light shafts and triangular or even barbed heads that helped the weapon remain in its victim. Prehistoric Europeans as well as peoples of the Americas, Oceania, and Asia also developed spear-throwers, which were short handles of carved horn, wood, or ivory cupped at one end. The cup held the butt of the shaft, and the handle acted as a lever or rigid sling that hurled the spear with greater accuracy and force than could an unaided human arm. Thrusting spears developed longer, leaf-shaped heads that could be more easily withdrawn after penetration.

Copper, and later bronze, spearheads first appeared in Mesopotamia and were used along with stone spearheads. Beaten or cast metal allowed for the creation of sockets behind the heads. These sockets could be as long as 2 feet, making for a more secure attachment than lashed tangs and reducing the likelihood of the shaft breaking. The heroes of Homer's epics the *Iliad* (c. 750 B.C.E.; English translation, 1611) and the *Odyssey* (c. 725 B.C.E.; English translation, 1614) fought their individual combats with two javelins with 6-inch heads, as well as stout 10-foot olive-wood spears with sharpened butts and 2-foot bronze heads with straight, rather than leaf-shaped, edges and a prominent median ridge running back from the tip.

Iron heads emerged in tenth century B.C.E. Greece and among the Celts of the Hallstatt culture (c. 700 B.C.E.). The latter created leaf-shaped heads with short wings, or lugs, at the base of the point to prevent overly deep penetration—perhaps a development from hunting practice. Later La Tène-era (c. 500-50 B.C.E.) graves contained heads that display a wide variety of shapes and sizes, including triangular, wavy-edged, and leaf-shaped. Celtic charioteers hurled



Kimberly L. Dawson Kurnizki

From left to right, a pilum, *with a leaf-shaped tip and an iron neck weakened to break on impact; a* corseque, *with a triangular blade and wings; a* halberd, *displaying a characteristically complex combination of thrusting points, blades, and hooks for unseating horsemen; a* glaive, *with a spike and a long, gently curving blade, like that of a knife or single-edged sword; and a* bill, *with a broad outward-curving blade for cutting or grabbing horsemen.*

iron-tipped javelins, as did eastern Mediterranean light infantry, or *akonistai*, at the beginning of Greece's classical period. Fifth century B.C.E. Greek hoplites, or infantry soldiers, fought with stout 9-foot spears in phalanxes several men deep. Vulnerable Persian infantry armed with shorter spears had to rely on archers. The armies of Alexander the Great, king of Macedonia from 336 to 323 B.C.E., and his successors also relied on phalanxes of spear-throwers in ranks of up to five men deep with ash-shafted sarissas of up to 21 feet in length. Some Hellenistic cavalry also used sarissas, while others wielded shorter spears for under- or overhand thrusting. The Roman victory at Pydna (168 B.C.E.) ended the dominance of the sarissa.

The standard Roman javelin was the *pilum*. One third of its 5.5-foot length was a long iron neck with a leaf-shaped tip. To prevent the pilum from being hurled back, its wooden socket was weakened to break upon impact. Later, under Julius Caesar (100-44 B.C.E.), the iron neck was weakened so that it would bend after penetration and render the enemy's shield useless. From either the Sabines or the Celt-Iberians, the Romans borrowed the *verutum*, a curved-bladed javelin thrown with a leather sling, or *amentum*, that wrapped around the shaft. The verutum

largely replaced the pilum in the second century C.E. The *falarica*, or Saguntine spear, was a javelin with a foot-long head of triangular section; balls of fiber soaked in pitch could be attached and ignited to make an incendiary missile.

In Asia, Tibetans wielded the *dung*, a spear 7 to 10 feet in length with a long, narrow, two-edged head on a socket. The shaft was often wrapped with iron bands, tipped at the butt end with an iron cap, and was used by cavalrymen for vaulting into the saddle. Japanese armies carried several types of pole weapons, beginning with the *take-yari* or *take-hoko* a 6.5- to 8-foot bamboo pole tipped with a simple jagged edge. The traditional *yari* usually had long tangs that attached either triangular or diamond-sectioned tips with pegs and metal collars, called *habaki*. Some heads were as long as short swords, and spear-fencing emerged as a respected martial art. Wings, hooks, and curved blades eventually were added, as in the forked or crescent-headed *sasumata* or the cross-shaped *maga-yari*. Other Japanese pole arms included the *ono*, a poleax with a hammer or peen opposite the blade, and the *kama-yari*, with a picklike head. Hafts were usually of wood, lacquered or plain, and sometimes wrapped in silk thread.

In Africa, native and Arab warriors hurled the 4-foot-long *assagai* or *zaghaya*, with a long, barbed lancet head whose tang was lashed to a wood or bamboo shaft. At lengths of up to 36 inches, the shorter javelin known as the *jarid*, or *djerid*, with its square-sectioned steel head was used in most Islamic-dominated areas.

In medieval Europe the use of the spear continued while other pole arms were developed. Frankish warriors borrowed the Roman pilum (*angon*), barbing the tip and sheathing nearly the entire shaft in iron. Frankish thrusting spears had leaf-shaped tips with short lugs or wings at the base. Scandinavians used a variety of spears, including those designed for slashing (*hoggspjot*), hurling (*gaflak*), and flinging with an amentum (*snoeris-spjot*). They also employed thrusting weapons with long spikes. Hundreds of iron heads with bronze or gold inlay and ashwood shafts of 6.5 to 11 feet have been found in Danish graves. Norse warriors often named their weapons, usually incorporating serpent imagery. European infantry continued to use thick-shafted spears tipped with lugged, leaf-shaped, or triangular heads until well after 1500 C.E.

Stirrups and deep-welled saddles allowed cavalry to wield spears more effectively in both over- and underhand motions, as shown in images such as the Bayeux tapestry (c. 1080 C.E.), which depicts the Norman Conquest. The lance developed as a shock weapon couched close to the body for charging other cavalry. Roman and early Byzantine *cataphracts* lashed their long spears against their horses' necks, supporting the butt by a rope sling at the croup. In the high Middle Ages, the 9- to 11-foot-long shaft had uniform thickness and a small, leaf-shaped tip. Tournament jousters used a three-pronged tip, or *cronel*, designed to grab, rather than to penetrate, the opponent's shield or armor. Hilts were added in the fourteenth century to absorb recoil upon impact, and conical vamplates that also served to deflect the enemy's lance tip appeared in the fifteenth century. Jousting shafts composed of bundles of thin staves (*bourdonass*) designed to shatter upon impact replaced those of solid wood, and plate breast armor sported small brackets, called arrests, that cradled the butt of the knight's lance.

Infantry spears evolved in two directions after about 1200 C.E. On one hand, the sarissa emerged again as the pike, with its small diamond-sectioned head at the end of a 12- to 18-foot-long ash shaft. Phalanxes or squares of up to four effective men deep could withstand the most determined cavalry charge with their leveled weapons, as at Courtrai (1302 C.E.) and Bannockburn (1314 C.E.), but archers easily decimated the unprotected ranks at Falkirk (1298 C.E.). Nonetheless, armies of pikemen proved successful until effective firepower broke their ranks, as at Bicocca in 1522 C.E.

On the other hand, spears with short wings or lugs evolved into more complex thrusting weapons as the tips lengthened and the wings arced out from the base. The *langue-de-bœuf* (ox tongue) began as a long, two-edged blade with a short socket and no wings; in the fifteenth century wings were added, and the resulting weapon became known as the partisan. The Italian *corseque*, with a broad, triangular blade and generally longer wings evolved similarly. The

wide, flat surfaces of the corseque served Renaissance decorators well, and the weapon ended up as the ceremonial weapon of bodyguards.

Although ancient Egyptians had fought with axlike blades attached to long poles, most slashing pole arms evolved from the agricultural implements that European peasants used to defend themselves against mounted warriors. The English bill, designed for pruning, consisted of a long and broad cleaverlike blade that curved outward at the top. It could strike downward or horizontally, and the hooked top could cut or grab mounted men. Iron sleeves that protected the shaft from blows gradually evolved, as did the blade's design. The fully developed bill of the fourteenth century sported a long, curved fluke on the backside, a pointed thrusting blade on the top, hooked and sharpened lugs at the base, and a peen or spike that projected perpendicularly from the haft, or pole. The top blade or spike could penetrate breastplates and the peen could penetrate helmets, while the fluke could hook and pull knights from horses or trip foot soldiers. The French *guisarme* retained more of the early bill's cutting edge, while the symmetrical Italian double-bill resembled a fleur-de-lis mounted on a long, broad leaf-shaped cutting blade.

Axes came with short or long hafts, and long hafts were favorites with the Norse, Russians, and Anglo-Saxons. Poleaxes developed in the later Middle Ages and were surmounted by long, straight, or curved Danish ax-heads, perhaps with rear-projecting flukes. When a thrusting point was added, in approximately 1300, a proper halberd was born. Swiss halberdiers slaughtered Austrian troops at Hildisrieden and at Sempach in 1386 and at Näfels in 1388, and later became the Pope's bodyguards. Various combinations of flukes, points, and blades often make differentiating between bills and halberds difficult, but the halberd is generally distinguishable by its salient convex ax-blade. The glaive, or broadsword, evolved during the fifteenth century from the long-hafted scythe, with its long, gently curving blade. The concave edge was inverted to convex, like that of a knife or single-edged sword, and spikes or flukes were added to the back of the blade. The *fauchard*, with its distinctive crescent fluke, derives from the glaive. The practical value of these weapons declined after the late fifteenth century, and bills, halberds, and glaives became highly decorated ceremonial weapons.

Other farm implements, including hammers, flails, and forks, were also mounted on poles for military use. Pole hammers might also sport hooked flukes or long spikes, whereas military forks with two tines were sometimes supplied with blades or hooks. Spiked maces with long hafts and even spiked balls with one long spike extending as a thrusting point also appeared on late medieval battlefields.

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Joseph P. Byrne

Chariots

Dates: To c. 400 B.C.E.

Nature and Use

The chariot derived from the four-wheeled wagon, and was replaced by a two-wheeled vehicle after the original wagon was found to be too cumbersome for combat. While the precise origin of the chariot remains unknown, it is known that the Hyksos, of Semitic origin (c. 1700 B.C.E.), introduced the horse-drawn chariot during invasions of Egypt (c. 1674 B.C.E.). Hammurabi, ruler of the Amorite Dynasty (c. 1750 B.C.E.) in Mesopotamia, was driven from the Near Eastern sphere of power when conquered by the Hittites, a people from the northern mountain regions of modern Iran and Iraq whose spearmen fought from chariots. In Asia Shang Dynasty (1384-1122 B.C.E.) armies introduced the chariot to northern China in order to overrun the earlier Chou (Zhou) Dynasty (1122-221 B.C.E.).

The rapid development of the chariot, the breeding of horses, and the ability to control them with a bridle and bit allowed for efficient use of the chariot in battle. Chariots drawn by horses were yoked horizontally in pairs. Two wooden, Y-shaped forms attached to the yoke were fitted to the horses but limited the terrain over which they could be used effectively for battle. As chariot use increased, so did the need for professional charioteers and chariot-warrior teams, each consisting of a driver and an archer. The Hittites were credited with the expansion of the chariot crew to include a third man, the guard or shield bearer. The Hittites also used the chariot defensively against enemies. Reconstructions of early chariots found primarily in Egyptian tombs of New Kingdom (c. 1550 B.C.E.) kings reveal a hard, dense wood used to prevent cracking of the hub, an inflexible wood for the spokes, and a flexible wood for the wheel rim, or segments of the wheel rim, called fellies.

Initially, the chariot provided armies with speed and thus the potential for surprise attacks. This new form of attack forced military leaders to adopt new battle tactics. When integrated into the battlefield, the maneuverability of the chariot allowed the chariot-warrior to perform an outflanking maneuver. In early use, archers were able to use the chariot as a mobile platform from which to shoot. The mobility increased the damage inflicted on enemy troops and enabled chariot soldiers to chase down fleeing enemy soldiers.

In the Near East, the chariot became an effective offensive weapon. Often more disruptive than destructive, aggressively mobile chariot forces could gain control over the east-west and north-south trade routes to the sea, as well as inland access to natural resources, eliminating the need to mount an expensive army campaign.

Treaties formed with opposing enemies combining a large kingdom and vassal-states within one area of influence illustrate the important role chariots played in the history of the Near East. Even the show of force by aggressive chariot tactics helped to dissuade confederations in opposition.

Egyptian tomb paintings (c. 1700 B.C.E.) depicting the design and manufacture of early chariots show a vehicle with four-spoked wheels and a single axle centered under a single platform, on which the chariot driver stood directly over the axle. The light weight of wooden chariots provided Egyptians with needed mobility in battle. At approximately 1300 B.C.E., two changes in chariot design were made. The first innovation was an increase in the number of spokes, from four to six, in order to sustain a heavier weight on the wheels. The second was the relocation of the axle from the center of the chassis to the edge of the platform, which was open at the end of the chassis.

Early chariot tactics were immediate and intrusive; the charioteers would rapidly advance and encircle the enemy at a distance of approximately 100

TURNING POINTS

c. 1674 B.C.E.	The Hyksos people introduce the horse-drawn chariot during invasions of Egypt.
c. 1300 B.C.E.	Chariot design undergoes major innovations, with an increase in the number of spokes and the relocation of axles.
c. 1122 B.C.E.	Shang Dynasty armies introduce the chariot to northern China in warfare against the Chou Dynasty.
c. 546 B.C.E.	Persian king Cyrus the Great uses chariots to great advantage at the Battle of Thymbra.
c. 401 B.C.E.	Charioteers are overwhelmed by more flexible cavalry in the Battle of Cunaxa, ending the dominance of chariots in warfare.

yards and then use the chariot as a mobile platform from which the archer would shoot. This method permitted both speed and a greater ability to maneuver on the battlefield than had war wagons or troops on foot. The result left an enemy defenseless to form a counterattack.

In a two-wheeled, four-spoked Greek chariot, there was a chariot-warrior group of two: the driver and the archer. The two-wheeled Greek chariot did not provide an archer with protective cover, and no spear-throwing could be accommodated in the two-wheeled chassis, or in the battle strategy, without bringing the chariot to a stop. The open-framed chassis had bentwood rods with leather sheets stretched between them. These light chariots allowed for side screens but required the attachment of metal plates for protective purposes. The characteristically curved draught-pole, connecting the yoke to the chassis, was supported at the yoke end by a leather swathe and then continued back to the protective chassis screen.

DEVELOPMENT

The component parts of the chariot—wheels, draught-pole and yoke, chassis, and fittings for harnessing—developed independently in different regions. Wheels were made either as a single unit or as segments of smaller pieces of wood, often fastened together with leather. The spoke wheel derived from the earlier three-part wheel. Implementation of the hub permitted a lighter-weight chariot with the spoke used to disperse the weight density. Spoke wheels were more expensive to produce than were the earlier three-part wheels, and their production demanded a higher level of technology, as well as a skilled work force. The finished wheel consisted of a hub to hold the axle, as well as sockets for each spoke end.

To lessen the stress of the chariot's dispersed weight, spokes were of precisely equal lengths. The spoke was trimmed to fit, like a dowel, into the hub holes and wheel rims. Egyptian spokes were carved separately to fit the hub hold and were connected by mortise-and-tenon joints borrowed from Old Kingdom furniture-making techniques. Bent wood, in either single pieces or segments, heated to form the circular shape, was used for the wheels. In Bohemia, the Rhineland, and possibly India, the spoke was held together with overlapping metal strips wrapped to envelop the join. In Shang Dynasty China (1384-1122 B.C.E.), chariots utilized a spoke wheel. Both six- and eight-spoked wheels were used in the Near East (c. 1900 B.C.E.), and the six-spoked wheel was standard for Hittite- and Syrian-designed chariots (c. 1400 B.C.E.).

Unlike Egyptian chariots, the Greek light chariot rotated on a fixed axle held by a metal linchpin. Iron linchpins coated with bronze were used in the Celtic chariot. The Greeks used a four-horse chariot team, which continued to be employed by the Etruscans (c. 900 B.C.E.) and the Northern Europeans. After the fall of the Roman Empire, little is known about medieval chariots until the twelfth century. Apart from new technology evidenced by a lathe-turned and mortised hub, chariots of this period do not show much technical innovation. Instead, a series of wheeled vehicles served mainly as carting or farm vehicles and, in battle, moved men and weapons.

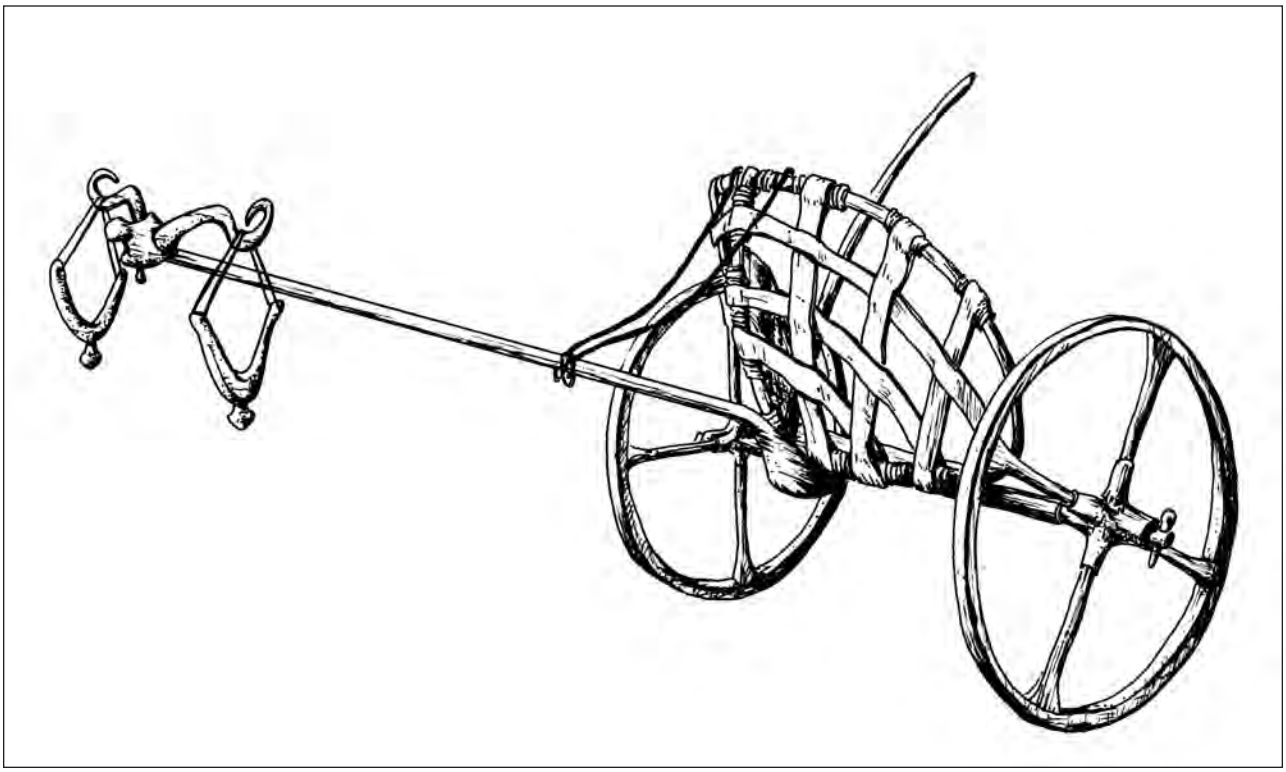
Iron Age wheelmakers often lined wheel hubs with bronze and then fitted them with an iron collar.

Roman designs introduced a gear-like set of rods made of wood to form channels inside the hub or to turn between the hub and axles.

The harness remained unimproved beyond the yoke until the twelfth century introduction of the traction harness. In Han Dynasty China (207 B.C.E.-222 C.E.) and in third century C.E. Persia, girth bands were developed to harness horses without choking them. The leather breast band fell horizontally to respond to the horizontal pull of the horse.

During the second millennium B.C.E., the horse-drawn light chariot provided armies with new mobility and speed. In early battles, chariots were used to create confusion in enemy ranks in preparation for coordinated chariot and cavalry charges. In China (c. 1400 B.C.E.) the chariot was a mobile command post. Chariots and cavalry were used on flanks or sometimes in front with the objective of outflanking the enemy and gaining rear access to the enemy's vulnerable infantry. At the Battle of Thymbra (546 B.C.E.), Persian king Cyrus the Great used the chariot to take advantage of gaps in the Lydian chariot wings.

Once coordinated teams of chariots and cavalry organized, the role of the chariot diminished, especially in difficult terrain. Charioteers formed elite corps in Near Eastern and Egyptian armies for nearly a thousand years. In Greece, however, where the terrain varied, cavalry replaced the chariot. The Hellenic army consisted of a line of infantry, known as hoplites, in a formation of eight-deep units. The hoplites advanced with the object of smashing through the enemy's front line. Flanking the hoplites were armed spearmen with javelins and shields. The success of the Greek system depended on the hoplites' ability to penetrate the enemy's front line so that in retreat the enemy would be vulnerable to Greek missile weapons. Apart from the two classes of Greek



Kimberly L. Dawson Kurnizki

A two-wheeled, four-spoked Bronze Age chariot constructed with bent wood, showing the Y-shaped forms that fitted the pair of horses to the yoke.

infantrymen, hoplites and spearmen, there was no cavalry force, nor was the composite bow used extensively in conjunction with chariot attacks. With these battle tactics, the need for chariots disappeared.

The characteristics of the Greek fighting style were established in the decisive Battle of Cunaxa (401 B.C.E.), in which Persian prince Cyrus the Younger attempted to seize the throne from his brother Artaxerxes II (r. 404-359/358 B.C.E.). The hoplites easily dispersed the Persian infantry and drove Cyrus's forces off the battlefield, killed him, and isolated the Greek infantry in Cyrus's employ. Here the cavalry replaced the chariot because the cavalry could exploit tactical maneuvers on the battlefield and added a flexibility not possible with the chariot. The lesson was not lost on the Macedonian army led by Philip II (382-336 B.C.E.).

Philip's Macedonian army formed a core around the "Companion cavalry." This group numbered about two thousand, and Philip added about six thousand other armed cavalry from previously conquered Near Eastern groups. This cavalry was joined by an infantry of about twenty-five thousand men divided into three main groups: the phalanx, a highly trained group twice as deep as the earlier hoplite formation that provided freedom of movement on the battlefield; the *hypaspistai*, or hypaspists, a secondary shield-bearing corps of soldiers similar to those of the phalanx; and a group of lightly armed soldiers equipped with javelins and bows. Because these forces were effective against chariots and horses, the art of chariots soon disappeared from battle formations and became limited to observation posts or command posts.

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Elizabeth L. Meyers

Firearms and Cannon

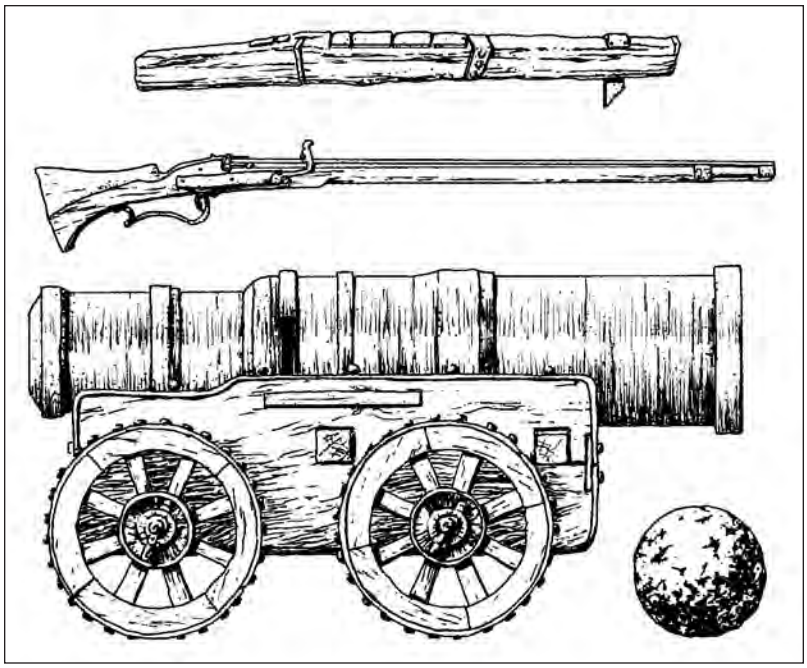
Dates: To c. 1500 C.E.

Nature and Use

The first precise recipe for gunpowder, a Chinese invention dating to before 1000 C.E., is found in a work from 1044. Long before it gained any military significance, gunpowder was used for holiday displays of colored smoke and fireworks. The earliest evidence of gunpowder weapons is a set of figurines dating from 1128 found in a cave. One figure holds a device that appears to be a potbellied vase with a blast of fire coming out, within which is a disk that probably was intended to portray a ball. Further evidence from Chinese records and art indicates that gunpowder weapons were in widespread use by 1280. These weapons seem to have included the three essential elements of true gunpowder weapons: a metal barrel, an explosive powder similar in chemical makeup to that of black powder, and a projectile that filled the barrel in order to take full advantage of the propellant blast.

The consensus among historians is that the Mongols carried gunpowder westward from China in the thirteenth century, but there is no agreement on whether gunpowder weapons were brought to Europe with the powder. The first European mention of gunpowder was by thirteenth century scientist and educator Roger Bacon (1220-1292), who recorded a recipe in 1267. His term, "fire for burning up the enemy," suggests that Bacon regarded gunpowder as an incendiary, not a propellant. Late thirteenth century gunpowder recipes called for saltpeter, sulfur, and charcoal in the proportion of six parts saltpeter for every one part each of sulfur and charcoal—a more explosive combination than that used by the Chinese and therefore better for projectile weapons. There is no convincing evidence for the existence of such weapons before 1326, although several earlier sources have been interpreted as referring to them.

Although a reference to the making of gunpowder artillery found in a 1326 document from Florence is widely accepted as the first reliable mention, it is less informative than an illustrated English manuscript from the following year. This illustration shows a large pot-bellied vessel lying on its side on a table



Kimberly L. Dawson Kurnizki

From top to bottom, a harquebus, the first effective matchlock firearm, dating from around 1470; a more evolved matchlock musket, dating from around 1600; a muzzle-loading bombard, known as "Mons Meg," dating from around 1440.

with a large bolt projecting from its mouth, which is aimed at the gate of a walled place. Behind the device stands an armored man with a heated poker, which he is about to put to its touch hole. Such a device became known as *pot de fer* (iron pot). As that illustration reveals, these early gunpowder weapons were largely associated with sieges. The first definitive mention of them in action came from a siege of Tournai (1340). Whether the English deployed cannon in the Battle of Crécy (1346), the first decisive battle in the Hundred Years' War, is disputed, but they did use them at the Siege of Calais (1346-1347).

In field warfare, early gunpowder weapons—both firearms and artillery—lacked the technical quality to compete effectively with longbows and crossbows. Their weight, unreliability, inaccuracy, and slow rate of fire made them inferior in most respects to traditional combat weapons for more than a century after 1327. In sieges, however, these defects were less problematic. The cannonball's flat trajectory assured that the ball would strike low against the high walls of medieval fortifications and be more likely to open a breach than would mechanical artillery, which had a high trajectory. The first known instance of gunpowder artillery bringing a siege to a successful end occurred in 1377 at Odruik, the Netherlands.

By the late fourteenth century, the size of gunpowder artillery had increased greatly. Huge bombards—so called because their hewn stone cannonballs buzzed like bumblebees when fired—reached twenty tons in weight. Balls weighed as much as one thousand pounds, a weight attributed to the balls fired by the largest bombard used by the Turks against Constantinople in 1453. Although a direct hit from a ball of that weight had a good chance of collapsing a wall, bombards were extremely difficult to move, and the amount of gunpowder they required was expensive and difficult to procure. Smaller pieces of artillery went by names such as *ribauld* and *serpentine*.

In Bohemia military leader Jan Žižka (c. 1360-1424) used small cannon in the Hussite Wars (1419-1434) against the forces of the Bohemian king Sigismund (1368-1437). Forced to fight German knights with poorly trained foot soldiers, Žižka developed the *Wagenburg*, a defensive line of wagons. On some were placed small cannon, and on others, men with firearms. The Germans on horseback presented large targets for the inaccurate gunpowder weapons in use, and the smoke and noise of the weapons frightened their horses. Some of the Hussites' primitive firearms had hooks attached that fit over the upper edge of the wagons' sideboards to absorb the recoil and provide a steady base for firing. It has been suggested that the term "harquebus," the common word for the first effective firearms, came from the German for such hook guns.

Turning Points

1044 B.C.E.	The first precise recipe for gunpowder is given, in a Chinese work.
1340 C.E.	The first definitive use of gunpowder weapons is made at the Siege of Tournai.
1346-1347	Cannons are deployed by the English at the Siege of Calais.
1377	The first siege won by cannon is ended at Odruik, the Netherlands.
c. 1420	Corned powder and matches are developed.
1503	The first effective use of the combination of firearms and pikes, a formation called the "Spanish Square," is made at the Battle of Cerignola.

Development

It is difficult to date the development of effective firearms because most of the people who created and used the new weapons were illiterate and did not leave written records. A chronology of firearm technology depends on a few surviving examples, as well as drawings and sketches that are not detailed enough to show the changes involved. Corned powder, which provided greater explosive power than did earlier serpentine powder, appeared around 1420. Corned powder produced higher muzzle velocities and could fire balls capable of penetrating the plate armor worn by the knights who were the mainstay of most fifteenth cen-

tury armies. Higher muzzle velocity, however, could be achieved only with a barrel longer than that of the hand-cannon. Because of such defects, hand-cannons were not competitive with bows until 1450. By then gunsmiths had found the right compromise between ballistic performance and weight by fitting hand-cannons with barrels of about 40 inches in length. The first known illustration of a long-barreled firearm shows it being used for duck hunting. Hunting requirements often produced technological changes that later appeared in weapons.

Another innovation toward more effective firearms was the match-string; soaked in saltpeter, it burned slowly but with enough heat to touch off gunpowder. The match also was developed sometime around 1420, replacing the clumsy and unreliable burning stick. The match, however, created the same problem for its users as had the burning stick: It had to be held in one hand and touched down into the chamber to fire the powder. That meant that only one hand could be used to hold the piece, butted up against the chest, not the shoulder. Too large a charge of powder could result in a broken breastbone. The solution was the matchlock. The matchlock evolved in Germany to include springs, a trigger, and a clamp for holding a smoldering match so that when the trigger was pulled, the match's burning tip was thrust into the powder and touched it off. After the shoulder stock, borrowed from the crossbow, was added to reduce the impact of the recoil from the greater muzzle velocity, the firearm was made up of the proverbial lock, stock, and barrel.

The users of the matchlock device found that coarse powder often failed to ignite and fine powder often created too forceful a recoil. The innovative solution to this problem was to place a small pan filled with fine powder behind the chamber of the barrel and to put coarse powder in the chamber. The match touched off the fine powder in the pan, blowing flame through a small hole into the chamber, igniting the coarser powder there, and firing off the ball. Often, however, the powder in the pan ignited with fire and sparks without touching off the powder in the chamber.

The harquebus, as the first matchlock firearm became known, was developed by 1460, but its impact on the battlefield was slow to appear. As a smoothbore weapon, it was inherently inaccurate: The spin of a ball tumbling down a smoothbore barrel is determined by the last point on the barrel the ball touches as it leaves the muzzle. The user has no idea what direction the spin will cause the ball to take; balls fired from smoothbore weapons never have the same trajectories. Consequently, the harquebus was reasonably accurate for only a short distance, before the un-

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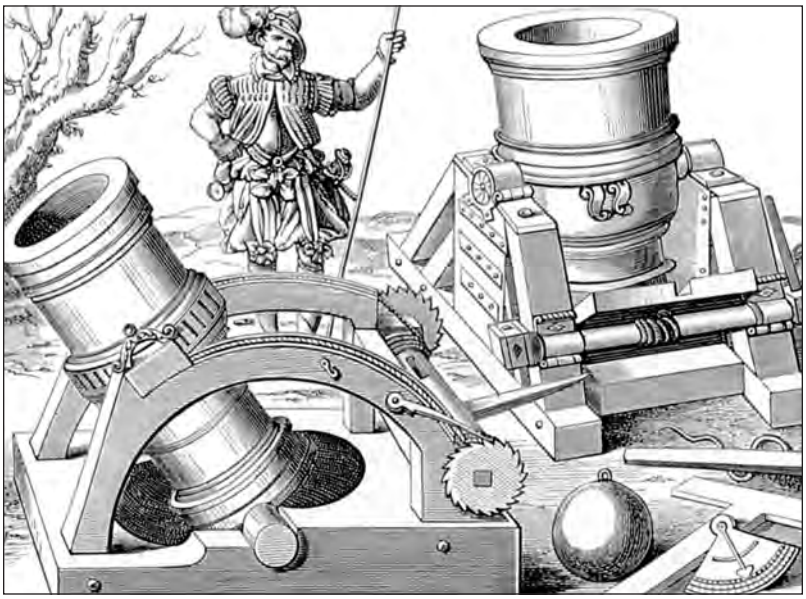
A harquebusier with both sword and harquebus.



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An artist's woodcut rendition of movable sixteenth century mortars.

controlled spin took over. The impact of the ball on its target, even an armored cavalryman, was great at close range, but that advantage was largely negated by the long time it took to reload a harquebus. If the harquebusier missed the charging knights with his first shot or if he had a misfire—a common occurrence with the harquebus—they would be on top of him before he could reload. Before the seventeenth century invention of the paper cartridge that combined a ball and a measured amount of powder, reloading a harquebus, even under the best conditions, took well over a minute. In the confusion and disorder of a battlefield, especially with lance-wielding knights bearing down, many harquebusiers took several minutes to reload or were never able to reload and fire a second time. Compared to longbows, the early harquebus performed poorly in reliability, rate of fire, and accuracy.

The harquebus found its first niche as a siege weapon, where it replaced the crossbow. Firearms were good weapons for urban militias guarding city walls across Europe. A minimal amount of training was required to use the harquebus effectively on walls, and, although the weapon was more expensive than the crossbow, it was still affordable to the artisans and merchants who belonged to the urban militias. The harquebus was probably introduced to the field armies, which doubled as siege forces, in the context of sieges.

The harquebus served for a time as a useful weapon for defending a fortification, but improvements in gunpowder artillery quickly negated the defensive advantage. Because late medieval iron casting produced a poor product, barrels made of cast iron frequently burst, killing gunners and bystanders. Pieces of better quality were made by forging iron bars arranged in a circle and banded by hot metal hoops that tightened down as they cooled. These hooped bombards were the weapons first associated with the name "cannon," which came from a Latin word for "tube." Early cannons, with short barrels and large muzzles, used stone balls. Smaller pieces often were equipped with breech pans, which were loaded in advance and were set in the piece in rapid succession for firing. Another solution to the poor quality of pieces made with cast iron was to use bronze instead. Europeans were familiar with the casting of bronze bells, and that technology was easily transferred to the making of weapons. The use of bronze allowed gunmakers to manufacture long-barreled pieces with smaller muzzles—called culverins, from a French word for serpent—that were capable of using iron or lead balls. The French led in the development of high-quality culverins and of the gun carriage, with high wheels and long tail, that defined gun carriages until the nineteenth century. With an artillery train of some eighty bronze culverins on mobile carriages, French king Charles VIII (r. 1483-1498) had great success in reducing Italian fortifications during the initial phase of the Italian Wars of 1494-1559. In the Battle of Fornovo (1495) the French artillery also played a significant role as an effective field weapon.

During the wars in Italy after 1494, field armies began to include harquebusiers. At the Battle of Cerignola (1503) in the French-Spanish war over Na-

ples, the Spanish commander Gonzalo Fernández de Córdoba (1453-1515) devised a way to make effective use of harquebusiers by digging trenches in front of their lines. This action transformed the battlefield into a fort and imitated a siege, a situation in which the harquebus had long proven itself. Harquebus fire raked the French forces as they approached the Spanish trenches. Over the next twenty years, the Spanish rapidly increased the number of handgunners in their forces and developed the infantry formation called the "Spanish Square," in which pikemen and harquebusiers provided mutual support for each other. It remained the dominant infantry system until the beginning of the Thirty Years' War in 1618.

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Frederic J. Baumgartner

Ancient Fortifications

Dates: To c. 500 C.E.

Nature and Use

Fortifications are structures built by human beings for the purpose of warding off attacks by hostile animals or humans. In the broadest sense, fortifications can be forms of protection, such as armor, inoculation, or even insect repellent, worn by an individual to protect against harm. Fortifications can also be communal defenses, such as forts, moats, walls, or the "strategic missile defense," a proposed network of satellites positioned in outer space to protect against attacking ballistic missiles. In the study of warfare, "fortifications" generally refers to temporary or permanent communal defenses against attacks by human enemies. Temporary fortifications for immediate use in battles or other engagements are called "field fortifications" to distinguish them from permanent structures such as castles, stone walls, and forts.

Development

In Neolithic times, small villages were located either on high ground or in barely accessible areas reached only with considerable difficulty. Where nature did not provide a barrier to intruders, human ingenuity placed trenches, palisades, or moats over which bridges could be placed or removed. These three types of defenses, when intended to protect against other humans, were the first military fortifications.

It seems likely that permanent fortifications evolved in response to the settling of agricultural communities. Early fortifications did not require much sophistication, because threats came mainly from weak and desperate nomadic individuals or from small raiding parties. Jericho—an agricultural community in the Jordan Valley north of the Dead Sea, settled in part because of its celebrated spring, which provides a thousand gallons of water every minute—is believed to have been the first town to build an encircling fortification, around the fifth millennium B.C.E. The town was surrounded by a stone circle and a massive tower, also of stone, that enabled lookouts to spot potential enemies long before they arrived. It is not currently known whether there were such fortifications in the Old Kingdom of Egypt, though fortifications on a large scale would certainly have required an advanced degree of political organization.

In an era when the principal weapons were spears, swords, and arrows, permanent fortifications were an effective defense against swift and vigorous frontal attack. The safest and most effective means of conquest was by siege: an attack on or blockade of a city or castle, in which the inhabitants would be starved, frightened, or bored into submission. The Trojan War (c. 1200-1100 B.C.E.) was basically a ten-year siege of Troy by the Greeks. Legend indicates that even after such a long period of time, Troy would not have fallen but for the Greek stratagem of the Trojan horse. The Trojan horse was a large, hollow, wooden horse placed outside the Trojan gates. The Trojans were deceived into tearing down their own gates so that the horse, and the Greeks hidden within it, could enter.

The difficulty of a successful siege lay in maintaining an army in the field for a sustained length of time. Without regular supplies, the army laying siege would be compelled to withdraw, especially if the besieged party had, as in the case of Jericho, access to water and food. Even if the fortification could hold out, a siege might end if there were a betrayal, stirred by civil strife or bribery.

Assyrian reliefs show that by 850 B.C.E., the principles of fortress building were already in place. Portrayals of military camps of the period show them as round and reveal curtain walls, or protective walls

between gates or bastions; loopholes, small holes for shooting arrows; parapets, guarding walls at the edge or terraces of a building; crenelation, or repeated depressed openings; strong, fortified gates; and towers or bastions, projections from the curtain walls. With all these defenses, no part of the wall went unobserved or undefended. As more and more of the world became civilized, city walls became regular parts of landscapes. Rare was the city, such as Sparta or Rome for a good part of its history, that could boast of its security with an absence of walls. It was a glaring indication of Rome's decline when, in the third century C.E., Aurelian built new walls for the imperial capital. When siege equipment, such as battering rams and catapults, came into use in the West, walls were thickened and made higher, and deeper moats were dug to provide further protection. Eventually, as better organization and more money became available, empires were able to construct monumental fortifications such as the Great Wall of China, built in the third century B.C.E. during the Qin (Ch'in) Dynasty (221-206 B.C.E.) and Hadrian's Wall in northern England, built on the orders of the Roman emperor Hadrian around 122-136 C.E. These fortifications were the greatest military structures of the ancient world.

AFRICA

Egypt is a land blessed with natural defenses. To the west of the Nile Valley lies the immense Libyan Desert, to the east, the Arabian Desert. To the south are the high rocky ledges of the Nile River cataracts and, to the north, the Mediterranean Sea. Beyond the cataracts to the south was Nubia, a land inhospitable to agriculture but valuable for its copper, gold, semiprecious stones, and exotic animals. Here, during the Middle Kingdom (c. 2000 B.C.E.), Egypt set up a system of forts to protect its conquests of Nubia. These fortifications stretched for 250 miles between the first and fourth cataracts and gave protection to the settled areas of both river and desert. They were constructed close enough to one another that communication by fire or smoke signals was possible. The first forts, in Lower Nubia, close to the first cataract, seem to have been planned to support the agricultural communities living along the banks of the Nile; the later forts, in less civilized areas to the south, probably were established to serve as a military line marking the southern frontier of Egypt. Garrisons were maintained to administer, rule, and protect the populations, and perhaps also to intimidate them into continued submission to the central authority.

ASIA

Sumeria, the world's oldest known civilization, was located in southern Mesopotamia, the fertile land between the Tigris and Euphrates Rivers. The Sumerians created walled communities at the foothills of the Mesopotamian alluvial plain. By about 3000 B.C.E., the Sumerians were building independent cities, among which Ur, Uruk, and Kish were the most prominent. These cities did not at first have walls, perhaps suggesting an absence of warfare. However, peace did not last, and between 3100 and 2300 B.C.E.,

TURNING POINTS

c. 5000 B.C.E.	The city of Jericho becomes arguably the first town to be fortified with a stone wall.
1204-1194 B.C.E.	The fortified city of Troy is besieged by the Greeks for ten years and falls only after succumbing to the Greek deception tactic of the Trojan Horse placed outside the city's gates.
850 B.C.E.	The principles of fortress-building are evidenced in an Assyrian relief sculpture.
4th-3d cent. B.C.E.	Mediterranean city-states undertake massive building of walls during a period of warfare.
214 B.C.E.	Chinese emperor Qin Shuangdi orders that the many portions of the Great Wall be joined to form a unified boundary.
c. 122-136 C.E.	Hadrian's Wall is constructed in northern England, marking the northernmost border of Roman Empire.
370	Rome rebuilds its walls as protection against barbarian invasions.

Mark Harris/Getty Images

The Great Wall of China, which traverses a distance of 4,160 kilometers and is the largest defensive barrier in the history of humankind, was built to defend China against Mongol invaders.

war seems to have been a regular part of life and death. By 2700 B.C.E., the city of Uruk had erected walls of about 5 miles in length. The Akkadian king Sargon (c. 2334-2279 B.C.E.), one of the first great Mesopotamian leaders, conquered Sumeria and upper Mesopotamia and may have organized the various fortified communities he encountered into an interconnected whole. Rock sculptures depicting Sargon's grandson Naram-Sin (c. 2261-2224 B.C.E.) seem to show well-defined fortifications, as well as some of the methods of siegecraft, particularly the breaching and scaling of city walls.

The ancient Mesopotamian city of Babylon, capital of the Babylonian Empire first established in the early eighteenth century B.C.E., serves as an excellent example of a city well fortified for defense. The ancient account by the historian Herodotus (c. 484-424 B.C.E.) tells of a wall 15 miles long, 85 feet thick, and 335 feet high, surrounded by a broad, deep moat. Queen Nitocris, he adds, altered the straight-flowing Euphrates so that boats sailing to Babylon would pass the city three times before flowing through a tunnel under the wall and into the city itself. The same queen diverted the river and excavated a huge lake in order to slow the river's course, again giving Babylonians time to prepare a defense. The Persian king Cyrus the Great (c. 601-590 to c. 530 B.C.E.) conquered the city by diverting the river from its course and then marching his soldiers over the drained riverbed and through the wall. A generation later, around 520 B.C.E., when Babylon rebelled against the Persian king Darius I the Great (550-486 B.C.E.) and appeared likely to withstand a protracted siege, the city was taken by trickery, when one of Darius's men,

pretending to be a defector to Babylon, opened the gates to the Persians.

The walls of Babylon required immense size to resist siege engines, battering rams, scaling ladders, siege towers, and catapults. Powerful battering rams are depicted in a Mesopotamian palace relief sculpture dated to 883-859 B.C.E. A mobile siege tower has been dated to 745-727. The biblical book of Chronicles speaks of King Uziah's stone-throwing machines, which protected Jerusalem, although most historians believe this reference to be an anachronism inserted by a later writer. These sorts of weapons did not come into widespread use in Europe until the fourth century B.C.E.

Fortified cities appeared later in China than in Egypt, sometime during the Shang Dynasty (c. 1523-1027 B.C.E.). Because the land did not provide trees, earthen walls were used there instead. The Great Wall, perhaps the world's most famous fortification, was made by connecting many small, local walls that had been constructed previously by regional rulers. The line of the wall kept changing until, by the third century B.C.E., it lay on the border between the agricultural areas, where irrigation was possible, and the unsettled pastoral lands, where nomadic life predominated. The line of the wall varied as it moved north to enclose the Ordos plateau or extended toward the west to the Tibetan plateau. The wall was relocated as changes in climate, landscape, and population caused shifts in the frontier between civilized and uncivilized regions. In the end, the length of the wall, with all its extensions and branches, was nearly 4,000 miles.

The wall's purpose is ambiguous: It may have been principally to keep the population in or to keep marauders out. Only a wealthy and powerful bureaucracy could have afforded to build and maintain such a structure. Only a well-organized army would have dared to oppose it. That China did not rely on the wall for its sole defense is clear from the fact that the Chinese never tore down the walls around the cities where irrigated farming communities had developed. Yet the wall must have intimidated any nomads contemplating attacks upon the awesome might of the wall's builder.

EUROPE

The earliest defensive structures in Europe seem to have been built in about 2200 B.C.E. in Britain, perhaps as early agricultural communities began to wage war with one another for resources or political power. In Dorset, a gate with massive timber posts 5 feet across has been dated from this time.

The Greek city-states that developed during the barbarous period known as the Greek Dark Age (about 1100-900 B.C.E.) at first fortified only an acropolis, a citadel located on a hill used as a refuge in times of war. Poverty was surely the reason for the limited defense; walls were expensive, and a sparsely populated agricultural society would not have been able to afford them. In the flush of success after the Greco-Persian Wars, however, the Athenian general and statesman Themistocles (c. 524-c. 460 B.C.E.) persuaded his fellow Athenians to rebuild the city's walls and its harbor, known as the Piraeus. About three decades later, his successor, Pericles (c. 495-

AP/Wide World Photos

The remains of a Roman fort along Hadrian's Wall, showing a vaulted underground room, in Northumbria, England.

HADRIAN'S WALL IN ROMAN BRITAIN, C. 122-136 C.E.

429 B.C.E.), persuaded them to build the Long Walls between Athens and the harbor, so that even during a long siege the city would have access to supplies from the sea. Battles in Greece traditionally had been fought outside the cities. However, during the Peloponnesian Wars (431-404 B.C.E.) and increasingly throughout the fourth century B.C.E., cities themselves were targeted directly. Throughout the Hellenic world, cities used their wealth to expand their fortifications, so that by the third century B.C.E., places such as Rhodes and Pergamum had fortresses as strong as any found in later times. These fortresses possessed multiple walls that provided mutual cover, so that if the exterior walls were scaled by invading enemies, the enemies would find themselves trapped between the scaled exterior wall and additional interior walls.

The account by ancient Greek historian Thucydides (c. 459-402 B.C.E.) of the Spartan siege of Plataea (429-427 B.C.E.) is perhaps the most revealing ancient account of siege warfare before the adoption in Greece of sophisticated siege engines. It also illustrates the use of field fortifications. While the Plataeans themselves were enclosed behind their walls, the Spartans worked continuously for seventy days to put up a palisade, or fence of stakes, made from fruit trees. They added timber and laid it in a lattice to support a mound of wood, earth, and stones. For their part, the Plataeans built up their wall opposite the mound to a great height, protecting it with hides against hostile burning arrows. In addition, they pulled down part of the wall where the Spartan mound abutted so that they could carry its dirt into their city, thus forestalling the mound's growth. The Spartans took the countermeasure of twisting clay in wattles of reeds to prevent the soil from being carried away, and the Plataeans responded by digging a tunnel under their wall to the mound and using it to carry away more mound material. The Plataeans also built a crescent wall inside their outer wall, so that if the first wall were taken, the enemy would have to begin anew with a fresh mound. When some simple siege engines and an attempt to burn the city also failed, the Spartans built a wall, or circumvallation, around Plataea and left a small force to continue the siege. After two years, the Plataeans ran out of provisions and surrendered to the Spartans, who killed them all.

Macedonian conqueror Alexander the Great (356-323 B.C.E.) conducted at least twenty sieges during his conquests, succeeding under the most difficult of circumstances. His 332 B.C.E. victory at Tyre, an island fortress that he attacked by means of a mole constructed from the shore to the island, and that against Prince Ariamazes of Sogdiana, whose mountain fortress Alexander captured in 328 B.C.E. by means of mountaineers from above, are perhaps his most splen-

did triumphs over seemingly insurmountable fortifications.

In Roman mythology, Romulus and Remus, the twin sons of Mars, the Roman god of war, founded the city of Rome. After a quarrel, Romulus supposedly killed Remus and built walls around the city. However, whatever walls Rome may have had in its early period were insufficient to keep out the Celts, who sacked the city in 390 B.C.E. Although this attack may have had a psychological impact on the city of Rome, it seems to have had no major political results. A few years later, the Romans built a massive wall, parts of which still stand. As Rome grew, however, it gave up its walls, so proud of its might and its policy of offensive preemptive strikes against enemies that it felt no need to fortify the city. During the Empire, Rome rarely faced enemies capable of organizing the siegecraft and supplies that would allow them to undertake long sieges against the well-stocked Roman garrisons. The would-be challengers functioned at little more than a tribal level and could not afford fortifications that would have been able to withstand the imperial army.

Toward the end of the third century C.E., Emperor Aurelian (c. 215-275) fortified Rome with a wall 12 miles around and 40 feet high, a structure that no doubt protected the citizens against the increasingly frequent barbarian forays into Roman territory, but the perceived need of which foreshadowed the precarious state of the Roman Empire. Cities in Gaul and Spain were also fortified with walls from this time, though at a fairly slow pace. Rome accelerated its building of chains of forts along the North Sea and Atlantic coasts, but when these frontier defenses were overcome by the Huns, the empire lay vulnerable.

To maintain their empire, the Romans built a system of forts, first in open territory, for the purpose of controlling the surrounding countryside, and later on hilltops where there were extensive views for keeping watch. It is likely that a coherent imperial policy dictated a standard form of forts and their distances from one another. In general, Rome used a cordon system of forts and watchtowers without running barriers.

It is believed that a Roman army on the march erected a temporary camp every night. As part of their individual equipment, soldiers carried stakes with which to construct a palisade on top of a bank of earth, which was made by digging a ditch around the camp and piling the earth on the inside perimeter. Although Flavius Vegetius Renatus, a late fourth century C.E. Roman military theorist, lamented in his time the fact that soldiers no longer carried the tools or were trained to construct such camps, by Vegetius's time, Rome's military was used primarily for defense and its system of permanent forts was already in place.

THE AMERICAS

The principal weapons used in the Mayan lowlands, which were populated as early as 1000 B.C.E., seem to have been spears, though clubs and knives were also used. Because these weapons did not pose the same dangers as did arrows or other projectiles, Mesoamerican fortifications did not need overlapping fields of vision. Thus, walls projecting outward from the main fortress—an identifying characteristic of forts in Europe and Asia—were unnecessary. As a result, it is at times difficult to identify certain archaeological sites as fortifications. What appear from the bottom of a mountain looking upward to be walled fortifications may appear from above to be terraced retaining walls. One might wonder whether the appearance as a fortification was designed to discourage would-be attackers or merely was a result of construction methods and topology. Although these questions cannot be answered, freestanding walls with moats in front of them do suggest strongly that these structures were fortifications. The fighting among early American peoples was intense and continuous, and its aim seems to have been, not the death, but the capture of the enemy for sacrificial purposes.

Before 600 B.C.E., there do not seem to have been major permanent fortifications, but, from 600 to 300 B.C.E., as dispersed settlements were replaced by larger societies, more hilltop sites were constructed. Lowland fortifications, generally embankments surrounded by ditches, seem not to have been very intimidating structures, but perhaps were adequate to the military requirements of those early periods. In-

habitants of Mexico's Valley of Oaxaca developed probably the most complex Mesoamerican culture in the centuries before the Christian era. Its religious center, Monte Albán, rose on a series of hills. Monte Albán was fortified around 200 B.C.E. with an earthen wall of 1.8 miles, a height of between 10 and 13 feet, and a width at its greatest of 60 feet. A large reservoir was also built that could hold enough water to sustain a siege of several years. In short, it was a structure that was as well suited for its purposes as some of the contemporaneous fortresses elsewhere in the world.

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James A. Arieti

Medieval Fortifications

Dates: c. 500-1500 C.E.

Nature and Use

In even the earliest and most primitive societies, the need to stave off attackers led to the construction of defensive physical structures. The variety of such responses naturally became ever more diverse as groups worldwide had to meet the intersecting challenges of the foe, their own resources, climatic and geographical constraints, and anticipated forms of organized violence. Fortification is thus any construction, permanent or transitory, earthen, organic, or stone, designed to shield defenders from an attacker while those defenders either await help or resist assaults themselves. Even with the rather limitless bounds of human ingenuity, fortifications nonetheless tend to fall within four somewhat interrelated categories: refuges, strongholds, fortified lines or zones, and urban walls.

Development

By 500 C.E., each type of fortification had appeared numerous times in human conflicts. A stronghold differs from a refuge in that it is a place that hosts an active defense; from its walls, defenders may launch offensive sallies. The refuge, by contrast, is primarily defensive, a place to wait out the enemy in such a position of strength that the enemy will forgo the costs of attack. The final types of military architecture are even less distinct; city walls are in one sense fortified lines. Here, though, the concern is with those fortified zones meant to secure the peace of whole regions.

All types appeared concurrently and in overlapping cycles of need and development worldwide before Europe's medieval period. The Roman Empire had its own strategic mix of city walls, fortified frontiers, and the near-instant fortress otherwise known as an encamped army. After the Empire's fall in Western Europe, its legacy continued in the walls that surrounded many cities, the fortified zones of northern England and the Rhine and Danube Rivers, and the defenses of Constantinople, which stymied and stupefied many an invader. In Asia the tradition of long walls was already centuries old, having been initiated by the first Qin emperor in 221 B.C.E. In the Americas, the lack of metallic technology severely constrained the forms warfare might take; moreover, the earliest Mayan societies may well have not had, in the traditional Western sense, cities to defend. In sub-Saharan Africa and Australasia, the archaeologi-

Time Line

c. 757-796	Offa's Dyke is built in the kingdom of Mercia to protect the kingdom's Welsh border.
880's	King Alfred the Great begins constructing a series of *burhs*, or garrisons, to defend Wessex from Vikings.
990's	The first stone keeps appear in northwestern Europe.
1066	Rapid proliferation of motte-and-bailey castles follows the Norman Conquest of England.
1196-1198	King Richard I of England builds Château Gaillard with three baileys, which had to be captured before the castle could be taken, serving as multiple lines of defense.
1277-1297	King Edward I of England builds a series of ten Welsh castles, with an implicitly offensive function as continuances of the king's campaigns.
1494	Charles VIII's invasion of Italy confirms the obsolescence of high medieval defenses.

cal record has been less forthcoming. Doubtless, the inhabitants shaped earth as needed into ditches and ramparts, the latter surmounted even today by thorny hedges, known as *bomas* or *zarebas*, to keep out predators.

FORTIFIED LINES

Despite the remaining fortifications that surrounded them, the Europeans of the Germanic West had difficulty reaching the level of defensive sophistication of the Roman Empire. Even with the extant physical reminders of the Roman fortified lines, especially Hadrian's Wall in Britain, they declined to maintain such lines and delayed a long time building their own. Perhaps they saw little point to such defenses, which had failed to keep them out of the Roman heartlands. The permeability of such zones has raised a number of debates as to their real purpose, and whether they were meant to prevent invasion, to slow invaders, or to keep internal populations within limits. The Saxons, who invaded Britain after the 450's, found the defenses of the Saxon Shore did little to slow their conquest. To the north Hadrian's Wall likewise hindered the Picts little in their raids.

Hadrian's Wall stretched for 117 kilometers across northern England, ranging in thickness from 2.3 to 3 meters and averaging a height of from 5 to 6 meters. The wall was part of the Roman strategy of defense in depth. In the absence of manned watchtowers and fortified camps to the rear, the Saxons were hardly set to use the wall to its best advantage. Even so, the wall did form, in its less than pristine state, something of a hindrance to the return of raiders northward. Northumbrian pursuers could count on it slowing marauders if those raiders tried to get their spoils through or over the fortifications.

It would appear that Offa's Dyke, built during the reign (757-796) of that Mercian king, was meant to achieve an effect along the Welsh border similar to that of Hadrian's Wall. An earthen rampart 18 meters wide formed in part by the ditches that bracket it, Offa's Dyke meandered for 192 kilometers through regions that had little in the way of leftover Roman defenses or roads. There was little hope of keeping out Welsh raiders, especially since the dyke was virtually unmanned. Again, though, its physical bulk would slow the exodus of such raiders, especially if they were driving stolen livestock, permitting Mercian forces to catch up with the marauders. In addition, the dyke provided a roadway that cut across the ranges and rivers of the Welsh marches, thus easing both the report of such raids and the speed of reaction.

The impassability of terrain might make fortified lines not only a cost-prohibitive measure but also a rather unnecessary one. In Mesoamerica contending empires could keep invaders at bay simply by blocking well-established paths. In the absence of siege equipment and draft animals, such structures would not have needed much complexity to be effective. In Europe fortified bridges developed not only to secure lines of communication and transport but also to block the progress of Viking raiders up the river systems. Thus a number of such bridges controlled the rivers below Paris after the 880's to prevent direct access or indirect efforts by portage. When Vikings actually did besiege Paris in 885, it took them over four months just to reach the city.

The most famous and latest of all fortified lines are of course those of China. The Great Wall is not actually a single wall curling along China's northern borders, nor does its current condition date back to 221 B.C.E. The earliest (Qin) walls were earthen, tamped down by forced labor between retaining wooden walls that connected watchtowers. The actual remains of this wall are now in the realm of conjecture. The current masonry walls—which are actually many sets of walls, not always connected, and not one continuous line—date from the Ming Dynasty (1368-1644) emperors, who reigned after the expulsion of the Mongol Dynasty. The facts of these fortifications are impressive: 2,400 kilometers in length, 7.6 meters high at a minimum, often 9 meters wide, and sometimes scaling 70-degree slopes. Like their European counterparts, however, they proved less than impermeable, again raising the question of whether the walls were more clearly intended to keep the native population contained within and untainted by exterior contact.

As the Germanic groups, especially the Franks, entered the deteriorating Roman Empire, they brought

a new structure to the landscape: the private fortress. Although these small refuges, which utilized so little stone, have left few archaeological remains, contemporaries noted their appearance in rural and isolated areas. Most important, commentators of the day stressed the remoteness or inaccessibility of such sites. Because of the new inhabitants' rudimentary technology, these protocastles relied on their physical surroundings to deter would-be invaders. On isolated summits, crowning precipitous sites, these forts gave some protection to the rural regions of Gaul and Visigothic Spain; their small size and private ownership, however, limited their value as refuges for a harried populace. Instead, the later Frankish kings found them to be troublesome centers of resistance, because it was so difficult to bring an army to bear on such places.

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The twelfth century attack and defense of a city wall, with numerous types of siege engines in use.

The situation differed in eighth and ninth century Anglo-Saxon England, especially Wessex. By the 870's, after Viking invaders had occupied much of England and pushed into Wessex, King Alfred the Great (r. 871-899) secured a truce after his victory at Edington (878). During the cessation of active campaigning, Alfred devised a sophisticated defensive strategy centered upon thirty-three refuges. These *burhs*, as they were called, were scattered over the kingdom, seldom more than a day's ride apart, and usually near major transportation routes. Often quite sizable and well provisioned, the burhs were meant both to house a large garrison and to provide ample room into which a refugee population might flee. Alfred's strategy, which would prove successful in 896, was to have the population and movable wealth protected in the burhs while he shadowed the invading Vikings with the Wessex army. By hampering the Vikings' ability

to forage or pillage, Alfred simply made his kingdom an uninviting prospect to Viking plunderers.

These fortifications did not have to be terribly complex, because the Vikings had little in the way of siege weaponry. Nonetheless, Alfred's administration prepared the burhs well, as is known from a document called the *Burghal Hidage* (c. 920), which lists them. By dividing the resources of the kingdom into units called hides, each of which was sufficient to provide one man for burh garrisons, the Anglo-Saxons assigned enough hides to each burh to assure that its walls were defended by one man for every 1.3 meters. Because some burhs had circumferences of over one mile, this meant that Viking invaders had to sense the sizable numbers of uncowed foes they left in their wake as they bypassed the burhs. The burhs themselves were formidable: The first barrier was an exterior ditch perhaps more than 30 meters wide and sometimes as deep as 8 meters; an earthen bank came next, reaching up to 3 meters in height; timber defenses surmounted this ringwork in most cases, but stone walls were put in place at major sites, especially those that housed the royal mints. Many burhs took advantage of natural defenses, such as swamps and rivers, whereas others were built upon the remains of previous Roman fortifications.

The advantages offered by burhs or even the most simple defenses naturally drew people to those fortified locales. This rationale appears to explain the growth of the stone enclosures at Great Zimbabwe centuries later. The original impetus for the southern African plateau's settlement remains debated, but the availability of iron doubtless held part of the appeal. At all three parts of the site, the most restricted sites are those where archaeology has found iron stores or iron-working tools. Between 1100 and 1500, the Great Enclosure was built, with walls of quarried granite about 10 meters and without any mortar, encompassing first a hilltop and later a site across a small valley. Early in the twentieth century, the archaeological record at Great Zimbabwe was greatly altered or nearly destroyed, and the reason for the site's abandonment by 1700 is unknown. However, no one has supposed a victory by besiegers.

STRONGHOLDS

The transition in Europe from simple refuges to castles came with the motte-and-bailey structure, whose origins lie in the tenth and eleventh centuries. The heart of this fortification was the motte, a steeply conical mound surrounded by a ditch and crowned by a timber palisade. Within this enclosure, a wooden tower originally rose, most often on stilts. The bailey was a secondary enclosure at the base of the motte, somewhat kidney-shaped as it fit alongside the motte. Separated from the motte by ditches and protected by its own palisade and ditches, the bailey formed a living area and an extra line of defense. From the bailey, a bridge either spanned the ditch on a more convenient gradient to the motte's gate or reached only to steps cut into the motte's steep slope. If the bailey became lost to attackers, the bridge was easily disposable. The quick proliferation of the motte-and-bailey lay in its most basic advantage: It provided a maximum amount of defense at the lowest cost of construction. Moreover, it was possible to build one within days.

In addition to its defensive capabilities, the motte-and-bailey had an offensive potential. As an easily built, forward base for troops, mottes were useful in subduing hostile regions. One of the earliest builders of mottes, Fulk III (c. 970-1040), the count of Anjou, used castles to push his borders farther toward Normandy. In turn, the Normans learned from this tactic and applied it most dramatically in the conquest of England. William the Conqueror (c. 1027-1087) built motte-style fortifications immediately upon his arrival in England, a fact graphically illustrated in the Bayeux tapestry. After his victory at the Battle of Hastings (1066), William and his chief followers brought the whole of England under control by establishing motte castles at crucial points throughout the kingdom. After the transition to stone castles became widespread in the twelfth century, many mottes did not have the stability to support massive keeps as replacements for the wooden towers. Instead, the palisade was rebuilt as a "shell keep," so that the weight of the new masonry was dispersed over the mound.

Although the use of timber castles continued into the thirteenth century, the transition to stone appears

to have begun in the late tenth or early eleventh century, owing in part to the innovations of Fulk III. Some scholars have convincingly argued that the bulky, rectangular towers at Langeais and Montbazon, reaching to 16 and 30 meters high respectively, were Fulk's constructions and that Fulk may well have been responsible for a number of other stone castles in the region. Not surprisingly, many of the stone castles surrounding Anjou date from soon after this period, as Fulk's rivals and successors imitated his new building program. These new keeps, or donjons, were massive, multistoried edifices that could house many troops. Fulk's two towers had walls between 1.5 and 3 meters thick and up to 30 meters high. The White Tower in London, begun by William the Conqueror, had walls as thick as 4.5 meters and as tall as 27 meters, with the corner turrets reaching above that height. It comprised 30 square meters, and the keep at Colchester was even larger.

The new preference for such expensive and mammoth constructions physically reflected the increasing wealth of the feudal nobility as principalities such as Anjou, Normandy, and of course, England, stabilized. The ability of these lords to command greater resources also meant they could put better-equipped armies into the field. Thus the siege weapons of antiquity, which had never completely been forgotten, began reappearing: battering rams, ballistae, onagers, and later, the trebuchet, as well as the old standby, fire. Successful defense against these weapons required the use of stone. The spread of castles was dramatic: The French province of Poitou had only three castles before the Viking incursions, but at least thirty-nine castles dotted the province by 1100. No archaeological evidence has been found of castles in the northwestern region of Maine before 900; two centuries later there were sixty-two. Other regions saw similar levels of castle-building. Such numbers do not take into account fortified residences, which lacked the defensive power of castles.

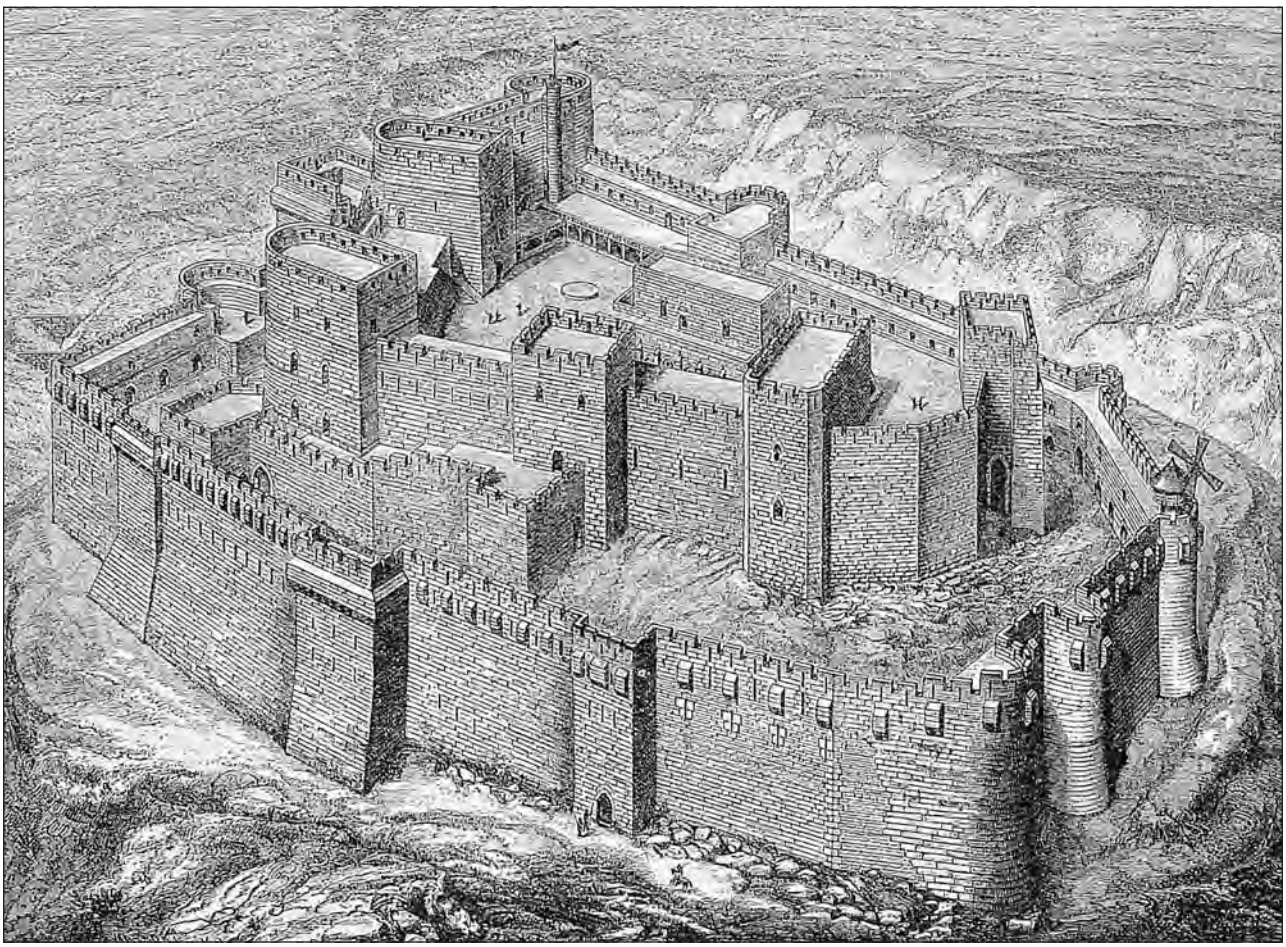
The intensified wealth and warfare of Europe did not account alone for the spread of more sophisticated defenses; inspiration came also from Constantinople and the Muslim fortresses taken only with the greatest effort during the First Crusade (1095-1099). The earliest castles that the Crusaders built were the rectangular keeps to which they had been accustomed in Europe, but the needs of these exposed states and sites soon mandated a change. Larger complexes became the rule in order to house both greater garrisons and the supplies necessary so that such a force could hold out, possibly for years, until relief could arrive from other allies or from Europe. Saphet had a garrison of between 1,650 and 2,000 men, while Margat's 1,000 defenders were supposed to be able to hold out for five years; the cisterns at Sahyun held ten million liters of water. These fortresses reflected Byzantine reliance on high, massive walls studded with towers to provide enfilading fire. These walls could actually be built more quickly than one of the rectangular keeps; moreover, they provided space for vitally necessary cisterns and reservoirs. Some castles still had keeps, but these were a final defensive point rather than the primary one.

The most famous of the Crusader castles is Krak des Chevaliers, which remains impressive even in its ruined state. Occupying a hilltop in Syria that had formerly been a Muslim stronghold, it began with the advantage of difficult access. Its outer wall was added in the 1200's even as the inner defenses were strengthened. This wall encompassed an area of 210 by 140 meters and had both semicircular towers and machicolations, or openings in the overhanging battlements that protected defenders who fired missiles, rolled stones, or dropped combustibles upon attackers at the wall's base. In forested Europe machicolations were only slowly adopted, because wooden overhangs, or hoardings, were so easily built for the same purpose. The higher inner circuit of walls could complement the outer defense with missile fire. Two towers flanked the small gate, which gave access either to the forecourt or to a series of gateways that protected the entrance into the fortress proper. The inner wall, or *enceinte*, was anchored by five large towers. In addition to these defenses, a massive talus, or sloped base, made the walls on the southern and eastern sides virtually impervious to mining and scaling ladders. Apart from its defensive function, the castle's increased lower bulk also protected Krak des Chevalier from the earthquakes that had damaged it in the mid-twelfth century. In later centuries, Japa-

nese castles would also contend with natural catastrophe. Below the talus was an artificial reservoir, and granaries and armories lined the walls. Little wonder, then, that the Mamlūk armies that took Krak in 1271 opted to trick the defenders into surrendering rather than risk an unsuccessful siege.

The lessons learned in the Middle East soon wrought changes in the structure of castles in Europe. Circular towers came to predominate, as castle builders realized that square angles gave attackers extra blind spots to exploit; more important, curved surfaces resisted the projectiles of pregunpowder artillery better than flat ones. King Richard I (1157-1199) of England, also known as Richard the Lion-Heart, would apply this principle liberally at his "saucy castle," the Château Gaillard, where the exterior wall of the inner bailey had a rippled surface. Although keeps continued to be built, including the huge circular donjon at Coucy, which was 31 meters in diameter, the emphasis moved to multiple lines of defense. Gaillard had three baileys to be captured before attackers faced the keep. Barbicans appeared as new fortifications in front of gateways that provided further fire support for this weakest point in a wall. Concentric walls, with the second overtopping the first considerably, became the new fashion in fortification; towers often broke the continuity of such wall-walks so that one portion of the walls could be lost without losing the entire circuit.

The most distinctive examples of concentric cas-



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Krak des Chevaliers, in modern Syria, the most famous of the Crusader castles.

tles were Edward I's (1239-1307) Welsh castles, ten fortresses built between 1277 and 1297. Like their motte-and-bailey predecessors and the Crusader outposts, they had an implicitly offensive function, as their dominating presence and garrisons were meant as continuances of the English king's campaigns. Edward turned primarily to Master James of St. George, a Savoyard architect, to oversee the project. The show of strength may have been as much in the swift construction of the expensive castles as in the high curtain walls pierced with arrow slits, protective drum towers at each angle, and heavily defended gateways. Only one of these castles had a keep, so the emphasis was on the concentric walls. The inner walls loomed high over the outer walls, so that defenders could fire missiles from both. At Harlech and Beaumaris, the successive gates were sandwiched between flanking towers, whereas the entry itself went through a passage. Attackers within the passage would find themselves at the mercy of archers firing through *meurtrières*, or murder-holes.

Although castles would appear during Japan's Sengoku, or Warring States, period (1477-1601), they differed markedly from European models in both geographical and cultural considerations. A typical *hirojiro*, or lowland fortress, had a broad stone base with a curving face which, it was hoped, would offset the threats of earthquake or rain-sodden soil giving way. The towering superstructures above this foundation were actually lightweight wood and plaster, again so built as to survive repeated tremors. Despite the immensity and complexity of Japanese castles, they were rarely the focus of battle, because samurai preferred to display their prowess in the field against individual foes. Such battles also had the advantage of leaving intact buildings to the victor. The Japanese reluctance to adopt Western styles of warfare also meant that artillery had a minimal impact on Japanese castles until the 1800's.

In very different circumstances, the Maoris of New Zealand likewise showed a predilection for ritual combat and the preservation of defenses. The Maori *pa*, the first evidences of which date to 900, seem similar to the motte-and-bailey. At their height, such strongholds often occupied hilltops with difficult access; a wooden palisade surrounded the summit, with ditches in front and embankments within that allowed defenders to hurl weapons upon attackers. The wall was regularly pierced with openings, so defenders could jab spears at those trying to scale the palisade. Close by was a less fortified village whose residents would retreat into the pa when warned by alarms. Long sieges, however, were rare. Attackers would challenge defenders to come out before the pa and engage in single or group combat. If the defenders declined, then a frontal assault might ensue, with the intent of capturing without destroying the fortification and its supplies.

WALLED CITIES

The defensive importance of cities marked both the beginning and the end of the medieval period. The Romans left a legacy of urban fortification: In Gaul alone, nearly 90 of the 115 cities received new walls, smaller in circumference but imposing still with their 10-meter height, 4-meter width, and foundations reaching from 4 to 5 meters underground. These defenses usually withstood Germanic assaults with ease but were rendered irrelevant if the walls were breached by trickery or treachery. Although rare, a long siege likewise could succeed by starving towns into submission. These conditions held true throughout the Merovingian period also, and one is reminded that the Crusaders only gained Antioch through bribery. During the Carolingian period, defenses were often neglected or even quarried for other projects, but repairs began anew with the Viking invasions. As towns grew in wealth and population from the 1100's onward, they had to erect new defenses to safeguard both. This would occur all over Europe, but the most striking example may well be the double curtain at Carcassonne, in southern France, which incorporated lessons learned from the cities of the eastern Mediterranean.

The techniques adopted by European cities may be highlighted by comparison with contemporary settlements in Mesoamerica. Maya centers show remarkable stonework, but it appears that these sites functioned more as royal residences and religious sites than as economic centers. Thus, the majority re-

mained unfortified. Other sites, such as Becan or Mayapán, did have enclosing ditches, large embankments, and wooden palisades, and a few had stone walls topped again by palisades. Sometimes these defensive lines surrounded only core areas of the city. In all cases, however, this military architecture remained rather simple, because besiegers could bring so little weaponry to bear against it.

In Europe, though, the pendulum of innovation was already swinging away from the high walls of concentric castles and cities. Gunpowder artillery may have been present by 1340, and it made itself felt at the Siege of Calais from 1346 to 1347. Gunpowder weapons became increasingly refined, until they became the primary means of siege warfare. In the early 1400's the English used them successfully against both Scottish and French cities. More dramatically, in 1453 the land walls of Constantinople were breached by Turkish bombards after a millennium of successful defense. The high walls of medieval fortification were now considered a liability, but they could not easily be abandoned. At first, many curtain walls were pierced to admit cannons to be fired outward, but this had limited success. Outworks began to appear so that defenders could keep besiegers distant with their own cannons. These low-profile embankments foreshadowed the future of fortification. Military architects began to propose a new style of defense: low-profile, wide walls that could hold artillery, even wider ditches to distance besieging artillery, and still more outworks, or bastions, to provide flanking fire. Italian cities were the first to adopt this new form of siege warfare. When French king Charles VIII (1470-1498) invaded Italy in 1494, his artillery made a shambles of the medieval defenses in his way, and the Italians adopted the new techniques.

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Steven Isaac

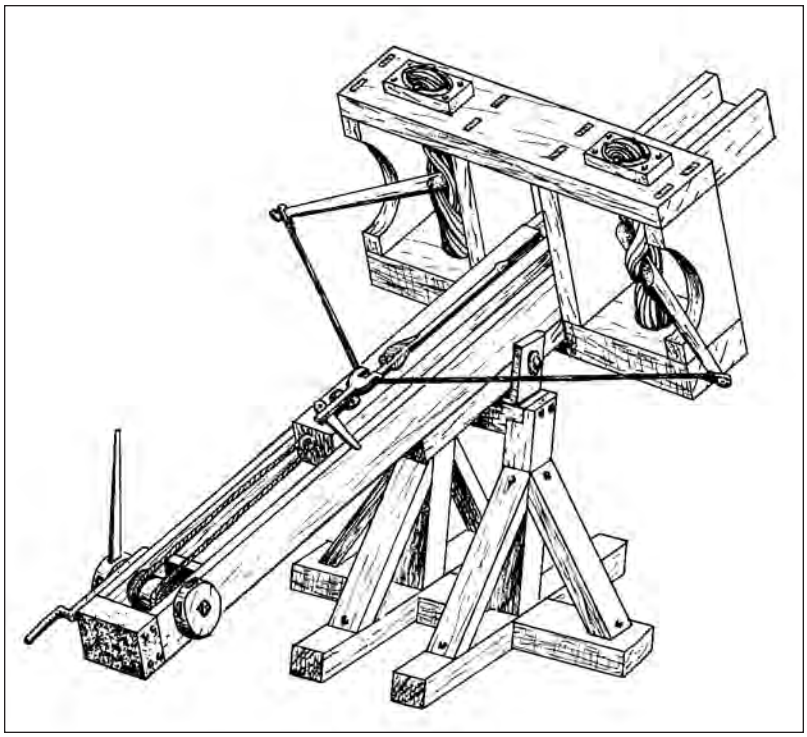
Sieges and Siegecraft
Ancient and Medieval
Dates: c. 7000 B.C.E.-1500 C.E.

Nature and Use

Siege warfare is the art of taking a fort or fortified city. In a passive siege, the besiegers attempted to starve the defenders by sealing off the city or fort from the outside world by circumvallation, which means encircling with a wall or rampart. Active siege tactics assaulted the fortifications by attempting to go over, through, or under the wall. The main weapons and tools for an active siege were ladders for climbing walls, drills and battering rams for punching through walls, and spades for undermining walls. Catapults and siege towers provided support.

Fortifications go back at least to Neolithic times. Seven thousand years B.C.E., the inhabitants of Jericho constructed massive fortifications that included a stone wall 3 meters thick and 4 meters high, a moat 3 meters deep and 9 meters wide, and a stone tower 8.5 meters high and 10 meters in diameter. By the time of the early civilizations in Mesopotamia and Egypt, the art of fortification had already been well developed. Walls featured balconies that allowed defenders to shoot straight down at the enemy, as well as towers and bastions from which defenders could rake besiegers with flanking fire. Gates were the most vulnerable points in a wall, and ancient architects spared no effort to secure them. Pilasters, bastions, towers, and balconies protected them. Metal plating covered the gates to prevent fire. Narrow, winding entryways made it more difficult for attackers to enter the city if they succeeded in breaking through the gate.

Although besiegers undoubtedly circumvallated cities almost from the beginning of siege warfare, the ancient Greek historian Thucydides (c. 459-402 B.C.E.) provides the first detailed account of the construction of a wall of circumvallation in the Siege of Plataea by Sparta and Thebes (429-427 B.C.E.) at the beginning of the Peloponnesian War (431-404 B.C.E.). A mile in circumference, it was a double wall



Kimberly L. Dawson Kurnizki

The Roman ballista, circa 50 B.C.E., a two-armed torsion weapon used to hurl large arrows or stones.

with space between in which to quarter troops. It took two and a half months to build. Battlements and towers strengthened the wall, and the digging of clay for the bricks left a moat on both sides. Plataea was thoroughly isolated but it held out for two and one-half years, revealing the weakness of passive sieges.

To shorten sieges, more aggressive methods were necessary. Escalade, or scaling, was perhaps the earliest means of overcoming fortified walls. A twenty-seventh century B.C.E. Egyptian wall painting at Dehashe shows soldiers trying to pry the gate open with poles while assault teams attack the wall with scaling ladders and archers attempt to drive the defenders from the wall. Escalade was not effective, however, against walls higher than 10 meters. The long ladders needed to scale greater heights were unwieldy and collapsed under the weight of too many soldiers climbing them.

Because walls in ancient Egypt and Mesopotamia rose as high as 20 meters, means other than escalade were necessary to assault them, and battering rams soon came into use. An Egyptian palette dating from around 3000 B.C.E. shows creatures that may be symbolic of battering rams attacking a wall. More clearly, a twentieth century B.C.E. Egyptian wall painting depicting a siege shows three men protected by a mobile hut using a long beam to pry stones from the wall. By the eighteenth century B.C.E. the Assyrians were deploying battering rams in integrated assault tactics that included the use of not only rams but also siege towers, siege ramps, and sapping, a method of undermining walls. Lack of remaining evidence precludes a clear picture of the earliest Assyrian rams, which were probably prying devices used to dislodge bricks from walls. It is not until the Neo-Assyrian Empire in the ninth century B.C.E. that Assyrian rams are seen in palace wall paintings. Assyrian emperor Ashurnasirpal II (r. 883-859 B.C.E.) deployed huge rams that required six wheels for support. A domed turret from which archers could fire protected the front of the ram, and wicker shields also covered the sides and front. The machine was about 5 meters long and from 2 to 3 meters high. The battering pole hung like a pendulum from a rope attached to the roof. It had a metal blade at the end, which the crew could jam between bricks to pry them loose from the wall. The wheels provided mobility, but the ram was so heavy it was difficult to maneuver. Future Assyrian emperors sacrificed weight for mobility, but Tiglathpileser III (r. 745-727 B.C.E.) used lighter four-wheeled rams that were more maneuverable.

Siege towers were in use in both Egypt and Mesopotamia at least by the early second millennium B.C.E. They rested on wheels or rollers and could be pushed forward into position, providing a means of crossing the wall by dropping a boarding bridge from the tower to the wall. They also gave archers and slingers a better angle of fire to drive the defenders off the wall.

The construction of siege ramps goes back to the third millennium B.C.E. Siege ramps helped attackers cross walls and provided a means of bringing battering rams across moats, outer walls, or slopes at the base of the wall known as glacis. They allowed attackers to attack the wall toward the top, where it was thinner than at the base. Ancient Babylonian mathematics problems show that engineers could calculate how long it would take them to construct a ramp. If these problems reflect reality, the Babylonians could build a ramp to the top of a 22-meter wall in five days with 9,500 men working at the task.

By at least the early second millennium B.C.E. Mesopotamian engineers had developed the art of collapsing walls by sapping. Sapping involved either boring through a wall or undermining it. To undermine a wall, sappers dug a tunnel and then set the support beams on fire to collapse both the tunnel and the wall above. The depth of the tunnel had to be exactly right; if it was too shallow, the weight of the wall might collapse the tunnel on top of the sappers, if it was too deep, it would not collapse when the support beams were burned.

The Assyrians were the first to develop tactically integrated siege armies. Siege warfare was like a giant construction project. The construction of siege towers and siege ramps and the undermining of walls required large amounts of manpower and the ability to organize labor. Assyrian siege armies deployed a variety of skilled troops—sappers, archers, slingers, assault troops, and battering ram crews—and Assyrian commanders knew how to coordinate them toward a common tactical purpose.

Development

The most important development in siege warfare was the invention of the catapult. The first catapult was probably invented by an unknown craftsman under the employ of the Greek tyrant Dionysius I of Syracuse (r. 405-367 B.C.E.). Dionysius had brought a large number of craftsmen from Sicily, Italy, and Greece to Syracuse to manufacture arms for his war against the Carthaginians in Sicily. One of them devised the *gastraphetes*, or belly bow, which is considered the first catapult. The archer could, by bracing the bow against his stomach, use both hands to pull back a slider with more strength than he could muster with one arm. A trigger, when pulled, then released the arrow. These catapults helped Dionysius take the city of Motya, a formidable Carthaginian stronghold on the west coast of Sicily, in 397 B.C.E. It is probable that winches were added to the gastraphetes early on to pull back the slider with mechanical power.

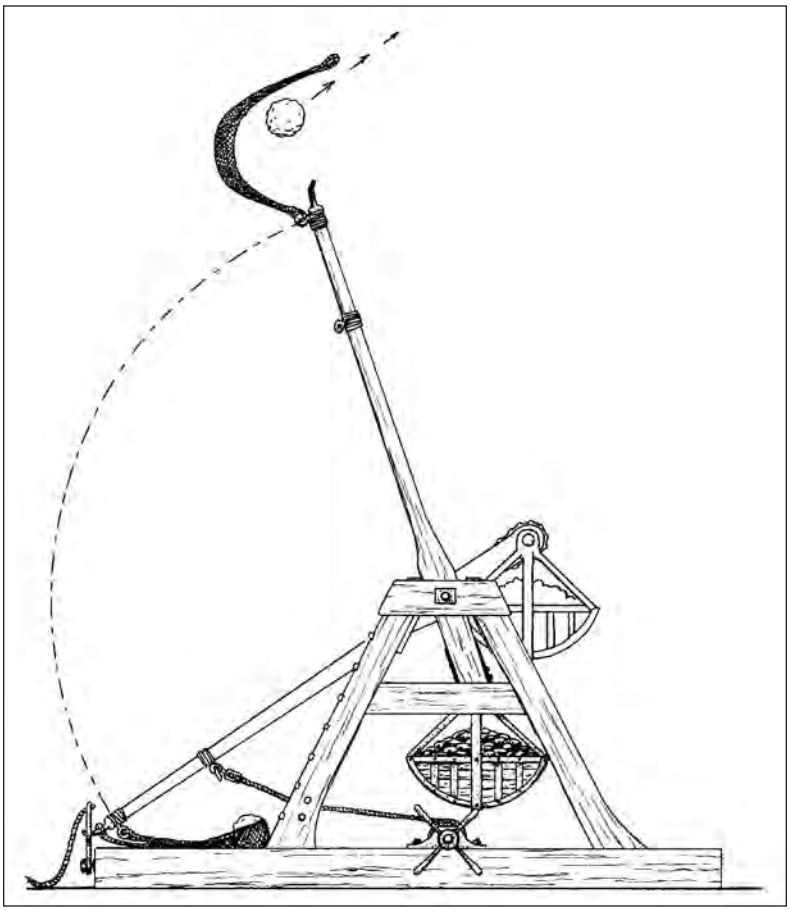
The next step in the development of catapults was the application of torsion power in which ropes were wound tightly with a windlass. The sudden release of the tension released a powerful burst of energy. Little is known about the origins of the torsion catapult. The Macedonian king Philip II (382-336 B.C.E.) used arrow-shooting torsion catapults that may have been invented by his engineers. Philip's son Alexander the Great (356-323 B.C.E.) deployed stone-throwing torsion catapults in the Siege of Halicarnassus in 334 B.C.E. Catapults more often strengthened the defense than the offense. For example, in the Roman Siege of Syracuse in 213 B.C.E. the Syracusans used catapults of various sizes to keep Roman ships away from their walls.

In Hellenistic times, siege warfare became more technical and the equipment more complicated. The Macedonian commander Demetrius Poliorcetes (336-283 B.C.E.) employed a huge siege tower called a *helepolis*, literally translated as "taker of cities," at the Siege of Rhodes in 305 B.C.E. Protected by iron plates, the tower rose nine stories and was large enough to carry catapults. Twelve hundred men pushed it forward on its eight iron-rimmed wheels. The helepolis provided cover for two gigantic rams. When the helepolis advanced, the Rhodians were able to knock loose some of its iron plating with stone-throwing catapults and set it on fire with flaming arrows shot from catapults. After repairs, Demetrius attacked again. The huge rams did batter down a part of the Rhodian wall, but Demetrius failed to take the city and, in the end, his acceptance of a negotiated end to the siege was a testimony to the difficulty of capturing a well-defended city.

Although the siege equipment of republican Rome was somewhat haphazard, siege machinery was a regular part of the Roman imperial army's equipment. Each legion was equipped with ten catapults as well as engineers and sappers. A Roman battering ram was a heavy beam with an iron head in the shape of a ram's head. The Romans used all sizes of cata-

Turning Points

c. 7000 B.C.E.	The inhabitants of Jericho construct massive fortifications around their city.
c. 1900 B.C.E.	Primitive battering rams are depicted in Egyptian wall paintings.
c. 1700 B.C.E.	Assyrians employ integrated siege tactics with rams, towers, ramps, and sapping.
c. 429-427 B.C.E.	A wall of circumvallation is used in the Siege of Plataea by Sparta and Thebes at the beginning of the Peloponnesian War.
c. 399 B.C.E.	The catapult is invented at Syracuse under Dionysius I, significantly advancing the art of siege warfare.
334 B.C.E.	Alexander the Great uses stone-throwing torsion catapults at the Siege of Halicarnassus.
305-304 B.C.E.	Macedonians employ a huge siege tower known as a helepolis during the Siege of Rhodes.
70 C.E.	Romans employ catapults during their Siege of Jerusalem.
1304	English king Edward I employs thirteen trebuchets at the Siege of Stirling



Kimberly L. Dawson Kurnizki

A drawing of a trebuchet, after Sir Ralph Payne-Gallwey (1842-1916), A Summary of the History, Construction, and Effects in Warfare of the Projectile-Throwing Engines of the Ancients *(1907). Such siege weapons of antiquity reappeared throughout the medieval period, as the building of castles proliferated.*

pults. In general Romans seemed to have called their smaller catapults *scorpions* and the larger ones *ballistae*, but there was no real consistency in the terminology. Later the word "onager" came into use to describe large catapults. "Onager" means "ass," and the catapults were so called because of the way the rear kicked up, like that of a donkey, when they were fired. Ancient historian Flavius Josephus (c. 37-c. 100 C.E.) claimed that Roman catapults were capable of throwing 25-kilogram stones to a distance of 366 meters at the Siege of Jerusalem in 70 C.E., although he probably exaggerated their range.

Medieval siege warfare evolved little from that of ancient times. The outstanding medieval innovation was the trebuchet, a stone-throwing catapult powered by a counterweight. The throwing arm rested on a pivot so that the end with the counterweight was shorter than the end throwing the missile. When released, the counterweight forced the short end down, lifting the long end with enough force to hurl a stone a considerable distance. The earliest trebuchets used men for counterweights. Several men would simultaneously pull on ropes with all their weight to force down the short end and propel the stone. By the early thirteenth century trebuchets with much heavier dead weights required fifty men to operate them and were capable of throwing a 100-kilogram stone about 150 meters. The biggest Roman catapults could throw a 30-kilogram stone about 225 meters.

Large trebuchets were expensive and relatively rare. In the Siege of Holyrood (1296) the English king Edward I (1239-1307) deployed three trebuchets, which threw 158 large stones in three days. In 1304 he used thirteen trebuchets to throw 600 stones during the Siege of Stirling.

Despite the impressive array of siege machinery, the reduction of powerfully fortified cities remained difficult throughout ancient and medieval times. Sieges were often time-consuming and expensive. Well-defended, well-provisioned cities could hold out for months or even years. Ancient armies fed themselves by foraging, and when they stopped moving, they soon exhausted food supplies in their immediate area, presenting siege commanders with difficult logistical problems. Siege armies labored in unhealthy circumstances. The disposal of human and animal waste was difficult. Disease was a major killer.

Against this background, psychological warfare was of great importance. Siege commanders tried to intimidate cities into surrendering by offering relatively lenient terms but threatening dire consequences if resisted. The common practices of sacking, rape, transportation, enslavement, and massacre added credibility to the threats.

Ruse and treachery were the preferred means of taking a city. The legend of the Trojan horse reflected the reality that often the only way to gain entry to a city was by trickery. The ancient historian Herodotus (c. 484-424 B.C.E.) tells the story of Zopyrus, a fanatically loyal Persian soldier who mutilated himself so that he could pose as an aggrieved deserter in order to gain entry to Babylon, which was under siege by the Persian emperor Darius (550-486 B.C.E.). Once in the city, Zopyrus opened the gate to the Persians.

Sieges placed cities under great stress, and siege commanders attempted to exploit any social or political fault lines in the hope that traitors would betray the city. This ploy was especially useful in Greek siege warfare. During the Peloponnesian War (431-404 B.C.E.), more cities fell by betrayal than by any other means.

The introduction of gunpowder in the fourteenth century brought an end to a long epoch in siege warfare, which had changed little since ancient times. By the fifteenth century cannon were a regular part of siege warfare for which stone walls were no match. Thus the ancient art of fortification was revolutionized and, with it, the art of siegecraft.

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Paul Bentley Kern

Armies and Infantry
Ancient and Medieval
Dates: c. 2500 B.C.E.-1400 C.E.

Nature and Use

Infantry is that part or those parts of an army trained and organized to fight on foot with handheld weapons. Foot soldiers have formed the largest component of most armies throughout history. Infantry forces are attested in ancient Mesopotamia, Egypt, Assyria, Greece, Rome, and China, where they were used both in battle and in assaulting and defending fortified positions.

Infantry forces were termed either "light" or "heavy," according to the weapons carried and armor worn by individual foot soldiers. Light infantrymen were equipped with little if any armor, and they used missile weapons such as javelins, bows, and slings to engage the enemy from a distance. Because of their greater mobility, light infantry units were effective in rugged terrain and using guerrilla tactics, but lightly armed soldiers could also be deployed as skirmishers fighting in front of or along the flanks of heavy infantry. Heavy infantrymen usually wore heavy defensive armor, carried weapons suited for close combat, such as swords and spears, and fought in dense, compact units. They were most effective in pitched battles fought on open plains.

In loosely organized armies foot soldiers often relied more on numerical superiority than on tactical maneuvering, achieving victory by simply overwhelming enemy forces. Infantrymen were most effective, however, when deployed in organized formations. The phalanx and the legion are the best known formations from ancient and medieval times. The phalanx was a square or rectangular formation in which foot soldiers stood shoulder to shoulder in files several ranks deep. When the soldiers of the front line locked their shields together, they presented an impenetrable wall capable of withstanding charges by chariots, cavalry, and even other infantry. On the attack members of a phalanx wielded either thrusting spears or pikes, and a well-disciplined phalanx could overrun many types of opposition. The phalanx was utilized with great success in antiquity by the ancient Greek city-states and the Macedonian Empire. In the fourteenth and fifteenth centuries Swiss pikemen readopted the phalanx to defeat mounted knights.

The legion was the basic infantry formation of the Roman army. Its size varied over time, but during the third and second centuries B.C.E. it consisted of 4,000 to 5,000 men, mostly heavy infantry. Legionaries wore a helmet and carried a tall body shield called the *scutum*. They carried a javelin (*pilum*) and sword (*gladius*) as close-combat weapons. Unlike the phalanx, the legion did not fight in a single massed formation. Each legion was subdivided into several smaller tactical units usually deployed in three lines that attacked in successive waves. Mobile and flexible, the Roman legion proved to be the preeminent infantry force of the ancient world.

Development

Written records of battles from ancient Egypt and the kingdoms of the Middle East frequently mention infantry, but it is difficult to determine what role foot soldiers played and how important they were in combat. The Sumerian Stela of the Vultures, dating from about 2500 B.C.E., depicts spearmen in a phalanx-like formation, but during the second millennium B.C.E. infantry may have fought primarily as skirmishers in support of chariots. One theory holds that the foot soldiers rose in prominence only around 1200 B.C.E., when "barbarian" tribes, fighting on foot and armed with javelins and long swords, overran many of the

kingdoms of the ancient Middle East. A similar transition away from chariot warfare to infantry began to occur in China in the fifth century B.C.E.

The Assyrians organized their infantry into specialized units in the early first millennium B.C.E., but the armies of the ancient Greek city-states were the first to rely almost exclusively on soldiers fighting on foot. Around 700 B.C.E. they began to deploy infantrymen called hoplites in densely packed phalanxes. Each hoplite wore a bronze helmet, corselet, and greaves, or shin guards. He carried a circular shield for protection and used a thrusting spear as his primary weapon. The phalanx was suited to the small plains of Greece, and in battle it attacked in tight formation. As they neared the enemy, hoplites in the front ranks of the phalanx raised their shields and spears and jabbed at their opponents, while those in the rear pushed on the backs of those ahead of them. Hoplite battles resembled shoving matches, as a phalanx sought to overwhelm its opponent by its momentum. The success of the phalanx ultimately depended on the cohesion of its members.

The superiority of the Greek hoplite army was demonstrated first at the Battle of Marathon (490 B.C.E.), where the Athenian hoplite phalanx charged and defeated a numerically superior but more lightly armed Persian force. A second Persian campaign against Greece met a similar fate during the Greco-Persian Wars (499-448 B.C.E.). Spartan hoplites held the narrow pass of Thermopylae (480 B.C.E.) for several days against vastly superior Persian numbers, and at Plataea (479 B.C.E.) a hoplite army drawn from Sparta, Athens, and other Greek city-states defeated the Persians decisively. Greek hoplites remained the elite warriors of the Mediterranean world for nearly a century and a half.

Turning Points

c. 1200 B.C.E.	The use of the chariot in warfare declines and foot soldiers increasingly come into use, as "barbarian" tribes, fighting on foot and armed with javelins and long swords, overrun many ancient Middle Eastern kingdoms.
c. 700 B.C.E.	Tight-formation hoplite tactics, well-suited to the small plains of the ancient Greek city-states, are first introduced in Greece.
c. 350 B.C.E.	Philip II of Macedon develops the Macedonian phalanx and adopts the use of the sarissa, a pike of nearly 15 feet in length wielded with two hands.
58-45 B.C.E.	Julius Caesar employs independently operating cohorts in the Gallic Wars and the Roman Civil Wars against Pompey.
3d-4th cent. C.E.	Despite the increasing role of cavalry due to barbarian influence, infantry remains the dominant component of the Roman legions.
476	The Sack of Rome by barbarians brings about an "age of cavalry," during which foot soldiers play a diminished role in warfare.
1298	The English army uses the longbow to great effect against the Scots at Falkirk.
14th cent.	An "infantry revolution" spurred by the greater use of the pike and bow, takes place in Europe.
1315	Swiss pikemen begin a string of victories against mounted knights by defeating the Austrians at Morgarten.

The prominence of infantry battle in Greek warfare declined somewhat during the Peloponnesian Wars (431-404 B.C.E.), which pitted the naval strength of Athens against the land-based power of Sparta. Few infantry battles were fought, and the war was ultimately decided at sea. Decisive hoplite battles did take place during the fourth century B.C.E., but new developments changed the face of Greek warfare. At Lechaeum (390 B.C.E.), on the Gulf of Corinth, a force of peltasts, light infantry armed with javelins, decimated a Spartan regiment and illustrated the vulnerability of heavy infantry to light-armed troops. At Leuctra (371 B.C.E.) the Theban commander Epaminondas (c. 410-362 B.C.E.) employed novel tactics to defeat the Spartan phalanx. Epaminondas strengthened the left wing of the Theban phalanx to a depth of

fifty men and charged the Spartans at an oblique angle. The weight of the Theban left flank ripped through the Spartan line, and the supremacy of the Spartan hoplite was ended forever.

More significant were the innovations of Philip II of Macedon (382-336 B.C.E.), who reformed the Macedonian army, including its infantry. Philip increased the depth of the Macedonian phalanx and reduced the size of the shield carried by its members. He also armed his infantry with sarissas, pikes nearly 15 feet in length and, unlike the spears of the Greek hoplites, wielded with two hands. At Chaeronea (338 B.C.E.) Philip combined the new Macedonian phalanx with his cavalry to rout a hoplite army of Thebans and Athenians. Philip's son, Alexander the Great (356-323 B.C.E.), employed similar combinations of infantry and cavalry charges at Granicus (334 B.C.E.), Issus (333 B.C.E.), and Gaugamela (331 B.C.E.) to break the Persian army and conquer the Persian Empire. The size of the Macedonian phalanx grew in the armies of the Hellenistic kingdoms founded after Alexander's death, but infantry was increasingly used in conjunction with other forces, including chariots and elephants.

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A Greek hoplite, circa 700 B.C.E., wearing a bronze helmet, corselet, and shin guards, and carrying a circular shield and a thrusting spear.

As the Greeks and Macedonians employed phalanx tactics, the Romans developed a style of infantry warfare based on the legion. The legion evolved over the course of the Roman conquest of Italy in the fifth and fourth centuries B.C.E. Its heavy infantrymen were deployed in three lines, each made up of ten units called maniples. In battle the first line of maniples, the *hastati*, advanced first. When they neared the enemy they released their javelins and then drew their swords and charged, seeking to take advantage of the confusion caused by their missiles. If the hastati failed to defeat the enemy, they were joined by the second line of maniples, the *principes*, which used similar tactics. The third line of maniples, the *triarii*, were armed as spearmen, and they engaged only when the situation became critical.

With their legionary tactics, the Romans overcame the peoples of Italy and the western Mediterranean. Roman legions, however, were not invincible, and the Roman infantry met defeat in battles against Pyrrhus

and in the Second Punic War (219-202 B.C.E.) against the Carthaginian general Hannibal (247-182 B.C.E.). The Romans were able to draw on enormous reserves of manpower to replenish their losses, and they learned from their defeats. They lost battles but won wars. In the second century B.C.E. the experience gained by decades of fighting in Italy helped Roman infantrymen defeat the Macedonian phalanx in the Second and Third Macedonian-Roman Wars (200-196 B.C.E., 172-167 B.C.E.). Thus, although the Macedonian phalanx initially carried all before it at the Battle of Pydna (168 B.C.E.), it lost cohesion as it advanced, allowing Roman legionaries to pour into gaps in its line and cut down the Macedonians at close range with their swords.

The Roman legion underwent further reforms during the second century B.C.E., and by the time of the general Gaius Marius (157-86 B.C.E.) ten cohorts had replaced the thirty maniples as the legion's tactical units. With the change to cohorts the distinctions between hastati, principes, and triarii disappeared, so that all legionaries were armed and fought in the same fashion. The legion continued to deploy for battle in three lines, with four cohorts in the first line and three cohorts in the second and third, but this arrangement could be varied, and unlike maniples, individual cohorts could operate independently. Julius Caesar (100-44 B.C.E.) employed cohorts very effectively in the Gallic Wars (58-51 B.C.E.) and in the Roman Civil Wars against Pompey (49-45 B.C.E.).

Under the Roman Republic, the infantry of Rome's legions was an offensive force. With the establishment of the Empire, Roman infantry forces acquired a defensive role. Rome's legions manned the frontiers of the Roman Empire and engaged in few pitched battles in the first few centuries C.E. The size of the legion decreased, and legionaries discarded their heavy armor and adopted missile weapons. Cavalry acquired a more important role in Rome's armies as a result of barbarian incursions across the Empire's borders during the third and fourth centuries C.E. Infantry remained the dominant component of the legion into the fourth and fifth centuries C.E., and in pitched battle Roman foot soldiers were vastly superior to their barbarian counterparts, as demonstrated in 357 C.E., for example, at Strasbourg, then called Argentoratum. Even the defeat of the Roman army at Adrianople (378 C.E.) was due largely to the flight of the Roman cavalry, not to the weakness of its infantry. After that point, however, foot soldiers became increasingly dependent on mounted soldiers, and cavalry gradually assumed a more decisive role.

The millennium following the fall of the Roman Empire is sometimes labeled an age of cavalry. Although cavalry charges often determined the outcome of battle, it would be a mistake to discount altogether the importance of foot soldiers in this period. Frankish armies fought on foot well into the time of Charlemagne (742-814 C.E.), and Anglo-Saxon armies in England relied on foot soldiers up until the Battle of Hastings (1066 C.E.). Well-disciplined infantry could also withstand a charge of mounted knights, as did the Milanese at Legnano (1176 C.E.). Something of an infantry revolution, however, took place in the fourteenth century, spurred in part by the greater use of the pike and bow. At Courtrai (1302 C.E.) Flemish infantry, armed with pikes, withstood a charge of French cavalry and then slaughtered the knights who had fallen from their mounts. In 1314 English cavalry suffered a similar fate against the Scottish pikemen at Bannockburn. Use of the crossbow, capable of piercing the armor of a mounted knight, had also begun to challenge the supremacy of cavalry during the twelfth century, but the longbow proved more effective in terms of cost, rate of fire, range, and accuracy. By the late thirteenth century a majority of English foot soldiers carried the longbow, and their large numbers proved decisive against the Scots at Falkirk (1298), and later in the Hundred Years' War (1337-1453) against the French at Crécy (1346), Poitiers (1356), and Agincourt (1415).

The most significant infantry innovation was the development of the Swiss phalanx. Swiss infantrymen wore little armor and carried no shields, but they carried either a pike 18 feet in length or a halberd, both of which were wielded with deadly effect. After infantrymen in the outer ranks of the phalanx delivered the initial blows with their pikes, soldiers armed with halberds emerged from the phalanx and engaged enemy cavalry and foot soldiers at close quar-

ters. When harassed on all sides by cavalry, the Swiss phalanx could also adopt a "hedgehog" formation, with pikes turned outward in all directions. A string of Swiss victories over mounted knights began early in the fourteenth century at Morgarten (1315) and by the end of the fifteenth century, European monarchs were either recruiting Swiss infantrymen into their armies or modeling their own infantry units after the Swiss. Infantry had again come to dominate Western warfare.

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James P. Sickinger

Cavalry
Ancient and Medieval
Dates: To c. 1500 C.E.

Nature and Use

Historically, cavalries were military forces that traveled and fought on horseback, unlike mounted infantrymen, who traveled on horseback but fought on foot, and charioteers, who fought from carts pulled by horses. Cavalry was less expensive and more mobile than was chariotry and could move two to three times faster than could infantry, covering at least 30 to 40 miles a day for an indefinite period. The physically and psychologically imposing combination of man and horse made resistance difficult for foot soldiers.

Cavalry in antiquity fell into two basic categories: light cavalry, unarmored or lightly armored men on small, swift ponies or horses, and heavy cavalry, moderately or heavily armored men on large, sometimes armored, horses. The principal cavalry weapons were the composite bow, javelin, and lance. Almost every cavalryman used at least one of these weapons; light cavalrymen emphasized the bow or javelin and heavy cavalry the lance. However, many other combinations of weapons were used. On the march, light cavalry would scout ahead, protect the flanks and rear of their army, and raid enemy forces. In camp, at sieges, or on garrison duty, cavalry would patrol and undertake escort duties. In battle, light cavalry would ride at the enemy, fire missiles, and then gallop out of the range of return fire. Skilled horse archers could turn in their saddles and fire while withdrawing, a maneuver known as the Parthian shot, for the Parthians (third century B.C.E.), a nomad steppe people who perfected the technique. Heavy cavalry would mass and charge enemy forces, hoping to rout them. If this happened, the light cavalry would pursue. If things went badly, the light cavalry would instead try to cover the retreat of friendly forces. Finally, cavalry and mounted infantry used the horse's high march rate to perform raids. After short-range raids, the raiders quickly returned to the safety of their border forts. In long-distance raids, traversing hundreds of miles of enemy territory, the raiders used speed and unexpected movements to avoid interception.

The first known cavalry appeared in the Near East, around 1200 B.C.E., after the collapse of the Bronze Age civilizations there. Armies dominated by cavalry were fielded by Eurasian steppe nomad groups, such as the Cimmerians, Scythians, Sarmatians, Huns, Avars, Turks, and Mongols. Combined forces of cavalry and infantry were fielded by the agricultural peoples of Europe, Asia, and North Africa, notably the Assyrians, Achaemenid Persians, Greeks, Macedonians, Celts, Spaniards, Numidians, Carthaginians, Romans, Chinese, and Indians. Cavalry enjoyed a dominant position in the armies of many peoples, beginning with the Parthians and Sāsānian Persians and continuing with the Byzantines, Arabs, Russians, and medieval Europeans.

Development

The horse was first domesticated and ridden six thousand years ago by the Sredni Stog culture of the North Pontic region in the modern Ukraine. The development of horseback riding and, several centuries later, the wheeled cart allowed nomads to exploit the resources of the prairie steppe that runs from Hungary past the Ural and Altai Shan Mountains of Central Asia to Mongolia and Manchuria in the east. Because chariotry preceded cavalry everywhere in the Bronze Age, the first mounted warriors probably fought dismounted, adopting the chariot because it allowed

TURNING POINTS

c. 4000 B.C.E.	Horses are first domesticated and ridden by people of the Sredni Stog culture.
c. 900 B.C.E.	Cavalry begins to compete with chariotry as a method of warfare in the Neo-Assyrian Empire.
c. 4th cent. B.C.E.	Earliest known stirrups, made from leather or wood, are used by the Scyths.
c. 3d cent. B.C.E.	The Parthians, a steppe nomad people, perfect the Parthian shot, fired backward from the saddle while in retreat.
333 B.C.E.	Alexander the Great uses combined infantry and cavalry forces to route the Persian cavalry at the Battle of Issus.
53 B.C.E.	Parthian horsemen devastate the Roman legions at the Battle of Carrhae.
50 B.C.E.-50 C.E.	The earliest horseshoes are made in Gaul.
400	Horseshoes come into general use throughout Europe.
1100	European knights adopt the use of the couched lance, which provides more force than previous hand-thrust weapons.
1260	Mongol warriors are defeated at the Battle of Ain Jalut by Mamlūk slave cavalry, trained by the Egyptians to steppe nomad levels.

them to fight on foot, as they were accustomed, and leaving control of the horses to the charioteers. Armed riders are depicted in late Bronze Age (c. 1550-1200 B.C.E.) Greek, Egyptian, and Near Eastern art, but they appear sitting "donkey seat," on the animal's rump, not up on its shoulders: an inefficient position that is also harmful to the horse. It is likely such riders were only scouts or messengers, armed for self-defense.

After the collapse of the Greek and Near Eastern Bronze Age civilizations (around 1200 B.C.E.), cavalry gradually began to replace chariotry. The process is clearly depicted in reliefs of the Neo-Assyrian Empire (911-612 B.C.E.). The earliest cavalrymen, of the ninth century B.C.E., unarmored and still sitting donkey seat, were chariot riders on horseback. The "chariot warrior" wielded a bow, and the accompanying "charioteer" managed the reins of both his own and the bowman's horses and carried a shield and spear for self-defense. By the mid-eighth century B.C.E., each horseman controlled his own mount, sat on the horse's withers, used lances as well as bows, and, in some cases, wore lamellar corselets as body armor. By the end of the eighth century B.C.E., corseleted cavalrymen equipped with both bows and lances appeared, supported by horse archers. Half a century later, horses were outfitted with cloth armor similar to that of chariot horses.

CAVALRY ACCOUTREMENTS

Like most cultures in and after the ninth century B.C.E., the Sredni Stog culture managed its horses by directly controlling their heads, using reins connected to bits held in place in the horses' mouths by antler cheekpieces attached to bridles. Even this was not always necessary; the Numidians, raised on horseback, controlled their small, swift, and obedient Libyan steeds with only a stick or cord around the neck. Throughout the first millennium B.C.E., most horsemen rode either bareback or seated upon a saddle cloth. The first saddles, consisting of a pad with two cushions resting on either side of the horse's spine and held on by a girth, appeared around 400 B.C.E., used by nomads in the Altai Shan Mountains of central Asia. It took five centuries for saddles to become commonplace. Whips or goads were favored by Asian horsemen, but spurs were used in Greece during the fifth century B.C.E. and in Celtic lands soon afterward.

To protect horses' hooves from the wet conditions of the northwestern European climate, the Celts began making horseshoes. The earliest horseshoes were made in Gaul between 50 B.C.E. and 50 C.E., and horseshoes also enjoyed some popularity in Roman Britain. Elsewhere in the Roman Empire, temporary "hipposandals" of woven grass or leather and metal predominated. Horseshoes did not come into general use until after 400 C.E.

The earliest known stirrups, made of leather straps

or wood, or featuring metal hooks, appear in Scythian contexts in the fourth century B.C.E. and in India around the end of the first millennium B.C.E. Although stirrups may have been a necessity for the heaviest cavalry forces, they were rarely depicted in art of the period, perhaps because men reared in the saddle found the use of stirrups embarrassing. Only in fourth century C.E. China was the full metal stirrup adopted; by the seventh century C.E. it had made its way west with the Avars. Although none of the aforementioned inventions can be demonstrated clearly to have had a decisive impact upon cavalry operations during the first millennium C.E., they must have made the creation of mounted forces easier for peoples unaccustomed to riding, such as the Chinese and the Franks.

By around 1100 C.E., Western European knights had discovered the use of the couched lance. Held onto the horse by a high saddle and stirrups, the knight could hold the lance firmly under his arm, adding far more force to the blow than any thrust by hand could do. However, because the massed charge of Western European knights had long been considered irresistible by their Byzantine and Arab foes, the couched lance would seem to be only a tactical refinement, not a decisive advance.

CAVALRY DEVELOPMENT IN CIVILIZED NATIONS

There were two general lines of development in cavalry: that of the civilized nations of the Mediterranean and that of the steppe nomads and those who imitated them. For the first group, the problem was in integrating cavalry into armies that were composed predominantly of infantry. The Achaemenid Persians, who reigned from 560 to 330 B.C.E., followed the Assyrians' example and used light foot archers

Kimberly L. Dawson Kurnizki

A Parthian horse archer of the third century B.C.E. practicing the Parthian shot, a maneuver in which the rider turns in his saddle and fires while withdrawing.

and spearmen with missile-armed cavalry that did not try to charge massed infantry forces. This combination worked well in the Near East but failed in offensives against the Greeks and the steppe nomads.

The Greeks themselves came to realize by the fourth century B.C.E. the value in the coordinated use of heavy and light infantry and cavalry together. Macedonian conqueror Alexander the Great (356-323 B.C.E.) used this strategy in the eventual defeat of the Achaemenid Persians. Alexander's heavy, pike-armed infantry provided a solid base, and the light-infantry provided missile fire wherever needed. Thessalian light cavalry, armed with javelins, guarded his left flank, and other light cavalry were positioned on the far right flank. The elite Companion heavy lancers and supporting *hypaspist* infantry massed farther in on the right. At both Issus (333 B.C.E.) and Gaugamela (331 B.C.E.), after the other units had drawn out the enemy, the Companions charged into the Persian left flank cavalry, ruptured the enemy line, and then rallied and charged into the enemy flanks and rear, achieving the victory in both battles.

Alexander's "combined arms" approach was adopted by the Carthaginians and, eventually, by the Romans as well, after the Carthaginian general Hannibal (247-182 B.C.E.) had demonstrated its effectiveness. Although the Romans experimented with heavy cavalry, they generally preferred light cavalry, relying upon their superb legion infantry for shock action.

CAVALRY DEVELOPMENT AMONG STEPPE NOMADS

The second main line of cavalry development occurred among the steppe nomad peoples, who enjoyed far more pasturage than did the peoples of Western Europe, the Mediterranean region, and China. Because the steppe nomads spent so much time on horseback, their armies were dominated by cavalry, a tactical development imitated by Iranian monarchies and Chinese dynasties. The Cimmerians, a people who inhabited southern Russia and were driven to Turkey by the Scythians in the eighth century B.C.E., were the earliest known steppe nomad horse archers. As evidenced by later steppe nomad tactics, these people probably stressed hit-and-run attacks from front, flanks, and rear by small, scattered bodies of horse, using feigned retreats and ambushes to draw out and destroy enemy forces. As the Cimmerians passed over the Caucasus in the eighth century B.C.E., they wrecked kingdoms throughout Anatolia before finally being destroyed. Their Scythian and Sarmatian successors fielded both light-armed horse archers and heavy cavalry, equipped with lances and armor covering man and, often, horse as well. Such heavy cavalrymen, called *cataphracts* by the Greeks, would charge and rout enemy forces already weakened by the horse archers' attacks. The Parthians, a steppe people who seized Persia from the Macedonians, exploited the matchless advantages of Iran's wide pasturelands and unique Nisaean breed of horse—larger and better bred to carry weight than most steppe or western animals—to field numerous cataphract and horse archer units. The effectiveness of the Parthian force was displayed in 53 B.C.E., when a Roman army under Marcus Licinius Crassus (115-53 B.C.E.) invaded Parthian territory at Carrhae. Commanded by a noble known as Surenas, the Parthians lured Crassus into open desert terrain, where Parthian horse archers shot his infantry to pieces. When Crassus's Gallic horses charged to drive them off, the cataphracts countercharged and crushed them. The Roman army was destroyed, and Crassus killed.

THE RISE AND FALL OF CAVALRY

Parthia, not Rome, influenced the development of cavalry over the next millennium. In the late Roman Empire and its Byzantine successor in the East, the balance tilted in favor of the horse, with infantry forming a defensive body in battle and serving chiefly as a refuge for the cavalry. Others who adopted this pattern were the Indians; the Chinese; the Arabs, who quickly moved from camels to horses; and, more gradually, the European peoples as well. Whether the adoption of saddle and stirrup drove this development, or was driven by it, is unclear. Heavy cavalry service eventually became a justification for aristocratic political power and encouraged cavalry's growing predominance. However, large infantry forces were still needed, if only for siege warfare. Thus, aside from cavalry raids such as the long-

distance *chevauchées* of the Hundred Years' War (1337-1453 C.E.), offensive operations necessarily tied cavalry to an infantry pace. The Mongols under Genghis Khan (died 1227 C.E.) solved this problem: Their armies of highly trained, fast-moving horse archers and cataphract lancers simply rounded up local peasants by the thousands and forced them to perform siege warfare duties. The epitome of steppe nomad armies, the Mongols were hindered only by environmental factors and internal political problems until they suffered their first defeat in 1260 C.E. at Ain Jalut, Israel, at the hands of the Mamlūks, Egyptian slave cavalry, trained to steppe nomad levels. Toward 1500 C.E., infantrymen began to return to prominence in Europe; notable examples are the English longbowmen, Swiss pikemen, and Hussite *Wagenburg* soldiers. The development of gunpowder artillery and firearms ultimately spelled the end of cavalry dominance in Europe and, eventually, everywhere that European armies marched.

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Warships and Naval Warfare

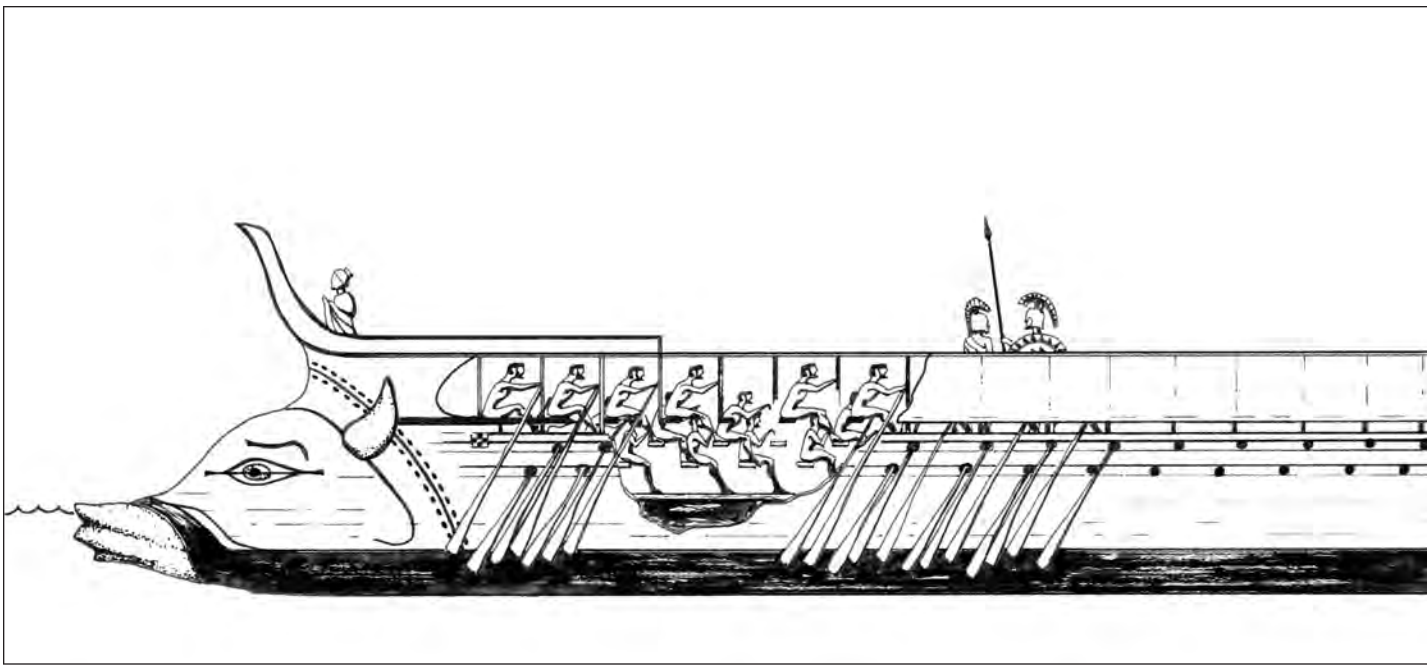
Dates: To c. 1200 C.E.

Nature and Use

From ancient times, the principal warship of the Mediterranean Sea was the oared galley, which was used to ram and sink opposing ships. The galley typically had fore and aft decked platforms with a lower, usually open, area for the rowers. The galley was built using a "shell-first" construction, in which the planks of the galley's hull were edge joined with mortise-and-tenon joints, to which a system of frames was later inserted. Joints typically were made out of oak for strength, and the other sections were constructed from lighter woods, such as pine or fir, for speed. From the bow of the vessel at its waterline projected a sharp beak, or ram, usually made of bronze, which was used to puncture the sides of opposing ships and cause them to sink.

Control of the sea and protection of merchant shipping were important for many Mediterranean civilizations. Although the Phoenicians and Etruscans previously had developed navies to defend their trading interests, the Greek city-state of Athens was the first to actively use its navy in efforts toward imperial expansion. Even a largely land-based power such as Rome was eventually forced to develop a navy to deal with naval threats such as the Carthaginians and the Vandals.

The oared galley also predominated in the Atlantic Ocean for many centuries. Raiders such as the Vikings used their oared galleys, known as longships, to make raids along the coast of Europe. In response to the more strenuous maritime conditions along the



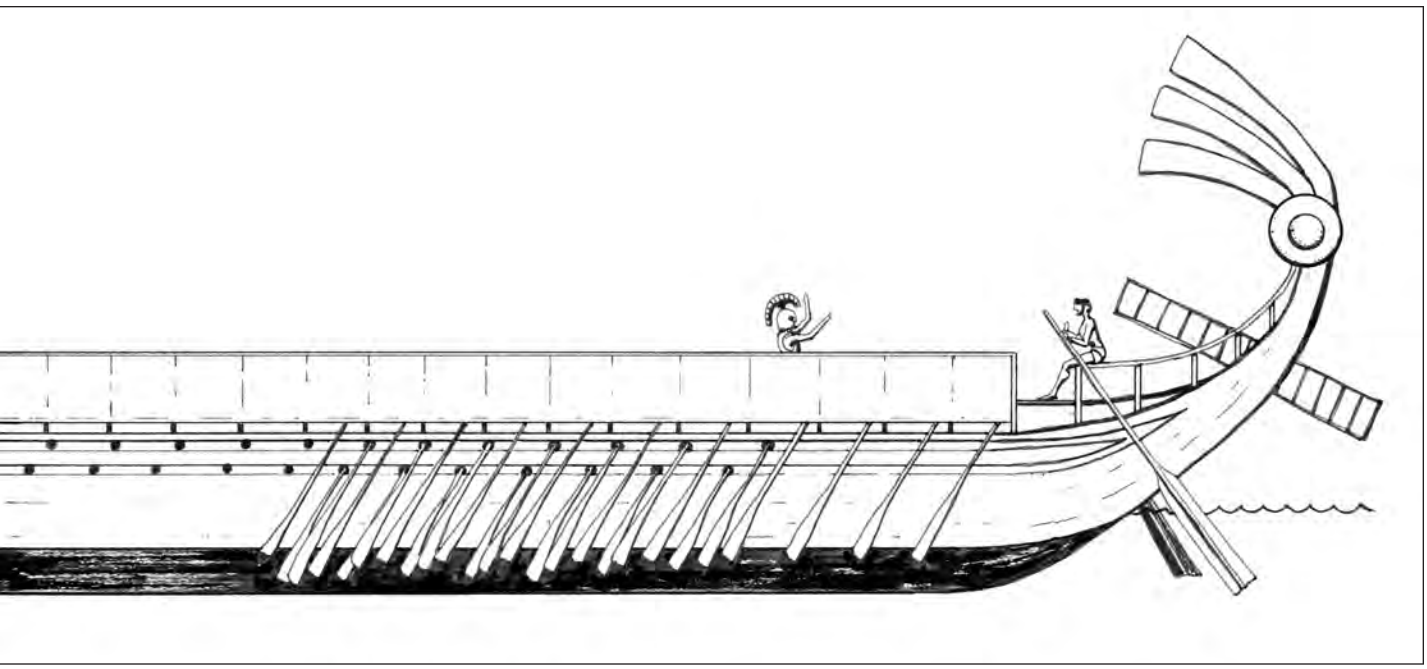
A Greek trireme, which employed three banks of rowers to achieve the superior speed, handling, and power that enabled Athens's growth as an imperial power in the mid-fifth century B.C.E.

coast of northern Europe, these vessels did not use mortise-and-tenon joints, but instead were clinker-built. Clinker-built construction, sometimes called clench-built construction, is a method of shipbuilding in which overlapping planks are fastened to one another using wooden pins, called treenails, or iron clench nails. Next, a form of caulking, consisting of animal hair dipped in pitch to prevent leaking, is placed in the seams between the planks.

The oared galley remained the dominant warship until the development of the cog in the thirteenth century C.E. The cog was a large merchant vessel associated with the development of the Hanseatic League, a commercial union of German, Dutch, and Flemish towns. It had very high sides and a flat bottom and was propelled by a single square sail. Although the cog was a poor sailer, its high sides offered protection against smaller oared vessels, such as the Viking longships. The addition of fighting castles at the bow and stern allowed the vessel to be used to fight wars and blockade towns. The cog was soon replaced, however, by the carrack, a sailing ship with multiple masts and a combination of square and lateen, or triangular, sails. The carrack was a very efficient sailing vessel that became popular in both the Atlantic and the Mediterranean. After cannons were added to the carrack, many Western European countries utilized the vessel to become worldwide naval powers.

Development

The Greek civilization was one of the first to develop naval power. The first Greek warships, consisting of a single level of oarsmen with one rower per oar, were called *triacontors* and *pentecontors* (thirty- and fifty-oared ships). By the end of the eighth century B.C.E., a second level of rowers was added, in an effort to improve the vessel's speed and to increase the force of the collision between the vessel's ram and the opposing ship. After the addition of a third row of oarsmen in the late seventh century B.C.E., the resulting vessel was known as a trireme. According to the Greek historian Thucydides (c. 459-c. 402 B.C.E.), the trireme was invented by a Corinthian named Ameinocles. However, other ancient sources credit



Kimberly L. Dawson Kurnizki

TURNING POINTS

c. late 7th cent. B.C.E.	The Greeks develop the trireme, a large ship powered by three rows of oarsmen.
c. mid-5th cent. B.C.E.	Athens establishes itself as a major naval power in the Mediterranean.
c. 4th cent. B.C.E.	Onboard catapults are added to ships, effectively rendering them as floating siege engines.
c. 3d cent. B.C.E.	Romans utilize the corvus, a nautical grappling hook, allowing sailors to board and capture opposing vessels.
674-678 C.E.	Greek fire, a flammable liquid, is used by the Byzantines against Arab ships during the Siege of Constantinople.
mid-13th cent.	The cog, with high sides that offer protection against other vessels, is developed in Northern Europe.
mid-14th cent.	The carrack, an efficient sailing ship with multiple masts, becomes popular in Atlantic and Mediterranean waters.

the Sidonians with the innovation. Because only the wealthiest cities could afford to build and maintain a trireme, these vessels were not used extensively for several centuries, after which the Phoenicians and Egyptians began to incorporate triremes into their fleets. It was during Athens's growth as an imperial power in the mid-fifth century B.C.E. that the superior speed, handling, and power of the trireme firmly established its position as the premier warship.

The design of the trireme slowly evolved during the Hellenistic Age into that of a much larger and bulkier vessel. To increase the ship's speed and power, extra men were added to each bank of oars, leading to quadriremes and quinqueremes. A quadrireme was not a vessel with four banks of oars, as the prefix "quad-" suggests, but rather it was a trireme with a top row of oars with two oarsmen to each oar and two lower rows of oars, each manipulated by one man. A quinquereme, also known as a *pentereis*, or a "five," had two rows of oars manned by two men and one row manned by one. The new configuration of oars and oarsmen brought about several changes in the design of the vessel's hull, among which was its increased breadth. The longer oar length changed the stroke of the oarsmen. Because a seated stroke did not allow the full power of the oar to be utilized, a full stroke had to be performed from a standing position by the man on the inside end, as the oar rose and fell during the course of one revolution. More room between decks was also needed, as the men were standing instead of sitting. These adjustments led to larger and larger ships.

CONSTRUCTION OF LARGE SHIPS

Among the most important reasons for the construction of larger ships were technological advances in weaponry. The torsion catapult had been invented around 400 B.C.E. but did not play an important role until the campaigns of Alexander the Great (356-323 B.C.E.). A logical next step was the mounting of catapults on board galleys to use against other ships, as seen in the famous battle for Cyprus between Demetrius Poliorcetes (336-283 B.C.E.) and Ptolemy in 306 B.C.E. To mount the catapult, a larger ship and a sturdier deck, to absorb the weapon's recoil, were needed. Because smaller ramming ships were easy prey for long-range weapons, warships were built larger to offer protection from aerial bombardment. As the ships became larger, however, their mobility was retarded. This gigantism saw the construction of "sixteens," "twenties," and "thirties," and culminated in the huge ship constructed by Ptolemy IV around 200 B.C.E., which was referred to in the ancient literature as a "forty."

When Demetrius Poliorcetes attacked Rhodes in 305 B.C.E., he was forced to experiment with new naval tactics, in response to the strength of the city's defenses. To attack the harbor, he built a floating siege machine that was mounted on the hulls of two cargo ships. He constructed four towers, or "penthouses," for use against the harbor's fortifications. These penthouses were taller than the city's harbor towers and permitted arrows and javelins to be directed at the defenders manning the harbor towers. Demetrius

Poliorcetes also planked over several of his lighter boats, into which he placed archers and catapults, who fired through ports that could be opened and closed.

During the First Punic War (264-241 B.C.E.) Rome found that, despite the strength of its army, its Carthaginian opponent was a superior naval power. In response, the Romans utilized the *corvus*, or raven, a nautical grappling hook. This device was simply a long, spiked gangplank mounted on the bow of a Roman warship and dropped onto the deck of a Carthaginian ship, securing the two ships together and allowing a Roman contingent to board and capture the opposing vessel.

After its final defeat of Carthage in the second century B.C.E., the Roman navy began a slow decline in strength. The only real need for a continued naval presence was the protection of merchant ships, especially the annual grain ships coming from Egypt, from piracy. The large quadremes and quinqueremes of the Hellenistic Age were phased out, and smaller, faster ships better able to combat the pirates were increasingly produced. New vessels, such as the *liburnian* and the *dromon*, were introduced into the Imperial fleet and soon replaced the trireme as the main warship of the Roman navy.

The Dromon

The dromon was built for a specific purpose: to combat a different type of enemy than had the trireme, which was typically used against other triremes in pitched naval contests. During the years of the Roman Empire, vessels became smaller and faster. A military vessel was needed that could catch these smaller vessels and still be powerful enough to fight in large-scale naval battles against organized opponents. The dromon, with its various capabilities, was the solution. It was fast—in fact, its name means "runner" in Greek—yet it was still large enough to carry the weapons required during large naval conflicts.

Perhaps the best-known offensive weapon of the Byzantine fleet was "Greek fire," invented by a Syrian, Callinicus, in Constantinople and used in 674-678 C.E. during the first Arab siege of Constantinople. Greek fire was a flammable liquid that would supposedly burn even in water. It was shot through a metal tube, or siphon, onto enemy ships, causing them to catch fire. Most Byzantine ships had a siphon, protected by the forecastle, mounted at the bow. Larger vessels sometimes had siphons mounted on each side of the ship, as well as small siphons that could be used for boarding actions or for repelling boarders. Although the Byzantines zealously guarded the secret makeup of Greek fire, the Arabs eventually produced a similar flammable liquid in the ninth century C.E.

Dromons also carried other offensive weapons, for both long-distance attacks and close ship-to-ship action. They had large crossbows, known as *toxoballistrai*, mounted on deck. Small catapults capable of launching stones or pots containing vipers, scorpions, quicklime, or Greek fire were also used. Deck crews were armed with bows and crossbows. For close work, cranes were used to drop heavy stones onto and hopefully through the decks of opposing ships.

Byzantine naval supremacy remained unchallenged until the seventh century reign of the Byzan-

North Wind Picture Archives via AP Images

The sea battle at Actium, 31 B.C.E.

tine emperor Heraclius (c. 575-641). In 626 C.E., a Persian army and an Avar fleet threatened Constantinople, but the Byzantines destroyed the Avar ships, forcing the besiegers to withdraw. Soon afterward, the Arabs, realizing the importance of naval power, developed a fleet based upon the Byzantine model and began to challenge the Byzantines for control of the Mediterranean. This fleet proved to be quite successful, defeating the Byzantines in 655 C.E. at Lycia (Dhat al-Sawari), off the Syrian coast. In 717 C.E. Constantinople was attacked by a large Arab flotilla, but the Byzantines were able to destroy the attacking fleet with Greek fire, lifting the siege and allowing Emperor Leo III (c. 680-741) to drive off the Arabs.

Although the Byzantines were successful in fending off Arab attacks on Constantinople, they were less successful in 1204 C.E. during the Fourth Crusade. In a carefully planned amphibious assault using both soldiers and warships, the Crusaders were able to capture the city that had withstood capture for nearly nine hundred years.

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R. Scott Moore

THE ANCIENT WORLD

Violence in the Precivilized World

Dates: To c. 4000 B.C.E.

Overview

Traditionally, historians distinguish between violence perpetrated by individuals against other individuals and group violence perpetrated against other individuals or groups. Organized, lethal group violence among social groups is "warfare," as in the modern "gang wars" concept. In historic times group violence became associated with the progression toward organized state warfare from more individualistic forms of violence in the precivilized world. In the twenty-first century, archaeological researchers have challenged the traditional border between precivilized group violence and civilized warfare. Evidence from the Stone Age, before 4000 B.C.E., shows the existence of episodic group violence that can be construed as warfare. The main issue is how researchers define and interpret evidence of violence and warfare in the precivilized world.

Significance

The lack of technological advancement in the precivilized world led to the view that warfare of the time was also relatively "undeveloped." In 1949, Harry Holbert Turney-High developed the influential concept of a "military horizon" for what he termed the "primitive warfare" of the precivilized world. This view led military historians to focus on state-level warfare after 4000 B.C.E., while anthropologists focused on modern tribal conflict. Present-day archaeologists have accumulated enough data on the period that scholars now believe that warfare episodes did occur in the precivilized world, sometimes with more deadly results than are seen in modern wars. This challenges the traditional evolutionary model of warfare, which views ancient peoples as engaging in individual violence and small blood feuds, with complex warfare emerging only after states developed larger populations and more sophisticated war technologies.

Scholarship

Turney-High's work *Primitive War*, first published in 1949, relied on anthropological studies of modern tribes such as the Zulus and Apaches, which were heavily affected by colonialism and technology. In the 1960's, anthropologists such as Margaret Mead (1901-1978) challenged the earlier model, noting the difficulties of applying data from the "ethnographic present" of modern cultures to a far different ancient world. Mead even claimed to have found Pacific island tribes that did not know of war. This fueled the academic nature-versus-nurture debate on the origins of war: Were early peoples inherently warlike, or is warlike behavior a learned trait?

Cultures such as the Maya and the Pueblo peoples of the American Southwest were put forth as peaceful examples, whereas the Spartans and Aztecs were cited as warlike. Some researchers claimed that war was common in the distant past, whereas others argued that war is a relatively recent phenomenon. The debate continues as archaeologists uncover increasing evidence of group violence in the precivilized world. When did war begin? Have human beings always been violent? How should violence and war be defined? The answers to such questions have much to do with the interpretive worldviews of the scholars and researchers who explore these topics.

EVIDENCE

Evidence of the ancient presence of violence and war in human life comes primarily from skeletal remains and human-made artifacts, geographical features, architecture, and iconography created before 4000 B.C.E. Some of the best evidence is provided by groups of skeletons with ellipsoid cranial fractures, embedded projectiles, and decapitation marks found along with associated artifacts such as maces, spears, sling balls, and arrowheads in the context of defensively built or located architecture. Such forms of evidence are rarely found all together at sites dating to before 4000 B.C.E., perhaps indicating how rare actual battle was at that time.

The various kinds of evidence tend to be found in differing combinations. Evidence exists of mass death by violence in Egypt by 7000 B.C.E.; of the building of walls, towers, and other defensive locations as well as the use of maces and slings in the Levant and Turkey by 6000 B.C.E.; and of the construction of elevated forts with moats, baffled gates, and palisades in China by 5000 B.C.E. All of the mentioned forms of evidence—including battle scenes on cylinder seals—can be found in Sumer by 4000 B.C.E., indicating that by that time warfare was clearly under way.

The existing evidence concerning human violence has spawned debate among researchers such as Lawrence H. Keeley, R. Brian Ferguson, and Steven A. LeBlanc concerning the best ways in which to define, identify, and interpret the relationship between group violence and war. When is group violence a battle? Does the definition of warfare need to include the existence of battles? Is evidence of the threat of "coercive force" expressed in architecture, weaponry, and the like enough to indicate the presence of war? What if the evidence is limited to a few times and places? Researchers point to the lack of skeletal marks left on many remains in modern warfare when individuals perish from soft-tissue trauma. They note also that modern military systems have armies, soldiers, and fortifications that will never be involved in any battle deaths, yet no one doubts these are associated with war. Is specialization by the individual, the weapon, and the architecture the key? This is a debate that will not die down anytime soon.

VIOLENCE VS. WARFARE

The growing body of archaeological evidence has led to renewed interest in the relationship between ancient violence and warfare, and in the question of the nature of warfare in the precivilized world. It has been suggested that several "origins" for war are associated with specialization in violence, one taking the form of sporadic outbreaks of war among specialized Stone Age hunter-gatherers as settlements emerged and another being the outbreaks related to the first formations of states after 4000 B.C.E. This possibility fits well with the episodic nature of the available archaeological evidence. As the great philosopher of war Carl von Clausewitz (1780-1831) noted, war is the province of violence; it is the nature of the relationship between violence and war in the Stone Age with which archaeologists now grapple.

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Christopher Howell

THE ANCIENT WORLD

EGYPT AND THE MIDDLE EAST

City-States and Empires Through Old Babylon

Dates: c. 3500-1595 B.C.E.

Military Achievement

The evolution of warfare in ancient Mesopotamia led to the creation of large and powerful empires in the Near East, the weapons and formations of which influenced classical civilization. Historians believe that the beginnings of organized warfare coincided with the dawn of written history in both Mesopotamia and Egypt, probably independently of each other. Around 4000 B.C.E. the Sumerians, a people of unknown ethnic origin, settled in southern Mesopotamia, building their cities and fortifications from mud bricks. They failed to create a stable, unified kingdom and lived in a cluster of independent city-states, such as Ur, Kish, Lagash, Erech, Suruppack, Larsa, and Umma, and constantly warred with each other for supremacy over the region.

The first steps toward unity were taken in southern Mesopotamia when King Lugalzaggesi (r. c. 2375-2350 B.C.E.) of Uruk created a temporary Sumerian Empire by subduing his rivals and ultimately establishing nominal control over all of Mesopotamia, as well as parts of Syria and Asia Minor. He was defeated by the Akkadian king, Sargon the Great (c. 2334-2279 B.C.E.), who led a Semitic band of warriors in conquest of Sumer, unifying upper and lower Mesopotamia and creating the first real empire in history, which lasted nearly three hundred years. In thirty-four major battles, Sargon used new technology to establish a domain that stretched eventually from the Mediterranean Sea to the Persian Gulf. Akkadian civilization eventually succumbed to an invasion of barbarous mountain dwellers from the east called the Gutians, who were victorious not because of their superior technology but because of their intensity in combat. Some time after 2100 B.C.E., the Sumerians reasserted their supremacy over southern Mesopotamia, which precipitated a renaissance of Sumerian culture and control in the area that lasted for approximately two hundred years.

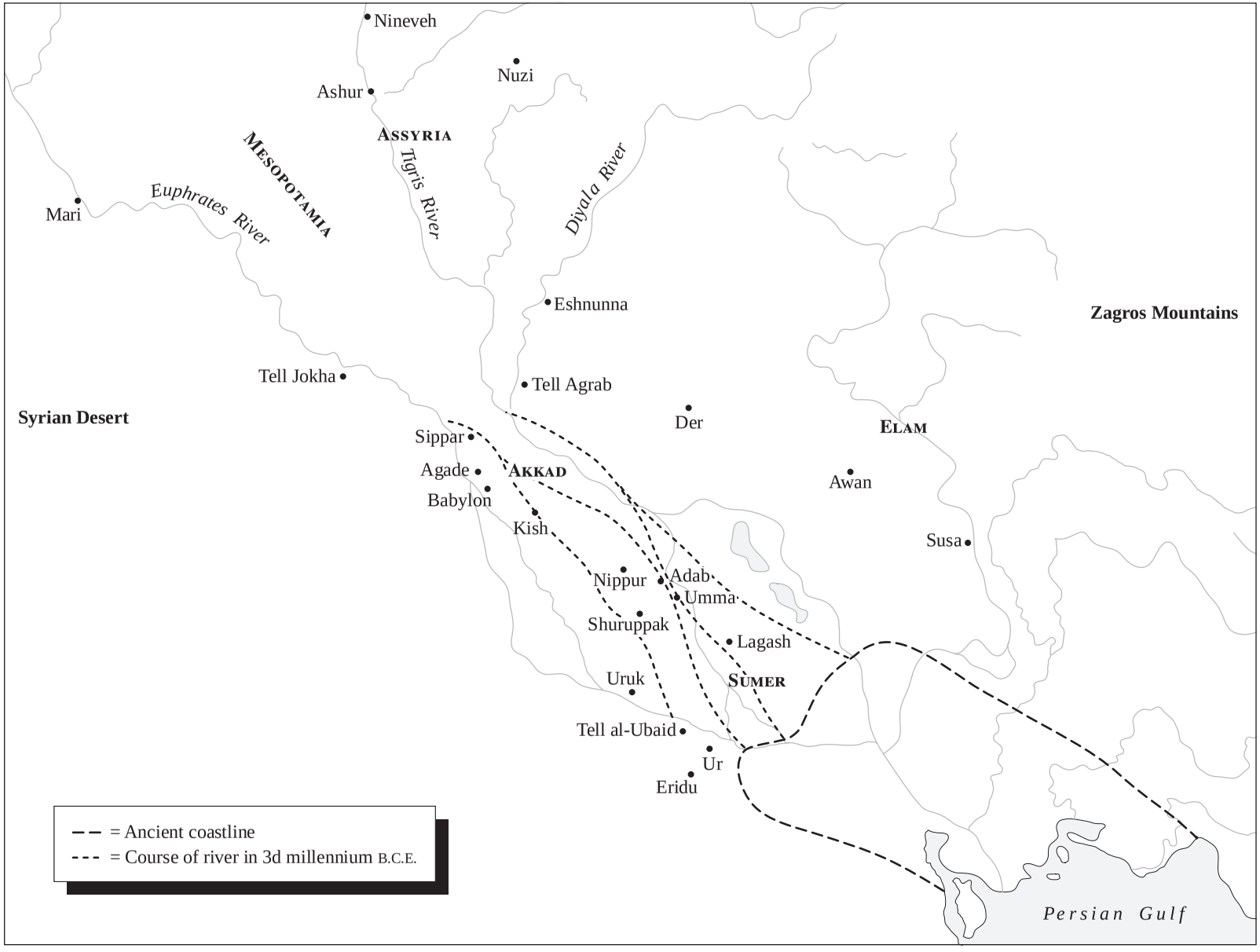
After the beginning of the second millennium B.C.E. a new Semitic race of people, the Babylonians, perhaps from the area of modern Syria, rose to prominence in Mesopotamia. With its capital established at the city-state of Babylon, the whole region once again became unified under the rule of the powerful Babylonian leader Hammurabi (c. 1810-1750 B.C.E.), the famous lawgiver, warrior, and strategist.

Hammurabi's death was followed by a number of revolts that led to the rapid disintegration of his king-

Turning Points

c. 3200 B.C.E.	The Bronze Age is inaugurated in Mesopotamia as new metal technology allows more lethal weapons and more effective armor.
c. 2500 B.C.E.	The Sumerian phalanx is first employed.
c. 2300 B.C.E.	After the composite bow is introduced by Sargon the Great, the use of the Sumerian phalanx declines.
c. 2100 B.C.E.	The Sumerians reassert their supremacy over southern Mesopotamia, precipitating a renaissance of Sumerian culture and control that lasts for approximately 200 years.
c. 1810 B.C.E.	Neo-Babylonian leader Hammurabi unifies Mesopotamian region under his rule and establishes capital at the city-state of Babylon.
1595 B.C.E.	Mesopotamian Empire falls to the Kassites.

SUMER AND AKKAD, C. 4000-2000 B.C.E.



dom. In the late seventeenth century B.C.E. the Hittite Empire, centered in Asia Minor, began expanding with the aid of early iron technology. In 1595 B.C.E. Mesopotamia fell to the Kassites and entered into a long period of lethargy.

Library of Congress

A relief of Hammurabi, the powerful Babylonian leader who united the Babylonian kingdom and codified its laws.

WEAPONS, UNIFORMS, AND ARMOR

Ancient weapons in Mesopotamia can be divided into two categories: shock weapons, for striking the enemy in hand-to-hand combat, and missile weapons, for shooting or throwing at the enemy. The earliest weapons were crafted from stone and included the mace and the stone ax. The inauguration in Mesopotamia of the Bronze Age (c. 3200 B.C.E.), so called for the introduction of new metal technology, was roughly contemporaneous with the beginnings of city-state civilization and ushered in the use of metal weapons, making warfare much more lethal than it had been previously. The use of metal transformed shock weapons. Brittle stones were unsuited to producing lasting sharp edges used for striking opposing combatants. The introduction of metal helmets, shields, and body armor with bronze scales eliminated the effectiveness of the mace in favor of the battle-ax and metal-tipped spear. A helmet excavated from one of the richly adorned graves at the Royal Cemetery of Ur and dating from 2600 to 2400 B.C.E. was made of electrum, a gold and silver alloy, and hammered into shape from the inside.

The chariot appeared much earlier in Mesopotamia than elsewhere. Although it was in wide use as early as 3000 B.C.E., it was not the highly mobile, two-man, two-wheeled vehicle that appeared only after centuries of development. The war chariot of Sumer was a large, heavy, rather clumsy four-wheeled vehicle that carried a driver, a warrior, and two shield-bearers commissioned to protect the warrior. The chariot warrior was armed with a spear, sometimes a battle-ax, but not a bow, which was used earlier and more regularly in other Near Eastern cultures, particularly in Egypt, and arrived in Sumer only much later. Akkadian warriors under Sargon introduced Mesopotamia to the use of the composite bow, which provided this force with the necessary margin of superiority over the Sumerians. The bow fell into disuse until it began to be employed again during the reunification of Mesopotamia under Hammurabi.

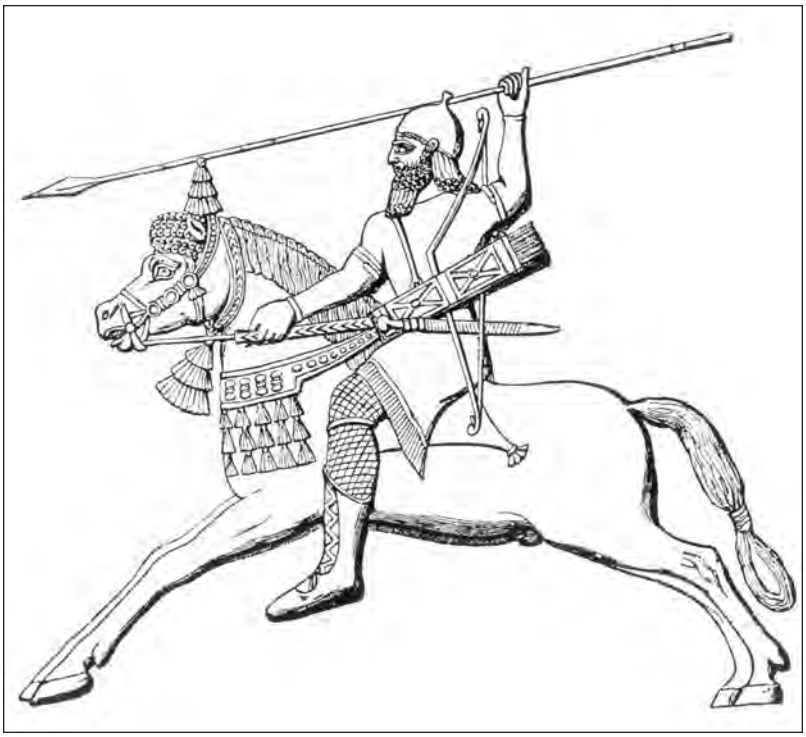
MILITARY ORGANIZATION

The Sumerian Stela of the Vultures, an artifact of singular importance dating from approximately 2500 B.C.E., supplies information about the organization and formation of combatants into fighting units in

Mesopotamia. This limestone victory monument depicts King Eannatum of Lagash leading his troops into battle. The warrior-hero stands at the head of his advancing army, which is composed of a cadre of infantrymen packed shoulder to shoulder behind a barrier of interlocking, handheld rectangular shields, wearing matching helmets and presenting a hedgehog formation of protruding spears. In other words, the infantry forms a genuine, full-fledged phalanx. This depiction is significant because it constitutes evidence that the phalanx was used two thousand years before it was implemented by the Greeks, and it emphasizes the importance of Sumerian military developments, which are often overlooked in the history of weapons and warfare. The Sumerian phalanx seems to have been a full-blown innovation rather than a product of an evolutionary technological process.

Additionally, the Stela of the Vultures depicts all of the phalangite infantrymen as outfitted and protected in the same fashion but distinct in dress from the single warrior-leader placed in front to direct the shock troops. Although the egalitarian outfitting of troops is certainly predicated on the practical demands of the type of close-arm combat tactics employed in Mesopotamia, it also suggests to scholars that regalia determined one's standing and social status as well as the expectations and presumed responsibilities of office.

The campaign of Sargon the Great, empowered by the new technology used by his Akkadian bowmen against the Sumerian leader Lugalzaggesi of Uruk, is regarded as the factor responsible for the disappearance of the Sumerian phalanx. Sargon's empire consisted of a small warrior class living off the work of a few artisans and craftsmen and a large peasantry.



North Wind Picture Archives via AP Images

A mounted Babylonian warrior carrying a sword, spear, and bow and arrow.

DOCTRINE, STRATEGY, AND TACTICS

Very little is known about the roles played by individual kings or commanders. The first organized battles in Mesopotamia occurred before 3500 B.C.E., when smaller groups armed only with crude stone weapons and without protective armor clashed with one another for control of food sources and land. Although cultures coalesced and armies increased in size, any cogent doctrine of warfare or sophisticated strategies seem to have been lacking. The key to effective combat was to find and kill the enemy's leader. If the king and his retainers were destroyed, so would be their army's chances for victory. With the development of city-states and walled towns in early Mesopotamia, siege warfare became increasingly important. The subjugation of all city-states and towns became the common goal of every competing army

seeking to control the entire area. Warfare in early Mesopotamia was more frequent and less decisive strategically than in other parts of the ancient world precisely because of the constant intramural wars of the competing city-states. With the establishment of the first empires in Mesopotamia, warfare became directed outward, toward the conquest of neighboring peoples and adjacent lands. For the most part Sumerian, Akkadian, and Babylonian styles of war remained confrontational, geared toward the frontal assault. This type of warfare, along with the types of weapons associated with such fighting, tended to emphasize the need for, and the prestige attached to, the attributes of bravery and physical prowess.

Because chariots in early Mesopotamia were not very mobile, they probably were not used in the same tactical way as were later two-man chariots. Later chariots could be deployed in quick shock attacks against an enemy's flank and in fighting against other chariots. However, the early four-man chariots had to be drawn by asses because they were so cumbersome and, consequently, had to be maneuvered very close to enemy fortifications and forces in order to deliver any kind of effective firepower. Sources seem to agree that the early Mesopotamian chariots had little effective use as tools of destruction. They did, however, serve as instruments of intimidation, or for bringing a leader to a battlefield.

Ancient Sources

The Sumerians kept records on clay tablets inscribed in cuneiform. One of the most famous stories from this culture, the Gilgamesh epic (c. 2000 B.C.E.; English translation, 1917), describes the life of Gilgamesh of Uruk, an actual person around whom legends formed and who may be regarded as the first military hero in Near Eastern literature, serving as a model for warriors who followed. Gilgamesh was armed with a battle-ax bearing an actual name, "Might of Heroism," the first in a long line of titled weapons in the ancient world. The Gilgamesh epic also indicates that before the Mesopotamian warrior-leader decided to go into battle, he put the question before an assembly of the warrior class.

For the most part, however, information on warfare during the Sumerian period has come from images recovered by archaeologists. The Standard of Ur, found in the Royal Cemetery at Ur and now in the British Museum, has clear images of a variety of soldiers, demonstrating their armor and weaponry, as well as of five chariots. Indeed it is from this one find that much knowledge of warfare involving Ur comes. Some old weapons have also been recovered, and there are also surviving stelae.

Various artifacts, including the Stela of the Vultures, uncovered by the work of archaeologists, present visual images of ancient weapons and methods of war. Although physical evidence from the Akkadian period is slim, two cuneiform fragments depict the use of the composite bow, which scholars have hypothesized was made by carefully laminating bone, sinew, and keratin to a wooden core to create a weapon with tremendously magnified power.

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Andrew C. Skinner

The Hittites

Dates: c. 1620-1190 B.C.E.

Military Achievement

The Hittites ruled a powerful empire in Asia Minor and northern Syria during the seventeenth to twelfth centuries B.C.E. One of their primary military achievements was in establishing a sphere of political influence in the Near East. Another was their creation of a professional army, in conjunction with refinements in siege warfare and the training of horses for use with the lightweight, single-axle chariot.

Weakened by royal family infighting, the Hittite Empire militarily secured by Mursilis I (r. c. 1620-c. 1590 B.C.E.) was in disarray two hundred years later when Suppiluliumas I (r. c. 1380-1346 B.C.E.) ascended to the throne. Hittite domination of central Anatolia, Syria, and territory stretching as far as the Amorite capital of Babylon was no longer assured.

Toward the mid-fourteenth century B.C.E., the Hittite capital of Hattusas (modern Bogazk) was threatened, apparently with the assistance of the Hurrians of the Mitanni kingdom and of the Syrians at Aleppo. Around 1370 B.C.E., the Hittites under the leadership of Suppiluliumas I set out to reestablish their hold on Syria. The initial campaign against the Mitanni kingdom, a 300-mile march and attack on the Syrian kingdom's northwest corner, was unsuccessful. A second campaign (c. 1367 B.C.E.) took the Mitanni Nuhasse neighbor. A third (c. 1365 B.C.E.) resulted in Hittite control of Isuwa in northeast Anatolia. The fourth campaign advanced to threaten the southern Mitanni capital of Wassukkani. In 1366 B.C.E., Suppiluliumas captured Kadesh (Qadesh) in western Syria. Finally, in c. 1350 B.C.E., he succeeded in taking Carchemish, an important and strategic trade route on the west bank of the Euphrates River.

Suppiluliumas's military success reunited the Hittite Empire but introduced a third military power into the balance of the two dominant military forces in the Near East, Mesopotamia, and Egypt. Mursilis II (r. c. 1345-c. 1320 B.C.E.) the heir to Suppiluliumas's expansionist policy, passed the Hittite Empire to his son, Muwatallis (r. c. 1320-c. 1294 B.C.E.). Over time, a growing internal unrest, stimulated partly by allied Mitanni and Assyrian forces, caused uprisings but received little response from the Hittite leader. Consequently, the Assyrians reconquered the region in a unified and formal manner. The Hittites, harassed by requests for defensive assistance from their allies, but irritated by the sporadic raids made by their nominal vassal states, set out to reestablish Suppiluliumas's imperial holdings. The Hittites, rather than fight with their allies, the Assyrians, elected to engage the Egyptians in battle at Kadesh in Syria.

After about 1190 B.C.E., the Hittites faded as a major political and military power in the Near East. As the Assyrian Empire continued to expand systematically, the Hittite Empire eventually collapsed.

Weapons, Uniforms, and Armor

The principal weapons used by the Hittites in battle were the bow and arrow, ax, and spear. The chariot was also used defensively. Suppiluliumas's strengths were his strategic tactics, his patience, and his ability to extract from defeat the seeds for future victory. His first defeat by the Mitanni illustrates his use of the chariot as a strategic weapon rather than a fighting wagon.

The Hittite spear, known from illustrations found at Egyptian ruins, consisted of a pointed metal blade attached to a wooden shaft with leather wrappings. Originally, the blade was made of copper, then bronze, and finally iron. The spear's structure consisted of a socket for the blunt blade end reinforced with leather strips attached to the wooden shaft. The spear shaft, for cutting and slashing, was fitted to maximize damage to the enemy in hand-to-hand combat. Although

Library of Congress

A depiction of a relief on a wall at Giaur-Kala in modern Turkmenistan, showing two Hittite soldiers.

the spear has its advantages as a thrown weapon, there are no illustrations of Hittites actually using a spear offensively in this way. Instead, the spear seems to have been used primarily for defensive purposes, such as to guard the driver and bowman in the three-man chariot crew.

The design of both the ax and the battle-ax forms the shape of a human arm attached to a shaft. The flanged hand-end of the ax is flared in long bronze fingerlike forms. In hand-to-hand combat, the sharp-edged wrist section could not be grasped without cutting through the enemy's hand. The ax's extended, clawlike frontal section made it possible to slice through the neck of the enemy. In addition, the thumblike portion of the ax, just before the shaft, functioned as a hook for gouging. The dagger differs in design, with a shorter, double-edged blade for use in hand-to-hand combat.

Body armor worn by the Hittites consisted of 4.5-inch bronze plates bound together with linen or leather to form a small breast jacket. The jacket was made originally to protect the chariot driver and crew. A relief found in Luxor, Egypt, detailing the Battle of Kadesh (1274 B.C.E.) shows the Hittite infantry wearing ankle-length skirts made of leather without any metal plating. Because infantrymen required mobility, the metal plating may have been eliminated and the protective metal plates replaced with leather.

Hittite infantrymen were armed with javelins intended to be thrown either while on the run or from a stationary position. The lance was the traditional Hittite weapon for the chariot crew. Their use in bat-

tle is not recorded visually in the Luxor relief. Although Ramses II made claim that the Hittites were unable to use either their bows or their javelins because his chariots charged through their lines, thereby preventing a frontal assault, it is questionable whether such a tactic was actually used. The statement suggests that the throwers may have been not in the chariots but rather on foot, in retreat, or unable to immobilize the Egyptian chariots. Such a thesis implies that the throwers either were separated from their chariot crew or were in disarray.

Although the physical evidence indicates that bows and arrows tipped in bronze were used as a major weapon in conjunction with the Hittite chariotry, there is little evidence that archers were used with chariots. Evidence for Hittite bowmen in action is scarce. Only Muwatallis, the king of the Hittites, is depicted in the Luxor reliefs in a chariot with an archer and bowcase. These reliefs show the Hittites with a defensive force and the Egyptian army with offensive weapons. Ironically, the intended purpose of this work was to show the heroic and invincible Egyptian Pharaoh in the face of Hittite aggression. Contradictory information is contained in the Abydos inscriptions, where the Egyptian king records "killing horses, capturing chariots, bows, swords, all weapons of warfare."

The simple but sturdy Hittite chariot provided the army with an effective battlefield vehicle. The chariot design enabled the Hittites to retain flexibility and mobility in battle and to carry a three-man crew, consisting of driver, archer, and spear bearer.

The typical offensive use of the chariot by the Hittites was to taunt and encircle the enemy at a distance. After the chariot's forward advance toward the enemy, the infantry might advance using lances to inflict damage. The Hittite strategy suggests an emphasis on a defensive use of the chariot against an offensive line. Once the enemy line was broken by the chariotry, the Hittite infantry could strike effectively.

MILITARY ORGANIZATION

Upon his ascension to the Hittite throne in about 1380, Suppiluliumas I inherited an empire frayed by Hittite vassal-states. To restore the Hittite kingdom, he reinforced and restored the decaying fortifications of the Hittite capital, Hattusas, constructing a massive wall to encircle the city's vulnerable perimeter. Suppiluliumas also reorganized the professional Hittite army, which recruited and enlisted infantrymen. The infantry provided the Hittites with a regular standing army that could be increased as needed by vassal treaty. The infantry did not contain the protectorate citizens or native Hittite populations. Supposedly, the use of vassal-state infantry eliminated the need for mercenaries, although Egyptian sources suggest otherwise, listing a great number of mercenaries in the Hittite ranks.

Instructional specifics about the training of Hittite soldiers are scarce. It is thought that special locales or training camps existed and that training consisted of drill practice. A Hittite king might bring several army divisions with him on a campaign, depending on the conflict. Hittite strategy originally focused on fast-attack troops but quickly shifted to siege warfare, in which support troops and supply lines for men and horses were more crucial than battlefield encounters to the success of the siege.

For strategic purposes, the basic military unit was a platoon of fifty infantrymen under the command of the king. These infantry units were reinforced with elite troops or chariot warriors. Decision making about battlefield tactics seems to have been left to the king alone. Acknowledged credit for battle success would lie respectively with the gods, the king, and then the king's generals. The different locations of unit types within the camp demonstrate a similar hierarchical arrangement.

Two principles defined the organization of the king's troops: chariotry and infantry. Within the reign of Suppiluliumas the leaders of each learned to work with the ten vassal-states. Although military professionals were incorporated into the Hittite army, they nonetheless remained identified with their individual vassal-states.

The Hittites had four types of troops: infantry, chariotry, outpost garrison, and elite guard. The sizes of the units are difficult to establish from existing descriptions, but evidence suggests that a division might have equaled about 5,000 men, a company

about 250, a platoon approximately 50, and a squad as many as 10. In the Hittite military hierarchy, the king was the leader. Two generals represented the two protectorates, and they were followed in command by the generals of the vassal-states. Combat officers consisted of a platoon leader, garrison-troop leader, squad leaders, and the infantry and chariot soldiers.

The location of the Hittite capital shows the depth of Hittite defensive fears. The capital, Hattusas, was founded around 2000 B.C.E. within a natural defensive perimeter: a downward slope to the north, a dangerous gorge to the east, and a deep valley to the west.

The defensive fortifications of the upper city were located on the highest ground and designed of smooth rock to prevent an assault force from scaling the walls. Along the outer wall, there is another, inner wall. Parapets with round crenellations and high towers between them provided windows that allowed soldiers to survey the surroundings, guarding from attack. The massive walls were punctuated with several towers flanked by gateways. On the south, the outer wall was reached by a steep, sloping staircase defended from the ramparts. Between the outer and inner fortification walls, a ramp was built to inhibit free access. The main gateway was flanked with stone carved towers, double locking doors, and windows to decrease potential assaults.

Access to the city could be gained through an underground postern, or back gate, about 230 feet long. It served a defensive military purpose by preventing massed groups from assaulting the city from beneath. The postern also had an offensive use, allowing Hittite soldiers to enter and leave the city undetected during a siege.

DOCTRINE, STRATEGY, AND TACTICS

Hittite strategy consisted of two parts: a military strategy for battle and a diplomatic strategy for treaties. The strategic weakness of the Hittite Empire is demonstrated by their treaties, of which the Hittites made two types: a treaty of parity with their two protectorate allies and a treaty of vassal-states. The Hittite treaty made the Hittites vulnerable to the petty raids and complaints of vassal-states. The other two major powers, Mesopotamia and Egypt, could leverage their treaties, but the Hittite treaty with vassal-states necessitated immediate response to calls for help by the vassal-states. If the Hittite Empire did not respond, it would be considered disinterested or too weak.

Egypt's sovereignty over the region during the second millennium B.C.E. reached from Canaan and the Levantine ports and the cities that bordered on the inland routes from Megiddo in modern Israel to the lands of the Hittite, Mitanni, and Babylonian kingdoms. Because control of the region was important to Egypt's continued trade with Near Eastern partners, Egypt kept pressure on the cities of Palestine simultaneously with the Hittites. Complaints contained in ancient letters indicate one catalyst for renewed hostilities: the emergence of the Amurru kingdom as a power. The nineteenth Hittite Dynasty witnessed renewed military activity throughout the region, threatening Hittite national unity and international expansionist policies. The result for both the Egyptians and the Hittites was the loyalty of Canaan and control of the Orontes Valley for trade with Syrian ports. The Egyptian campaigns of Sety I (c. 1306-1290) attempted to restore Egyptian hegemony in Canaan and the Amurru kingdom, which stood on the Hittite boundary. However, Sety succeeded only in Palestine. After the Egyptian king Ramses II (c. 1300-1213) ascended the throne, the provocation remained unresolved, and Ramses systematically began to retake control of Hittite territories along the Palestinian coastal plain to Byblos.

The Hittite strategy for the battle was designed to delude the Egyptians into thinking that the Hittite army was encamped beyond the city of Kadesh when they were hidden behind it, to the north. Ramses II, leading four divisions of his army—Amon, Re, Ptah, and Sutekh—made an unimaginable frontal attack for the city, leading the Amon division ahead of the other three divisions. The Hittite leader, Muwatallis, advanced around Kadesh on the west, while his chariots attacked the Re division from the south. Although the two armies were of virtually equal strength, Ramses was cut off from the rest of his army, with only one division.

In the Egyptian records, the Egyptians claim victory but it is possible that the Egyptians were prevented from recovering sufficient strength to oust the Hittites from Kadesh. The cunning strategy used by the Hittites demonstrates a keen understanding of the chariot's potential for subterfuge, coupled with speed and mobility.

ANCIENT SOURCES

Although many cuneiform tables survive from the Hittites, most of these are to do with the administration of their empire, and few have any bearing on their military strengths. Some archaeological work at Boghazköy has unearthed statuettes and bas-reliefs, but the vast majority of our information on the Hittite soldiers comes from bas-reliefs and carvings in Egypt, where they are shown battling the Egyptians. The best known of these is at Abu Simbel, and there are also others at Luxor, Abydos, and the Ramesseum, the funerary temple of Ramses II in western Thebes, which all record strategic details of the Battle of Kadesh.

The reliefs reveal the strategy of Ramses: to penetrate as far as possible into enemy territory and to set up his offensive position before the city. The reliefs at Luxor illustrate Ramses' arrival and camp, and the Hittite ruse and subsequent surprise attack through the camp shield barriers. Ramses' counterattack, depicted on the walls of the Ramesseum, illustrates his second strategy: to make a full-force, frontal attack into the enemy lines. The Hittite charioteers were more intent on plundering the Egyptian camp than on fighting, and the Hittite forces fell into disarray. They were then chased by the Egyptians into retreat.

None of the Egyptian reliefs, however, shows the capture of Kadesh or Hittite surrender. Ramses claimed victory less for Egypt than for himself. There is some validity to his claim. After his army had fled, it was Ramses' leadership that sustained the Egyptian forces on the battlefield. Traditionally, historians interpret the outcome of the battle as a draw.

These ancient sources are significant in that they provide the names of ally groups, terminology for weapons, the organization and identification of types of soldier units and chariot warriors, and insight into strategies. The Hittites' use of subterfuge reveals an awareness of the tactical offensive role of the chariot in warfare.

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Elizabeth L. Meyers

The Assyrians

Dates: c. 1950-612 B.C.E.

Political Considerations

Assyria was the ancient name of the area surrounding the upper Tigris River and its principal tributaries, the Greater Zab and the Lesser Zab, in northern Iraq. From an early period the people living there, the Assyrians, adopted many cultural features of the more civilized Sumerians of the lower Tigris and Euphrates River valleys, including cuneiform writing and a "hydraulic civilization," which required irrigation to take advantage of the available fertile alluvial plain. Although food could be produced locally, virtually all metals, luxury goods, and horses had to be imported or seized from surrounding mountains to the north and east, in modern Turkey and Iran, where the Assyrians frequently faced invasion from hostile tribes. The Assyrians needed to secure defensible borders beyond their homeland, and thus became intimately linked to the material prosperity of their empire.

Assyrian history can be divided into three periods. The empire first rose to power during the Old Empire period (1950-1500 B.C.E.). After the death of Shamshi-Adad I (r. c. 1813-1781 B.C.E.), Assyrian rule declined, leading to annexations by the Mitanni and to the revival of city-states, including Arrapha, Erbil, Ashur, and Ninevah. The Middle Empire period (c. 1500-900 B.C.E.) witnessed the rebirth of Assyrian domination. Ashur-uballit I (r. c. 1365-1330 B.C.E.) drove the Mitanni from Assyria and laid the foundations for further expansion. The Assyrians of the middle period reached their peak under Tiglath-pileser I (1115-1077 B.C.E.), who briefly expanded the empire as far as the Mediterranean Sea. After the death of Tiglath-pileser I, incursions of Aramaeans and dynastic struggles led to an alliance with Babylon and a retreat to the traditional Assyrian homeland.

Military Achievement

Assyria's greatest era of military expansion came during the late imperial period (c. 900-600 B.C.E.). Ashur-dan II (934-912 B.C.E.) reestablished control of his kingdom, and his four successors all pushed forward Assyrian borders and expanded control of valuable trade routes. Under Ashurnasirpal II (r. 883-859 B.C.E.), the Assyrians crossed the Euphrates River, forcing most of the Aramaean, Phoenician, and neo-Hittite kings as far as the Mediterranean Sea, the Taurus and Zagros Mountains, and the Armenian Highlands to pay tribute. Reflecting the importance of these new borders, Ashurnasirpal II moved the Assyrian capital to Calah, modern Nimrud, nearer to the front. Shalmaneser III (r. 858-824 B.C.E.) waged almost continual war during his reign. Although he maintained Assyrian dominance in northern Syria, he was defeated at Karkar in central Syria (853 B.C.E.) by a coalition of Syro-Palestinian kings that included Ahab (r. c. 874-c. 853 B.C.E.) of Israel. Shalmaneser III failed on five occasions to subdue Damascus and southern Syria but did manage to subdue Tyre, Sidon, and Israel.

After eighty years of domestic turmoil, Tiglath-pileser III (r. 745-727 B.C.E.) reestablished control over the Assyrian homeland and initiated the campaigns that destroyed the independence of the kings of Syria and Israel. Between 743 and 732 he drove the Urartians back into the Taurus Mountains and captured Damascus. In 729 he conquered Babylon. Israel was finally subdued during the first year of the reign of Sargon II (r. 721-705 B.C.E.), and Jerusalem, the capital of the southern Israelite kingdom of Judah, was unsuccessfully besieged by Sargon's son Sennacherib (r. 704-681 B.C.E.). The last great Assyrian king, Ashurbanipal (r. 668-627 B.C.E.), completed the conquest of Egypt that had been under-

Library of Congress

An Assyrian battle scene at the palace of Ashurnasirpal.

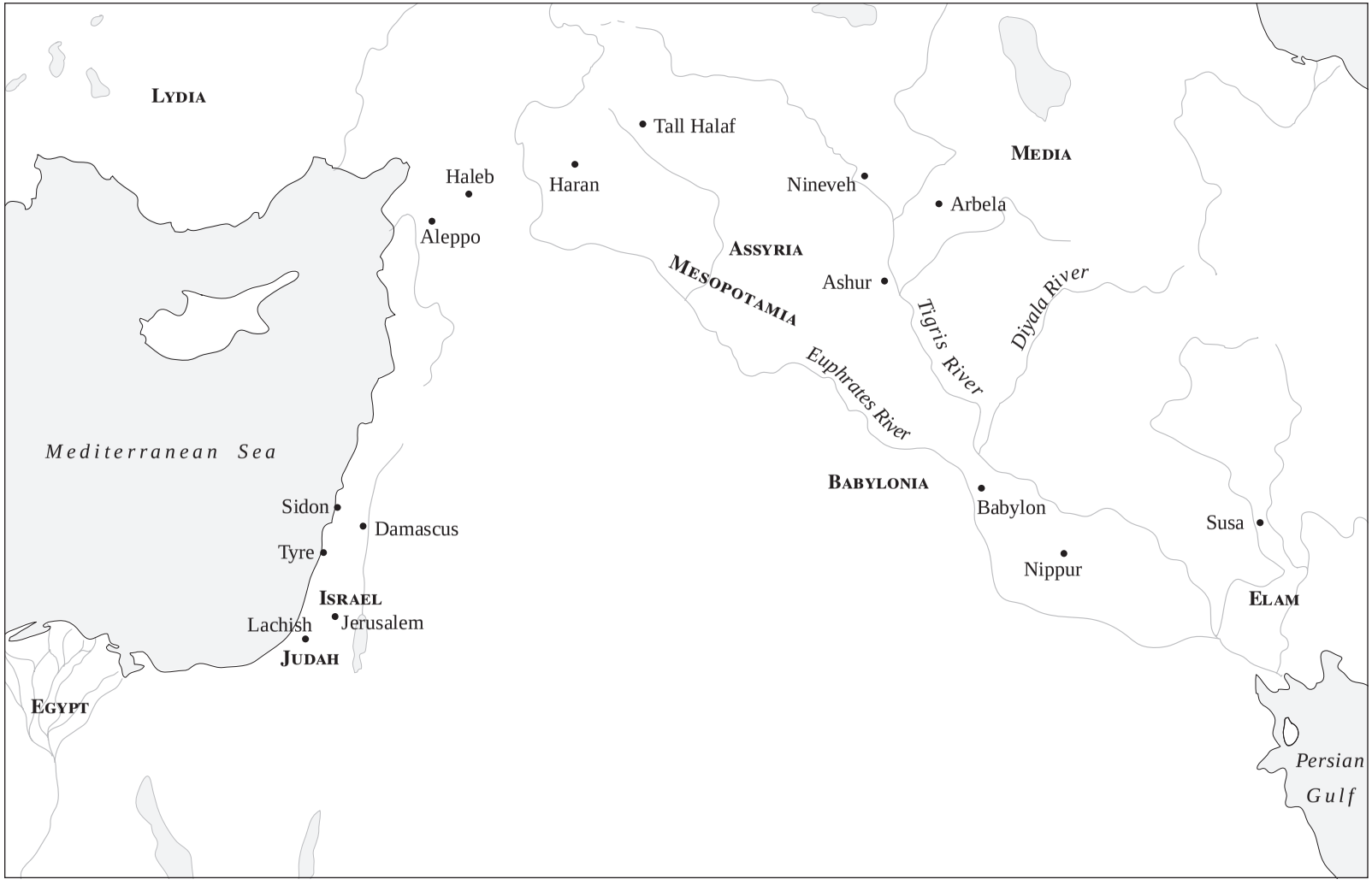
taken by his father. Continually harassed by the Elamites in the east (modern Iran), in 639 he led a massive campaign of extermination. The Assyrian Empire had never been greater, stretching from Thebes in southern Egypt to Tarsus in Asia Minor, to Babylonia in the south, and to Elam in the east. In less than thirty years, however, overextension, harsh treatment of subject peoples, and a disastrous struggle with the Medes led to the conquest of Nineveh (612 B.C.E.) by a combined army of Medes and Babylonians and to the final destruction of the Assyrian Empire. The Hebrew prophet Nahum (fl. seventh century B.C.E.) echoed the common sentiment of all Near Eastern peoples when he said, "All who hear the news of you clap their hands at your downfall, for who has not felt your unrelenting cruelty?"

WEAPONS, UNIFORMS, AND ARMOR

Assyria's offensive power initially rested upon development and use of the war chariot. Their vehicles evolved from the more mobile two-man chariot, used for reconnaissance, communication, and combat, to the heavy, four-horse, four-man chariot common during Ashurbanipal's reign. By the time the empire fell, cavalry units had taken over many of the duties of the chariots, which were then being used principally as firing platforms for archers and as shock vehicles in frontal attacks. Effective use of the chariot in combat was limited to flat or nearly flat terrain, making it less valuable as Assyria expanded into surrounding mountainous terrain.

The first record of Assyrian cavalry units is found in the ninth century B.C.E., when riders were deployed in pairs, with one man holding the reins of both mounts while the other fired a bow. As riders gained expertise, each horse and rider became an autonomous unit, with riders carrying long lances. By the seventh century B.C.E., the cavalry had largely displaced the chariot as the mobile force of the military, and horsemen were typically armed with both bows and lances. Riders covered their torsos with lamellar armor, consisting of bronze plates stitched to a leather underjacket, whereas fabric armor was used to protect their mounts.

Assyria and Babylonia, 600-500 B.C.E.



The bow and arrow and the lance were the most common weapons among infantry units, but slings, knives, and swords were also utilized. In the late imperial period, archers were deployed in pairs, with one man serving as a shieldbearer. Shields made from plaited reeds were often taller than a man and curved at the top to deflect incoming arrows. Both simple and compound bows were used, with ranges of between 250 and 650 meters. The bow used by particular units was often linked to the ethnicity of the unit. Records indicate, for instance, that there were distinctive Akkadian, Assyrian, and Cimmerian bows. Tiglath-pileser III introduced both the lance-spear, for close-order thrusting, and lamellar armor, known among elite infantry units as the *zuku sa sheppe*. Ordinary units and native levies had only a helmet and shield for their personal protection.

In an age during which the art of fortification was highly developed, the Assyrians were innovators in siegecraft and siege organization. They built movable wooden towers covered by dampened leather hides, which enabled expert archers to clear the parapets above while troops below worked to undermine the walls. They sometimes used a swinging "ram" to batter the walls and sometimes a ram with a wide, iron blade that would be inserted between stones and rocked in order to pry the stones apart.

Military Organization

Assyrian military success owed much to superior preparation, which allowed large armies to be quickly assembled. Shalmaneser III, for instance, reportedly invaded Syria in 845 B.C.E. with 120,000 troops. Marshaling cities were kept in readiness to receive corn, oil, battle equipment, and troops in preparation for a new campaign, thus enabling forces to be quickly organized and provisioned. This led to the creation of Ashurnasirpal's Greater Assyria, a large area of northern Mesopotamia that could be controlled by relatively short campaigns and raids. In keeping with the agricultural basis of society, campaigning was seasonal, with conscripts called to arms by July, shortly after harvest.

Despite successes, more extensive campaigns, attrition, and battle losses made campaigning under the old system difficult. Tiglath-pileser III initiated important military reforms that created the most efficient army of the ancient world until the rise of Rome, enabling emperors to vastly increase the size of the empire. Instead of calling up agricultural workers during the summer, he introduced a standing army and personal bodyguard that was augmented as necessary by contingents raised in the provinces and levies drawn from vassal states. The Assyrian army may have been the first in which ethnic units were integrated largely on a basis of equality, though they frequently performed functions for which they were already expertly prepared.

On campaign, the Assyrian king frequently led the army, but sometimes he delegated authority to senior field marshals, known as *turtans*. Below these wing commanders, rank designations indicated control of 1,000, 500, or 100 troops. Although much remains unknown about Assyrian military organization, it is clear that it enabled the Assyrians to create the first

Turning Points

1950-1500 B.C.E.	Assyrians first rise to power during the Old Empire period.
c. 1500-900 B.C.E.	During their Middle Empire period, the Assyrians drive the Mitanni from Assyria, laying foundations for further expansion.
c. 1000 B.C.E.	Iron begins to replace bronze in the making of weapons in Assyria.
900-600 B.C.E.	Assyria undergoes Late Empire period, its greatest era of military expansion.
745-727 B.C.E.	After years of domestic turmoil, Tiglath-Pileser III reestablishes control over Assyrian homeland and institutes military reforms.
721 B.C.E.	Sargon II conquers Israel.
612 B.C.E.	Assyrian city of Nineveh is conquered by Medes and Babylonians, marking the final destruction of the Assyrian Empire.

army capable of sustained, long-distance campaigning. An efficient system of supply depots, transport columns, and bridging trains enabled the Assyrian army to advance as rapidly as any army before the modern industrial age, fighting effectively at distances of up to 300 miles from their base of operations.

Assyria's unmatched striking capability was based upon its chariot force, which enabled it to wage lightning attacks across the plains of Mesopotamia and Syria, shocking enemy troops and paving the way for the lancers and archers of the infantry. From the ninth century onward, the cavalry became increasingly important, sometimes operating in units of 1,000 or more and eventually replacing the charioteers as the mobile arm of the military. This dependence upon cavalry forced the Assyrians to remain militarily aggressive in order to provide a continuous stream of remounts that could come only from capture, tribute payments, or taxation.

DOCTRINE, STRATEGY, AND TACTICS

Given the lack of geographical barriers, Assyria's grand strategy was to wage offensive wars that would push Assyrian boundaries far beyond the cities of the Tigris River Valley. As a part of this plan, terror was used as a deliberate tactic. The ultimate goal was to secure *adu*, or "pacts of loyalty," which required payment of tribute. If enemies refused to submit, it was not uncommon for all men, women, and children in a resisting city to be killed. Assyrians commonly laid waste to enemy lands, destroying granaries and irrigation systems and cutting down orchards. Surrounding territories would then be annexed, with native populations deported to distant cities.

Although all the Assyrian commanders were undoubtedly ferocious, some were recorded as being far more so than others. Tiglath-pileser III, in 744 B.C.E., for instance, was involved in the deporting of 65,000 people from Iran. Two years later, he resettled 30,000 Syrians in the Zagros Mountains of Persia. The use of deportation, torture, and other forms of terror was designed both to convince enemies to surrender and to deter future rebellious activity among conquered peoples. Tributary (vassal) states were allowed to maintain considerable autonomy, especially in the area of religion, whereas annexed territories, with imported foreign populations, were forced to worship Ashur and treated in every way as Assyrians.

As the power of the state grew, Assyrian strategy involved building a series of fortresses in annexed territories, and these would ensure control of trade routes. Control of roads enhanced trade and brought valuable commodities to a land that was not rich in natural resources, whereas fortresses were used as bases from which tribute raids could be launched into surrounding areas.

In terms of tactics, Assyria deployed infantry, cavalry, and charioteers in combined operations. Skirmishers, archers, and slingshot specialists harassed and demoralized opponents in the opening rounds of conflict. Infantry, armed with their lances, swords, and daggers, followed with a frontal assault against enemy lines. Cavalry and chariots would ideally provide the decisive thrust from the flanks or from the center of the Assyrian army toward a weak point in the enemy line. After the horses and chariots charged, a rout of the enemy could often be expected. However, if the forces were evenly matched, the cavalry and chariot charges might well be indecisive and yield a chaotic melee rather than a decisive victory.

ANCIENT SOURCES

There are extensive written records on campaigns of the late imperial period. The most important Assyrian sources include the annals of the Assyrian kings, which provide campaigning records; and many inscribed carvings and palace reliefs uncovered principally in Nineveh, Lachish, and other cities of the Assyrian homeland. Outside Assyria, victorious kings erected stelae, or carved stone pillars, on which they recorded their victories and reminded subjugated

peoples of their tributary status. Hayim Tadmor has edited *The Inscriptions of Tiglath-pileser III* (2007), which contains much of military interest.

One of the most accessible sources of ancient information regarding the Assyrians is from the Old Testament of the Bible, principally in the books of 2 Kings, 2 Chronicles, Isaiah, and Hosea. There are also scattered references to Assyrian warfare in Sumerian and Greek sources, including those of Herodotus (c. 484-c. 424 B.C.E.) and Flavius Josephus (c. 37-c. 100 C.E.).

However, the most important sources on the Assyrian armies are not written, but bas-reliefs from Nineveh, many of which are held at the British Museum, London. These depict warriors, chariots, and even entire battle scenes such as that showing the siege of the city of Lachish by Sennacherib in 701 B.C.E.

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Mark Polelle and John Powell

The Chaldeans

Dates: 626-539 B.C.E.

Military Achievement

The Chaldeans, or Neo-Babylonians, are credited with destroying the Assyrian Empire and establishing a new one in the Near East that was responsible for sacking Jerusalem, razing the Jewish temple located there, and destroying and deporting the kingdom of Judah in 586 B.C.E. The Chaldean culture was known not for military innovation but rather for honing previously used policies, weapons, and tactics in campaigns and battles that were fought over most of the ancient Near East.

During the period of Assyrian domination in the Near East (1300-700 B.C.E.), a new group of Semitic desert dwellers infiltrated southern Mesopotamia and established a culture that came to be known as Chaldean, named after the dominant tribe, the Kaldu. Discontent within the Assyrian Empire grew steadily during the reign of Ashurbanipal (r. 668-627 B.C.E.), the last great king of ancient Assyria. After his death, an imperial governor named Nabopolassar Nebuchadnezzar (r. 626-605 B.C.E.), a member of the Kaldu tribe, became leader of the insurrection. In 626 B.C.E., after a year of guerrilla war, Nabopolassar Nebuchadnezzar ascended the throne of the city-state of Babylon, inaugurated the Eleventh Babylonian dynasty, and established the Chaldean or Neo-Babylonian kingdom, to distinguish it from the Old Babylonian Empire of Hammurabi's (c. 1810-1750 B.C.E.) day.

For twelve years, from 626 to 614 B.C.E., war between the Chaldean, or Neo-Babylonian, kingdom and the remnants of the Assyrian Empire consisted of a series of battles over control of a network of fortified cities and towns in southern Mesopotamia, in modern-day Iraq. The Assyrians made an alliance with the Egyptians, who had become alarmed at the successes of the Chaldeans and of the Medes in what is now Iran. In 615 B.C.E. the Medes invaded Assyria and one year later captured the important city of Ashur. Significant emphasis was given by the Chaldeans to what might be termed coalition warfare in its early stages of development, and an alliance between the Chaldeans and the Medes was forged when Nabopolassar Nebuchadnezzar and the Median ruler Cyaxares (r. 625-585 B.C.E.) met under the walls of Ashur after the Median victory.

In 612 B.C.E. Nabopolassar Nebuchadnezzar led a final assault against Assyria's main city, Nineveh. Although it was strongly fortified, the city fell after a two-month siege, and, for all intents and purposes, the empire fell with it. In 610 B.C.E. the Medes and the Neo-Babylonians marched against Harran to the north and took it. The last of the Assyrian pretenders to the throne disappeared. The Medes did not lay claim to any part of the empire they helped to overthrow. Apparently content with their share of the booty, they withdrew to the east and turned their attention toward Armenia and Asia Minor. The Neo-Babylonians built their empire on the ruins of the Assyrian Empire, though they did not repair much of the damage they had inflicted.

After his final victory over the Assyrians, the aging Nabopolassar Nebuchadnezzar relied increasingly on his son, Nebuchadnezzar II (c. 630-562 B.C.E.) for the conduct of military operations. In 607 B.C.E. the crown prince attacked the Egyptian stronghold of Carchemish on the northern Euphrates River, routed the Egyptian army under Pharaoh Necho II (r. 610-595 B.C.E.), and gained military and economic control over areas to the west of Mesopotamia. However, just as all of Syria-Palestine now lay open to the Chaldeans, Nabopolassar Nebuchadnezzar died and Nebuchadnezzar II had to return to Babylon. He was crowned king in 605 B.C.E. For the next seven years he found himself quelling rebellion after rebellion in both Mesopotamia and Syria-Palestine. During the winter of 598 B.C.E. the king of Judah refused to pay

F. R. Niglutsch

Chaldean king Nebuchadnezzar II directs operations against rebellious Jews in 586 B.C.E., capturing and looting the capital of Jerusalem, destroying the Jewish temple, and rounding up and deporting thousands of Jews to Babylon.

tribute, forcing Nebuchadnezzar II to march on the kingdom's capital, Jerusalem, subjugating the city and installing a new king, Zedekiah.

Eleven years later, the kingdom of Judah was again at the center of rebellion against the Neo-Babylonian Empire. Nebuchadnezzar II personally directed operations against the rebellious Jews. In 586 B.C.E., after a siege of eighteen months, Jerusalem was captured, the city looted, the Jewish temple destroyed, and thousands of Jews rounded up and deported to Babylon. Thus, 135 years after thousands of citizens of the Northern Kingdom of Israel were deported by the Assyrians, thousands more Jews were once again carried away out of their lands in one of history's monumental turning points, the Babylonian Exile. One of the last actions of Nebuchadnezzar II in Syria was the siege of the coastal town of Tyre, which lasted thirteen years. A fragmentary text now housed in the British Museum alludes to a Neo-Babylonian campaign against Pharaoh Ahmose II (570-526 B.C.E.) in 568 B.C.E., but it cannot be determined if the Neo-Babylonians ever actually set foot in the Nile Valley.

The last years of Nebuchadnezzar II's reign are obscure and seem to have ended amid internal chaos. His son, Evil-Merodach (died 560 B.C.E.), of Old Testament fame, ruled for only two years (561-560 B.C.E.). After another four years of political instability, the Babylonians installed Nabonidus (r. 556-539 B.C.E.) on the throne. A government official of Aramaean origin, Nabonidus was the last king of an independent Babylon. In 539 B.C.E. the founder of the Achaemenid Dynasty and first king of the Persian

Empire, Cyrus the Great (c. 601 to 590-c. 530 B.C.E.), conquered the Neo-Babylonian Empire.

WEAPONS, UNIFORMS, AND ARMOR

The Chaldeans do not appear to have been innovators in weapons development; they used the weapons of their immediate predecessors in Mesopotamia, including spears, daggers, and battle-axes. They also employed the composite bow first developed by Akkadian king Sargon the Great (c. 2334-2279 B.C.E.) and reintroduced by Hammurabi of the Old Babylonian Empire.

Babylonian infantry units are described fighting with metal helmets and carrying lances and wooden clubs. Friezes and reliefs show that the mace, though one of the oldest weapons employed in the Near East, was still being used in the seventh century B.C.E. Weapons used by the Neo-Babylonians were the product of the Iron Age technological revolution. By 900 B.C.E. smiths throughout the Near East had learned how to combine carbon with red-hot iron to produce carburized, or steel-like, iron weapons. Biblical as well as Babylonian texts imply the unmatched virtues of such weapons, referring to both their hardness and their sharpness. Other important pieces of equipment used in Neo-Babylonian warfare included scaling ladders, used in siege operations against walled cities, and war chariots.

MILITARY ORGANIZATION

Neo-Babylonian armies pursued their grand strategy by organizing together troops with different kinds of weapons and different tactical objectives: infantry units armed with spears and clubs, cavalry warriors on horseback, charioteers, and siege units that also included scaling parties composed of archers. Their strategy was to overwhelm the enemy. Although the Greek historian Herodotus (c. 484-424 B.C.E.) later indicated that the greatest of the Median kings, Cyaxares, was the first ruler who divided his troops into companies and distinct bodies of spearmen, archers, and others, all evidence indicates that Nabopolassar Nebuchadnezzar would have known of this well-coordinated, systematic arrangement of troops long before he formed his alliance with the Median ruler.

The Chaldeans undoubtedly followed the example of their predecessors, the Assyrians, in collecting horses for their cavalry troops from the many villages specifically cultivated for that purpose in Mesopotamia. Characteristic chariots of the period were large-wheeled, maneuverable, high-platformed vehicles accommodating three or four persons: a driver, an archer, and one or two shield bearers to protect them. Late seventh century B.C.E. reliefs show chariots being preceded by two archers mounted on horseback, with slingers ahead of them.

DOCTRINE, STRATEGY, AND TACTICS

Because the major cities and towns in the Near East were walled, strongly fortified complexes by the time the Neo-Babylonians appeared on the scene, siege warfare was the dominant tactical principle employed in the seventh and sixth centuries B.C.E. The first-attacked cities in a region were usually those that supported the most important city, the capital, because of their strategic military value, their economic importance,

TURNING POINTS

1300-700 B.C.E.	Semitic desert dwellers infiltrate southern Mesopotamia to establish Chaldean culture during period of Assyrian domination in Near East.
626 B.C.E.	Nabopolassar Nebuchadnezzar leads revolt against Assyrian rule and establishes Chaldean, or Neo-Babylonian, kingdom.
587-586 B.C.E.	Nebuchadnezzar II uses siege warfare to conquer Jerusalem.
539 B.C.E.	Chaldean Empire is conquered by Persian king Cyrus the Great.

and their symbolic value. These cities were usually of religious importance, because they were the home of either a region's patron deity or priestly class, or both. The capital city of a kingdom or group of people was often reserved for the final siege, because it was the most strongly fortified of the cities, and also because it could be greatly weakened in both supply and morale by the loss of its network of supporting towns.

A specific purpose of the siege was the attempt to starve the holdouts into submission, as in the Siege of Jerusalem (586 B.C.E.). Information about an opponent's troop strength, tactical weaknesses, fortifications, and other areas of possible exploitation was obtained either by spies who infiltrated the enemy camp or by internal informers. Once a city was captured, further resistance was often preempted by razing its walls. The rebuilding of a city's walls was usually regarded as a symbol of renewed revolt. The Neo-Babylonians also applied the policy of torching conquered cities. Modern archaeological excavations in Jerusalem attest to a great conflagration that swept over the whole city but that was especially prominent in the residential district, data which harmonizes well with the report presented in the Bible's Book of 2 Kings (25:9).

Campaign plans of the Neo-Babylonian military machine were often based on tradition and long-established patterns of warfare. The Neo-Babylonian conquest of Syria-Palestine followed much the same strategy and order employed by the Assyrians more than a century earlier. Like the Assyrians before them, the Neo-Babylonians also used the policy of deportation of vanquished foes with great effectiveness, especially as a tool of psychological warfare to break the will and ability of opponents to recombine against their oppressors.

Alliance warfare was an important strategy to the Chaldeans, or Neo-Babylonians, in their conquest of Assyria and the establishment of their own empire. Royal marriages during war sometimes sealed coalition agreements, as when Nabopolassar Nebuchadnezzar's son, Nebuchadnezzar II, was wed to Amytis, the daughter of the Median ruler, Cyaxares. From that point on, the Chaldeans and the Medes fought side by side and the fate of the Assyrians was sealed.

Ancient Sources

Perhaps the most valuable resource regarding Neo-Babylonian warfare is a series of ancient texts collectively translated and known in English as *The Babylonian Chronicle* (1887). Begun in 626 B.C.E., the same year Nabopolassar Nebuchadnezzar ascended the throne of Babylon, this record describes the many wars and campaigns of the Chaldeans and allows military historians to follow, almost day by day, the history of the Neo-Babylonian Empire. It includes invaluable accounts of the fall of Nineveh and other Assyrian cities.

The Hebrew Bible, or Old Testament, also provides important commentary on the strategy and tactics used by the Neo-Babylonians and reports on their destruction of various cities both in Syria-Palestine and Mesopotamia. For example, Nahum (3:1-7) preserves not only the sense of vengeance unleashed during the destruction of Nineveh but also the tools of war in use:

> Cursed be the city of blood, full of lies, full of violence. . . . The sound of the whip is heard, the gallop of horses, the rolling of chariots. An infinity of dead, the dead are everywhere! My anger is on thee, Nineveh, saith Jehovah. . . . I will show thy nakedness to the nations and thy shame to the kingdoms. And then it will be said: Nineveh is destroyed! Who will mourn her?

Other important sources on Chaldean or Neo-Babylonian warfare include the writings of classical authors as well as Flavius Josephus's (c. 37-c. 100 C.E.) *Antiquitates Judaicae* (93 C.E.; *The Antiquities of the Jews*, 1773).

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Andrew C. Skinner

The Hebrews

Dates: c. 1400 B.C.E.-73 C.E.

Political Considerations

The history of the Hebrew people contains a large number of military campaigns and battles. The biblical stories of the walls of Jericho falling down and of David standing against Goliath with a slingshot are familiar ones to many people. These are, however, only two of many well-known war stories from the Bible. Initially, warfare was one of the methods the Israelites employed to first settle a homeland. The location of that homeland, the strategic Syro-Palestinian corridor, guaranteed that they would be engaged in continual warfare, trying to secure the land and to protect themselves from invasions from Mesopotamia and Egypt.

Military Achievement

The first military engagements of the Hebrew people of the late Bronze Age were wars of conquest. These included, in Transjordan, the defeat of Sihon, king of Heshbon, and Og, king of Bashan, and the campaign against Midian, both of which are described in the biblical Book of Numbers. Later, Joshua ben Nun accomplished the occupation of Canaan, the Hebrew "promised land" west of the Jordan, through three strategic military actions, all of which are described in the biblical Book of Joshua. First, the Hebrews crossed the Jordan River opposite Jericho into the heart of the land, capturing Jericho, Ai, and Bethel. Second, a coalition of kings from five Canaanite city-states in the south were defeated and routed in battle at Gibeon, and a number of cities of the southern Shephelah were taken or destroyed. Finally, a league of Canaanite kings under the leadership of Jabin, king of Hazor, were defeated in battle at the "waters of Merom," in

Israel and Judah, c. 900 B.C.E.

northern Galilee, and their cities were taken by the Israelites (Joshua 11). These achievements were accomplished with a unified militia of Israelite tribes.

Although the unified strategy of Joshua ben Nun succeeded in defeating the coalition of forces capable of threatening Israel's position in Canaan, the task of mopping up fell to individual tribes at the beginning of the Iron Age (1200-1000 B.C.E.). The lack of tribal unity within the Israelite confederacy during this period allowed a resurgence of Canaanite power and the emergence along the Mediterranean coast of the Philistines, one group from among the earlier invading Sea Peoples that had been repulsed from Egypt by Ramses III (r. 1184-1153 B.C.E.) around 1168 B.C.E. According to extrabiblical records, the Philistines held a well-deserved reputation for martial skill and organization. In addition, they controlled a monopoly on iron metallurgy. Owing to these factors, the Israelite leaders, the judges Samuel and Saul, found themselves fighting defensive engagements. The lack of tribal unity also contributed to a period of civil war, described in the biblical Book of Judges.

After consolidating his reign in Judah and Israel, David (c. 1030-c. 962 B.C.E.) besieged and captured the Jebusite city of Jerusalem around 1000 B.C.E., making it the capital of his kingdom, as described in the biblical Book of 2 Samuel. After the Philistines heard that David had been made king of Israel, they moved to attack, but were defeated by David in the Valley of Rephaim and pursued to Gezer. David then campaigned to expand his kingdom, conquering the Moabites, Edomites, Ammonites, Aramaeans, and others. He instituted a standing army and placed garrisons throughout his growing empire. By such means he gained control of the trade along the Kings Highway east of the Jordan as well as the Via Maris, a lowland passage running through Israel to Damascus. Israel reached the zenith of its military and political power under David. Solomon (c. 991-930 B.C.E.), David's heir, maintained the same control and reigned from the great bend of the Euphrates to Elat on the Red Sea.

During the years of the divided monarchy, the southern kingdom of Judah and the northern kingdom of Israel were reduced to fighting each other in civil war or supporting each other in defensive battles against outside invasion. Two particular examples of the latter stand out. In 853 B.C.E. Ahab (c. 874-c. 853 B.C.E.), king of Israel, joined other small Canaanite and Syrian kingdoms in a coalition against Shalmaneser III (r. 858-824 B.C.E.), king of Assyria. Ahab was able to field 2,000 chariots and 18,000 infantrymen, some of them probably from Judah. The coalition met Shalmaneser III at Karkar in the Orontes Valley and stopped his advance. In 725 B.C.E. Shalmaneser V (r. 726-722 B.C.E.) laid siege to Samaria, the capital of Israel. Although the city held out for several years, it finally surrendered, and the kingdom of Israel disintegrated.

Judah remained a vassal-state of Assyria. However, at the end of the eighth century B.C.E. King Hezekiah of Judah (r. c. 715-c. 686 B.C.E.) revolted along with rulers of other

North Wind Picture Archives via AP Images

Hebrew leader Joshua ben Nun begins the occupation of Canaan, the Hebrew "promised land" west of the Jordan, with the taking of Jericho.

TURNING POINTS

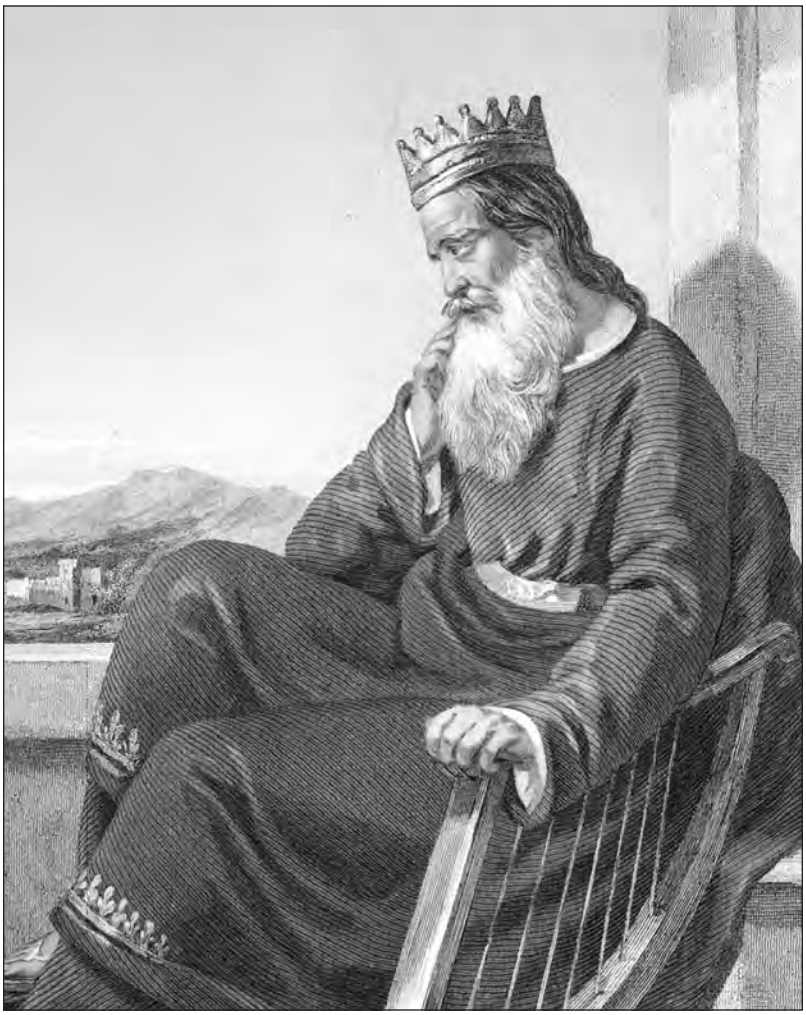
c. 13th cent. B.C.E.	The Hebrews conquer Transjordan and Canaan under the leadership of Joshua.
1000-990 B.C.E.	David consolidates the reign of Judah and Israel and defeats neighboring kingdoms of Moab, Edom, Ammon, and Aramaea, among others.
705-701 B.C.E.	Judean king Hezekiah leads rebellion against Assyrian domination.
587 B.C.E.	Jerusalem falls to the Neo-Babylonians.
167-161 B.C.E.	Judas Maccabeus leads campaigns against Greek rule.
39-37 B.C.E.	Herod is named king of Judea by the Roman Senate and leads campaigns to establish his kingdom.
66-70 C.E.	The Jews wage war against the Romans.
70	Jerusalem falls to the Romans.
73	The stronghold of Masada falls to the Romans after a three-year siege.

smaller kingdoms. The Neo-Assyrian king Sennacherib's (r. 704-681 B.C.E.) response was brutal. Every town in Judah was captured, and in 701 B.C.E. Sennacherib trapped Hezekiah in Jerusalem. In response to the Assyrian threat, Hezekiah reorganized the army, refortified Jerusalem, and redirected its water source, constructing the Siloam tunnel to bring water into the city. Sennacherib failed in his siege and returned to Assyria, where he was assassinated. The kingdom of Judah lasted until 587 B.C.E., when Jerusalem fell to the Neo-Babylonians.

For several centuries after the fall of Jerusalem the Hebrews were subject to foreign masters. Successively conquered by Babylon, Assyria, Persia, and Greece, they generally cooperated with rulers who tolerated their religious practices. Despite the pacifist strains of Isaiah and other prophets, the Jews could be quite bellicose in defending their religion. When Alexander the Great (356-323 B.C.E.) conquered Judea, he did not interfere with Jewish worship. However, one of his successors, Antiochus IV Epiphanes (c. 215-164 B.C.E.), decided to impose Greek culture on subject peoples, and around 167 B.C.E. constructed a statue of Zeus in the Holy Temple of Jerusalem, forbidding such practices as circumcision and the observance of the Sabbath. Rebellion again broke out in 167 B.C.E. under the Maccabees, a priestly family. The uprising began as a guerrilla war, but Judas Maccabeus (died 160 B.C.E.) organized the army along the old traditional lines. Fighting with small outnumbered forces, Judas proved to be a brilliant tactician accomplishing many difficult military feats. Judas and his brothers liberated Jerusalem and established a new independent Jewish state, with the kings and high priests both coming from the Maccabee family. Once independent, the Maccabees continued to wage war in Samaria, Transjordan, and among the descendants of the Edomites, forcing them to convert to Judaism. They also suppressed Jews who adopted Greek values and practices. For all their militarism, the Maccabees refused to fight on the Sabbath.

The later Maccabees allied with Rome and allowed Judea to fall under Roman control. Initially, the Romans tolerated the religion of Jews who did not challenge Roman authority. Jews were allowed to live and prosper throughout the empire, especially in Alexandria and Rome. The Roman Senate designated Herod the Great (r. 37-4 B.C.E.) king of Judea, but he had to fight for every inch of his kingdom. In the winter of 39 B.C.E. Herod returned to Palestine with the help of the Roman army. By 37 B.C.E. Herod had taken Jerusalem. Five years later Herod defeated the Nabateans and annexed a portion of their territory. Finally, by 20 B.C.E. Herod's kingdom had almost reached the size of that of David and Solomon.

Commonly, the Romans permitted conquered peoples to continue worshiping their gods, providing they acknowledged the Roman gods, including Caesar. However, monotheistic Judaism did not allow this accommodation, and guerrilla movements to resist Rome emerged in Judea. The Romans executed Jewish prophets and messiahs who challenged them. Among them may have been Jesus of Nazareth. One party, the Zealots, committed to purging Judea of all pagan elements, allegedly kidnapped and killed Jews



Getty Images

David, the Hebrew king of Judah and Israel, who besieged and captured the Jebusite city of Jerusalem and made it the capital of his kingdom.

who cooperated with Rome. In 66 C.E. the Jews revolted against Rome. The rebels set up a government in Jerusalem and divided the country into seven military districts. The emperor Nero (37-68 C.E.) sent his best general, Vespasian (9-79 C.E.), to quell the uprising. Vespasian systematically defeated the rebels until the Jews held only Jerusalem and the territory surrounding the city. Vespasian returned to Rome to be crowned emperor, leaving his son Titus (39-81 C.E.) in charge of the Siege of Jerusalem. By August 30, 70 C.E., Titus had taken the entire population of Jerusalem captive and leveled its buildings to the ground. A small group of rebels fled to the stronghold at Masada. They lasted until 73 C.E., when the Romans breached the walls. Approximately 960 defenders at Masada committed suicide during the night rather than surrender to the Romans.

WEAPONS, UNIFORMS, AND ARMOR

A wide range of offensive and defensive weapons are mentioned in biblical texts. None of these are in essence unique to the Israelite soldier. By the time of the Iron Age, the Hebrew soldier employed the same weaponry used in the surrounding ancient Near Eastern area.

The most practical offensive weapon was the small sword or dagger. It was fewer than 50 centimeters in length and generally used in short-range, hand-to-hand combat. The sword was carried in a sheath attached to the belt. The Israelites also used javelins and lances. The most significant long-range offensive weapon, however, was the bow and arrow. Arrowheads were first made of bronze and later iron. They were designed to pierce armor. David used a sling against Goliath, and soldiers from the tribe of Benjamin developed a deadly accuracy with this weapon.

The most common defensive arm, the leather buckler or shield, could be made in several sizes. Body armor, coats of mail, and helmets were available although probably were not common until the time of David. The defenders of Lachish, besieged by the forces of Sennacherib in 701 B.C.E., are shown wearing bronze helmets in the famous Assyrian bas-relief in the palace of Sennacherib at Nineveh.

MILITARY ORGANIZATION

At the end of the Bronze Age, military service was a part of the life of every capable male. Although some exceptions were granted, as described in the biblical Book of Deuteronomy, the survival of the nation as a whole depended upon the tribal fighting units that could be called up for battle as needed. These forces were voluntary and functioned on an as-needed basis. Soldiers returned to their homes and fields after the war.

A major change took place during the monarchy. Saul (r. c. 1020-1000) was the first to begin to recruit a more permanent army. David developed his own personal bodyguard and a professional army including several mercenaries. The Hebrew army was divided into units of 1,000 commanded by a leader. These units could be further divided into smaller groups of 100 and 50. Solomon was the first to establish a strong chariot force. Chariots were effective on the open plain, but they proved useless in the mountain terrain of much of Palestine.

DOCTRINE, STRATEGY, AND TACTICS

The early Hebrew army did not seem to do well in pitched battles on open terrain. Usually outnumbered, they were far more effective when they employed guerrilla tactics. Some of these included feints, decoys, ambushes, and diversionary maneuvers. Night movements and night attacks were also used. The Hebrews also developed a battle cry that would frighten or dishearten the enemy.

David instituted a particular military and political doctrine that provided great wealth for himself and his son Solomon. Even later, when the kings of Israel and Judah also followed this doctrine, political power and prosperity followed. First, David sought peace between Israel and Judah. Second, he exercised a strong hand in matters east of the Jordan. His plan was to subjugate the Aramaeans, Ammonites, Moabites, and Edomites, and thus to control the trade along the Kings Highway in Transjordan. Finally, David opened trade relations with the maritime nation of Hiram of Tyre (r. 969-936 B.C.E.).

ANCIENT SOURCES

A fair knowledge of the military achievements of the nations of the ancient Near East is revealed by the numerous paintings, drawings, reliefs, and inscriptions left behind. Even peace treaties describe the titles and functions of individuals in the army. The famous Assyrian bas-relief of the siege of Lachish was at Nineveh and is now held at the British Museum. It has a detailed depiction of Hebrew soldiers. However, information about the military organization of Israel from 1400 B.C.E. to the first century C.E. is not so complete.

The Hebrew Bible, or Old Testament, remains the primary resource for understanding the military achievements of the Hebrew people. Although there are extensive references to battles, the Bible is not a military history. Flavius Josephus, in his *Bellum Judaicum* (75-79 C.E.; *History of the Jewish War*, 1773), wrote about the Revolt of 66-70 C.E., in which he participated, later supporting the Romans. He later wrote *Antiquitates Judaicae* (93 C.E.; *The Antiquities of the Jews*, 1773). However, these books must be supplemented with archaeological and epigraphic discoveries from elsewhere in Egypt, Mesopotamia, and Palestine. Many of these are included in J. B. Pritchard's edited collection, *Ancient Near Eastern Texts Relating to the Old Testament* (1969).

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Stephen J. Andrews

The Egyptians

Dates: c. 3000-30 B.C.E.

Military Achievement

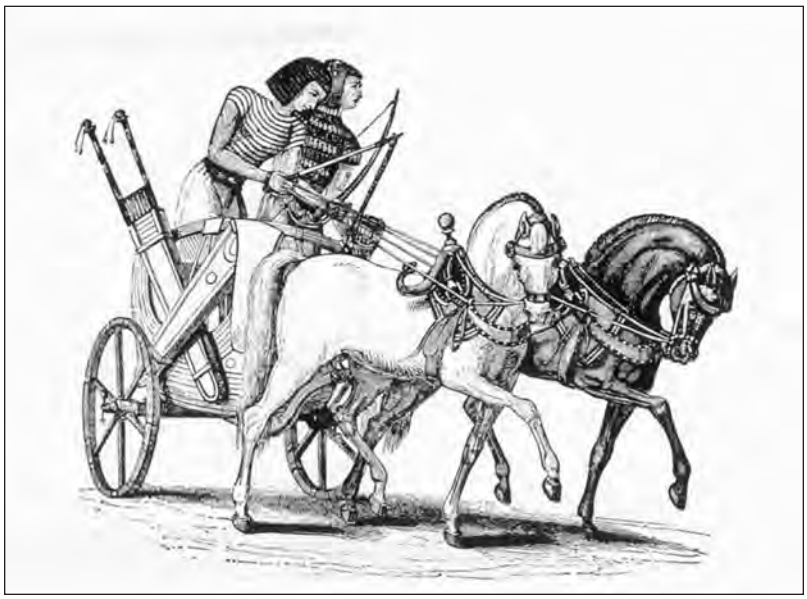
The Egyptian Empire was one of the longest-lasting in the ancient world, and it was largely kept together by military force rather than diplomacy. Its great wealth encouraged invasions such as those by the Hyksos, the Hittites, and the Sea Peoples. Later it was to face far greater threats from the Macedonians, and later still the Romans.

To combat these ever-present threats, the Egyptians did maintain a large army and navy. However, the chief innovations of Egyptian military thought were more in strategy and tactics than in weapons development. Although Egyptian military armaments remained relatively unchanged for millennia, the Egyptians' emphasis on indirect engagement and speed of movement—more than cultural conservatism—accounts for this lack of innovation.

Egyptian armies, from an early period, enlisted large numbers of foreign troops, foremost among whom were Nubian auxiliaries, renowned for their archery skills. The geology of southern Egypt, and the southern armies' use of Nubian troops, who were adept at desert warfare, led to wars of maneuver in the desert. Predynastic Period (c. 5300-3000 B.C.E.) and First Intermediate Period (c. 2160-2055 B.C.E.) forces used desert roads in order to outflank Nile Valley opponents. This emphasis on an indirect approach, and the Egyptians' apparent preference for projectile weapons and battles of speed, led to an increasing reliance on foreign troops during the first millennium B.C.E., as foreign troops became increasingly important. From the reign of Ptolemy IV Philopator (r. 221-205 B.C.E.), Egyptian soldiers were armed and trained in Hellenistic fashion.

Weapons, Uniforms, and Armor

The bow was the most important weapon in the Egyptian arsenal. Early ones were the simple bow with animal horns as the tip elements. The composite bow appeared in Egypt during the Second Intermediate Period (c. 1650-1550 B.C.E.) and became increasingly popular during the New Kingdom (c. 1550-1069 B.C.E.), partly in response to the increased use of body armor by many of Egypt's enemies. The bows of Libyan auxiliaries were small composite bows;



North Wind Picture Archives via AP Images

A nineteenth century representation of an Egyptian chariot team of driver and archer.

Nubian troops preferred the self bow. New Kingdom Egyptian chariots served as mobile archery platforms.

Pointed, and sometimes barbed, Egyptian arrows caused deep wounds. Broad, and sometimes flat-tipped, Egyptian arrows caused stunning injuries. Arrow tips were made from flint, horn, wood, and bone; copper tips had appeared by the time of the Middle Kingdom (c. 2055-1650 B.C.E.), and bronze tips by the time of the New Kingdom. There is slight evidence for the use of poisoned arrows. Arrows were carried in quivers; primarily during the Middle Kingdom bows and arrows together were at times held within a sleevelike quiver, open at each end.

Slings are attested, and surviving images have slingers appearing in the crows' nests of Egyptian warships. Late Coptic sources portray Egyptian women as adept at the use of the sling. The Egyptians also employed throw sticks in combat.

Spears appeared early in the Egyptian arsenal, both long, thrusting spears and short, stabbing spears. By the time of the Nineteenth Dynasty (1295-1186 B.C.E.) two spears had appeared in the arsenal of Egyptian chariot soldiers, to be used if the chariot became disabled. Throwing spears are also attested. New Kingdom troops at times carried both spear and battle-ax, possibly throwing spears prior to closing with axes.

Battle-axes, with blades of stone, copper, or bronze as technology evolved, were the preferred close-combat weapons. Early metal battle-axes had rounded blades. From the time of the Second Intermediate Period the standard shape was a long, roughly rectangular blade, convex on the cutting edge, with slightly concave sides. New Kingdom Libyan auxiliaries carried battle-axes with archaic, rounded blades.

The mace administered the coup de grâce to the heads of the mortally wounded, the origin of the pharaonic image of the ruler smiting the enemies of Egypt. Apparently common in earlier Egyptian forces as actual weapons with pear- and disc-shaped heads, the mace is rarely depicted outside smiting scenes and royal regalia. The mace becomes more visible in later New Kingdom scenes, in which it is larger, with a curved blade attached, beginning at the base of the mace head and coming to a point beyond the top of the mace head. The weight of the mace was apparently intended to help the blade pierce body armor.

A variety of staves and clubs were employed. A First Intermediate Period warrior refers to a staff of copper, perhaps a metal-sheathed staff, and fighting rods are relatively common in Ramessid Period (1295-1069 B.C.E.) battle scenes. These weapons, like the biblical "rod of iron," delivered crushing blows and became more prevalent during the later New Kingdom as a means of combating armored foes. Nubian foes and allies of the Egyptians often wielded wooden clubs with relatively narrow handles, swelling below the tip.

Soldiers carried daggers of various lengths, which could be used to remove a hand, or the phallus of an uncircumcised foe, from each slain enemy, a well-attested New Kingdom practice that allowed an accurate estimate of the strength of enemy forces. The slashing scimitar appeared in Egypt during the New Kingdom; mounted troops developed long, stabbing rapiers. Long swords and body armor appeared with Mediterranean mercenaries during the New Kingdom.

As in hunting, so in warfare, dogs frequently accompanied Egyptian soldiers into battle. Old Kingdom (c. 2686-2125 B.C.E.) and Middle Kingdom desert rangers often appeared with their dogs, usually basenjis. During the New Kingdom greyhound- and saluki-like hounds became more common in battle scenes. Ramses II (c. 1300-1213 B.C.E.) was accompanied into battle by a pet "battle-lion."

Early shields depicted on the Hunters Palette, a stone carving from the Predynastic Period, were small and irregular, perhaps made from turtle shells, like some more recent shields of Red Sea nomads. Shields during the Early Dynastic Period (c. 3000-2686 B.C.E.) were often large; tall, full-coverage shields are known from the time of the Middle Kingdom. Shields became smaller during the New Kingdom, rounded at the top and square at the bottom. During the New Kingdom they were often covered in animal hide, often with a metal boss in the upper middle. During melees New Kingdom soldiers often slung their shields over their shoulders with a diagonal strap, protecting their backs and necks while freeing both hands. At the end of the New Kingdom

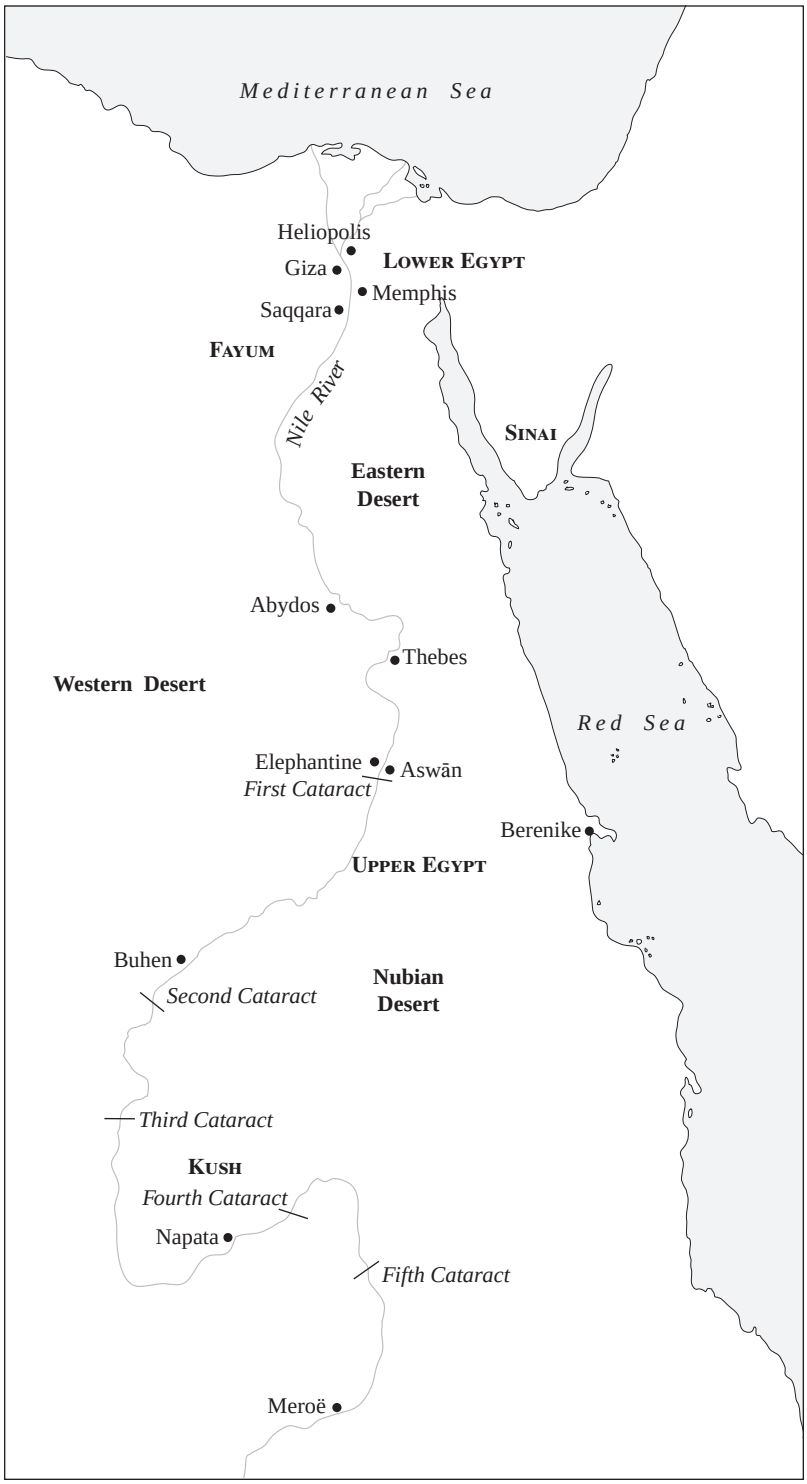
period, Mediterranean mercenaries introduced round shields into the Egyptian arsenal.

The chariot appeared in Egypt's arsenal at the beginning of the Eighteenth Dynasty (1550-1295 B.C.E.) and presumably had entered the land during the Second Intermediate Period, when the Hyksos, an Eastern Mediterranean maritime power, dominated northern Egypt. Egyptian chariots were light, usually with a rear-mounted wheel, and carried a driver and an archer. Horses wore protective armor, or bardings. Egypt's opponents followed this pattern until the Hittites, under pressure from heavily armored troops in their western marches, adopted a heavier chariot with three occupants, used for rapid transport of infantry rather than for archery. Egyptian chariotry did not adopt such a response to the rise of heavy infantry. Runners accompanied chariots; many were foreign mercenaries who protected the chariots and horses and attempted to capture those of the enemy.

The earliest Egyptian chariots had wheels with four spokes. During the middle of the Eighteenth Dynasty, six spokes became standard. Egyptian chariots had a cab with a D-shaped floor plan; a curved wooden banister at waist level in front stretched back and down to the rear floor. The light bodies could be partially closed with wood or leather sidings. Floors of rope or leather mesh absorbed the shock of rough terrain. Side-mounted cases held bows and arrows and, from the time of the Nineteenth Dynasty, spears.

The infrequently attested use of mounted troops was primarily as reconnaissance patrols and couriers.

OLD KINGDOM EGYPT, C. 2686-C. 2125 B.C.E.



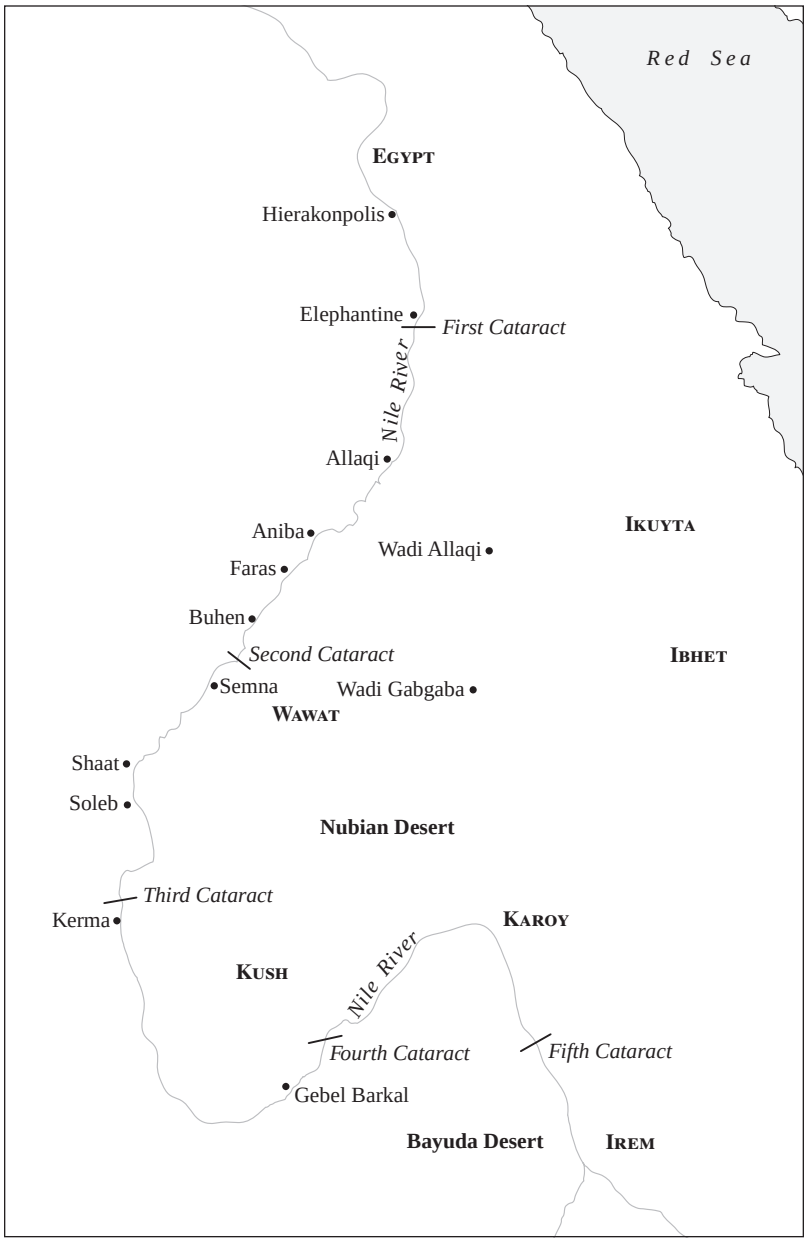
Many of these cavalry troopers were Nubians. Roads and remount stations were maintained for these patrols.

Wheeled siege ladders appeared during the late Old Kingdom and the First Intermediate Period. Sapping is attested, often performed by soldiers with hand weapons. In one Middle Kingdom scene, three men within a protective testudo siege engine work a long pole, similar to a crowbar, against the walls of a fortress. The use of sloping glacis at the bases of fortress walls by the time of the Middle Kingdom suggests the use of similar sapping, and would also have deterred the use of battering rams.

Supposed evidence for stone-throwing machines from the Twenty-fifth Dynasty (747-656 B.C.E.) is based on faulty translations. Siege ramps, apparently of earth and wood, with platforms for archers and slingers, are attested. When the Nubian ruler Piye (747-716 B.C.E.) attacked Memphis by land and river, his marines used their ships' spars to scale the river walls of the city, and the construction of a siege ramp held down many of the defenders of the land walls.

Climate and Egyptian emphasis on speed of movement and flanking maneuvers through the deserts flanking the Nile Valley discouraged the development of body armor. A metal breast protector appears in a Middle Kingdom scene, but during the Old Kingdom and Middle Kingdom the only garments common on soldiers' torsos were crossed textile bands. Quilted and leather protection for the torso appeared during the New Kingdom, usually in the form of bands wrapped around the chest and over one shoulder. Textile or leather shirts with metal and leather scale armor also appeared during the New Kingdom, primarily providing protection for chariot warriors. During the New Kingdom, Mediterranean pirates and mercenaries in Egyptian service began to wear significant metal body armor;

EIGHTEENTH DYNASTY EGYPT, C. 1550-1295 B.C.E.



however, it is unclear to what extent native troops adopted such armor.

Nubian auxiliaries wore leather sporrans, or pouches, during both the First Intermediate Period and Middle Kingdom. Large, heart-shaped, quilted sporrans appeared during the New Kingdom. These elements of clothing appear to have functioned as protection for the groin area. Soldiers often wore a leather overkilt, cut to have the appearance of a leather net with a seat patch.

Middle Kingdom soldiers, as revealed by mummified remains at Deir el-Bahri, a temple site on the west bank of the Nile near Thebes, wore their hair thick and greased, forming a natural protection against blows to the head and neck. Textile head coverings are well attested, and there is sporadic evidence for helmets during the New Kingdom.

MILITARY ORGANIZATION

Early Egyptian forces were divided between infantry and archers; during the New Kingdom the chief divisions were between chariotry and foot soldiers. The smallest independently operating units appear to have been of ten men, with a squad leader; during the New Kingdom the smallest units appear to have been fifty men. The New Kingdom saw the emergence of a complex military hierarchy. Armies were equipped by various temples, institutions that fulfilled many important economic functions in Egypt. The four armies of Ramses II (r. 1279-1213 B.C.E.) at Kadesh were named for four deities. Mercenaries were important, and there were early units of Nubian troops, usually archers. Libyans and Mediterranean mercenaries and pirates were also important. Each independently operating unit had at least one scribe. During the Ptolemaic (332-30 B.C.E.) and Roman (30 B.C.E.-395 C.E.) periods, Hellenistic and Roman military practices supplanted earlier Egyptian practices.

DOCTRINE, STRATEGY, AND TACTICS

As the primary role for the Egyptians was defense, fortified positions first appeared during the Predynastic Period. During the Middle Kingdom, a series of fortresses, watch posts, and patrol roads created an elaborate system of defense in depth at the Second Cataract of the Nile in Nubia, the southern boundary of direct Egyptian control and influence in the south. The complexity and extent of this system presaged later Roman achievements. Roman border defenses, and their Egyptian precursors, consisted of three types: defense by client states, with lightly defended legionary camps; perimeter defense; and defense in depth. Perimeter defense involved main fortresses behind outer defenses, with patrol roads and watchtowers stretching back to the fortresses. In defense in depth, larger and more heavily fortified fortresses were intended to stand alone in areas periodically overrun by foes.

Middle Kingdom Egyptian forts in Nubia developed in almost the opposite way. Initially they were well-fortified outposts in a perimeter defense, part of an elaborate system of patrol roads and watch posts, befitting their location in the low desert plain. Later Middle Kingdom forts on the southern end of the Second Cataract were, like later Roman fortresses, heavily fortified, with spur walls for enfilading fire, atop granite outcroppings, a response to the rise of the powerful Kerman state in Nubia. The Middle Kingdom fortresses in Nubia were supply depots and strongholds allowing the extension of Egyptian patrols into the far south.

By the time of Thutmose II (r. 1492-1479 B.C.E.) there were client states in Nubia, and the New Kingdom fortress of Buhen was less heavily defended, like the later Roman fortresses of the perimeter defense system. During the New Kingdom Egypt had a *foederati*-like arrangement with more developed Nubian client states. Nubia was important to Egypt as a source of military manpower, and the point of origin or transshipment of many goods, including gold and incense.

A network of patrol roads, camps, and watch posts stretched through the Western Desert during the Middle Kingdom, and the Theban Seventeenth Dynasty (c. 1580-1550 B.C.E.) maintained and elaborated upon certain elements of this system. Fortresses also guarded the eastern Nile Delta; a Middle Kingdom fortress in the Wadi an-Naṭrūn implies a similar

line guarding the Western Delta. During the reign of Ramses II a line of fortresses guarded the approach to the Delta between the Mediterranean coast and the Qattara Depression.

Chariotry dominated late Bronze Age battlefields, on which the vehicles initially served as mobile archery platforms. A reliance on the expensive chariot arm was possible only for the wealthiest states of the ancient Near East, allowing those states to rely on small, elite forces, a desirable situation for complex societies in which labor was needed in many fields. Chariotry was ineffective against massed barbarian infantry and unsuited to mountainous or forested terrain. In battles in which chariotry was the principal arm, infantry provided support. At the Battle of Kadesh (1274 B.C.E.) under Ramses II, an infantry division assured the Egyptians' tactical success.

Unlike the Nubians, the Egyptians never permanently occupied Asia. In the northeast, Egypt supported the lesser of two conflicting powers, thereby seeking to create buffer states that, with Egyptian aid, might oppose a third power, but could not alone pose a threat to Egypt.

Amphibious infantry landings are known from the late Old Kingdom and the First Intermediate Period. During the Seventeenth Dynasty, Kamose (r. 1555-1550 B.C.E.) employed warships in three lines ahead, the central line breaking the enemy line and flanking lines preventing enemy escape. Kamose could thereby break the line of the Hyksos battle squadron and capture its merchant fleet. Thutmose III (r. 1479-1425 B.C.E.) constructed ships in sections on the Mediterranean coast and transported them overland for an amphibious attack on the Euphrates.

When invasions of marauding Sea Peoples occurred during the reign of Ramses III (r. 1184-1153 B.C.E.), various ships, including smaller Nile warships, protected the Nile Delta. Archers and grappling hooks and lines for capsizing enemy warships were the main offensive weapons. Large ships filled with troops appear to have broken the formations of the attacking enemy. Smaller vessels, able to operate in the treacherous areas of sandbanks near the mouths of the Nile, completed the destruction of the enemy. Ramming apparently was not practiced until the Ptolemaic and Roman periods.

Considering the importance of religion in Egyptian culture, it is to be expected that religion should serve military purposes as well. The names of foreign and domestic foes were written on small, usually clay images of bound enemies, and buried in execration rituals. Warfare was equated with hunting, both activities asserting Egyptian authority and control over chaotic forces and contributing to the proper order of the cosmos.

ANCIENT SOURCES

The considerable accomplishments of the ancient Egyptians in the realm of tactics must be reconstructed from much disparate and indirect evidence, and the lack of any true military treatise from ancient Egypt means that much information has been lost. Military scribes kept daybook accounts of expeditions, excerpts of which appeared occasionally in inscriptions, such as those of Thutmose III at Karnak. The ancient Egyptians stressed the timeless importance of events and of history as festival, an emphasis leading to a lack of what might be considered truly historical accounts of military activities.

However, although these manuscripts have not survived, there are numerous scenes and inscriptions recounting military activity which do survive, the earliest from the late Gerzean Period (c. 3500-3200 B.C.E.). Some actually show the recording of military events, and there are many bas-reliefs showing chariots, soldiers and ships.

In addition, many actual weapons, and even some chariots, have survived. Some of those, such as the throwing sticks in the tomb of Tutankhamen of the Eighteenth Dynasty, were clearly decorative, but there are also swords, knives, and bows that do survive, from the tomb of Tutankhamen, and from archaeological sites both much older and more recent than the Eigh-

teenth Dynasty. Other information comes from bodies and skeletons, some of which show the effects of Egyptian weaponry.

Some contemporary written accounts exist from non-Egyptian sources. These include the Bible, which mentions the Egyptians in the Book of Exodus and other parts. Herodotus, in his *Historiai Herodotou* (c. 424 B.C.E.; *The History*, 1709), provides some descriptions of the Egyptians in battle. There are far more extensive written sources from the Hellenistic period from the works of Arrian, the *Anabasis Alexandri* (early second century C.E.; *The Campaigns of Alexander*, 1893), and also from the writings of Plutarch (c. 100 C.E.).

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John Coleman Darnell

The Persians

Dates: To 651 C.E.

Military Achievement

The Persians were an Iranian-speaking, Indo-European people. As described in both the *Rigveda* and the *Avesta*, the sacred texts of Hinduism and Zoroastrianism respectively, warriors played an important part in Persian society. The warrior class, from which chiefs and kings were chosen, was second in status only to that of the priests. However, these religious texts, written by priests, may overemphasize the importance of the priest class within Persian society. Horses were important to the Persians, who used them effectively against both the native inhabitants of the Iranian plateau and their Mesopotamian neighbors, especially the Assyrians, whose military technology was the most advanced in the world in the first millennium B.C.E. Ancient Persian history can be divided into three periods: the Achaemenid Persian period (550-330 B.C.E.), the Hellenic and Parthian period (330 B.C.E.-224 C.E.), and the Sāsānian period (224-651 C.E.).

Achaemenid Persian Period

The Achaemenid Persians achieved supremacy by 550 B.C.E. after their leader, Cyrus the Great (r. 550-529 B.C.E.), had conquered the Iranian plateau, Mesopotamia, Levant, and Anatolia. The Achaemenid Persians defeated their cousins, the Medes, who had previously defeated the Assyrians. Cyrus's successors, Cambyses II (r. 529-522 B.C.E.) and Darius I (r. 522-486 B.C.E.), conquered Egypt, Nubia, Libya, and Central Asia, forming the largest empire known to the world at that time. The Achaemenid Persian Empire was matched only by that of Alexander the Great (356-323 B.C.E.), who later conquered the Persian Empire. For two centuries the Persians maintained a vast empire with a large army requiring a large administrative apparatus. Only the Greeks were able to resist the Persians, and the struggle between the two civilizations became a focal point of Greek and Western historiography.

Hellenic and the Parthian Period

After the Greek conquest of Persia in 330 B.C.E., Seleucus I (between 358 and 354-281 B.C.E.), one of Alexander's generals, took over the Asiatic portion of the Persian Empire and formed the Seleucid Dynasty. The Seleucid Empire centered on Syria and extended, at its peak, from the Mediterranean Sea to as far east as India's Indus Valley. By 238 B.C.E. an Iranian group known as the Parthians had established themselves in the eastern portion of the Persian Empire, in the area that encompasses the modern Iranian province of Khurāsān and part of southern Turkmenistan. Because the Parthians were a nomadic group, the cavalry remained the most important aspect of the Persian army during this period. The Parthians were able to defend themselves against the Roman forces, defeating the Romans in several key battles.

Sāsānian Period

The Sāsānian Dynasty was established in 224 C.E. by Ardashīr I (r. c. 224-241 C.E.), who revived the Achaemenid religious tradition of Zoroastrianism and made it the official religion. From the outset of their reign, the Sāsānian were able to defeat the Romans and all other competing forces in Southwest Asia. The Sāsānian controlled Central Asia, the Iranian Plateau, and Mesopotamia, and made major incursions into Syria. Throughout the third century they repeatedly defeated Roman forces, killing one emperor, capturing another, and forcing a third to pay a ransom for the safety of his army. Seventh century Sāsānian forces conquered Palestine, Egypt, and Anatolia, laying siege to the Byzantine capital, Constantinople. For four centuries, the Sāsānian successfully defended their empire from invasions by the Turkic tribes and the Kushāns from the east, the Ro-

Library of Congress

The Persian forces of Darius I the Great employ elephants in battle against the forces of Alexander the Great at Gaugamela (331 C.E.).

mans, Byzantines, and Arabs from the west, and the nomadic tribes from the north.

WEAPONS, UNIFORMS, AND ARMOR

The sacred Zoroastrian text, the *Avesta*, mentions weapons and war sporadically. Certain Zoroastrian gods, such as Wahrām, had been worshiped by the military since well before the time of the Achaemenid Persians. Wahrām, whose name means "offensive victory," could take on many forms, mainly those of fierce beasts. The goddess Anahitā was another deity from whom the Persians sought aid in battle against their enemies. Prayers were usually accompanied with sacrifices and ritual acts.

Greek and Iranian sources indicate that the elite Persian forces wore long, draped robes with trousers, as well as coats of mail covering their chests. The Greek historian Xenophon (430-354 B.C.E.) states that Persian cavalry forces carried javelins and wore breastplates, armor, and helmets. Xenophon also mentions various standards, or banners carried in battle, specifically the royal standard, a spread-winged eagle on a shield.

The Persian infantry wore loose tunics with corselets of metal scales underneath for protection from spear thrusts. They wore felt hoods and helmets

Persian Empire, c. 500 B.C.E.

for head protection and carried short swords, lances with wooden shafts and metal points, quivers full of arrows with bronze or iron points, bows with ends shaped like animals' heads, and wicker shields of different shapes.

Greek sources tend to exaggerate the numbers of Persian forces, with estimates ranging from 900 thousand to 5 million. The main reason for such exaggeration was to boast the Greeks' ability to repel Achaemenid aggression during the Greco-Persian Wars (499-448 B.C.E.). The Persian navy, stationed at Cilicia on the Mediterranean coast, was composed mainly of foreigners, such as the Phoenicians, Greeks, and Egyptians. The mercenary status of the Persian navy was a reason for its defeat against the Greek navy; when the war became difficult or its outcome unsure, the Persian naval commanders either retreated or left altogether. The lack of a competent naval force would be a major reason that the Achaemenid Persians were ultimately unsuccessful against the Greek city-states.

MILITARY ORGANIZATION

The success of the Persian military was based on the capability of its military leaders and its army. Greek sources provide ample information on the composition of the Persian army, especially during the Greco-Persian Wars. The Persian nomadic forces that conquered the Medes were turned into organized standing forces composed of both Persians and Medians. These forces consisted of both cavalry, which included chariots, horses, and camels, and infantry, which included lance bearers and bowmen. As more people, including Greeks, Lydians, and Mesopotamians, were incorporated into the Persian Empire, they were also brought into the army. Greek mercenaries were used from the time of Cambyses in the sixth century B.C.E.

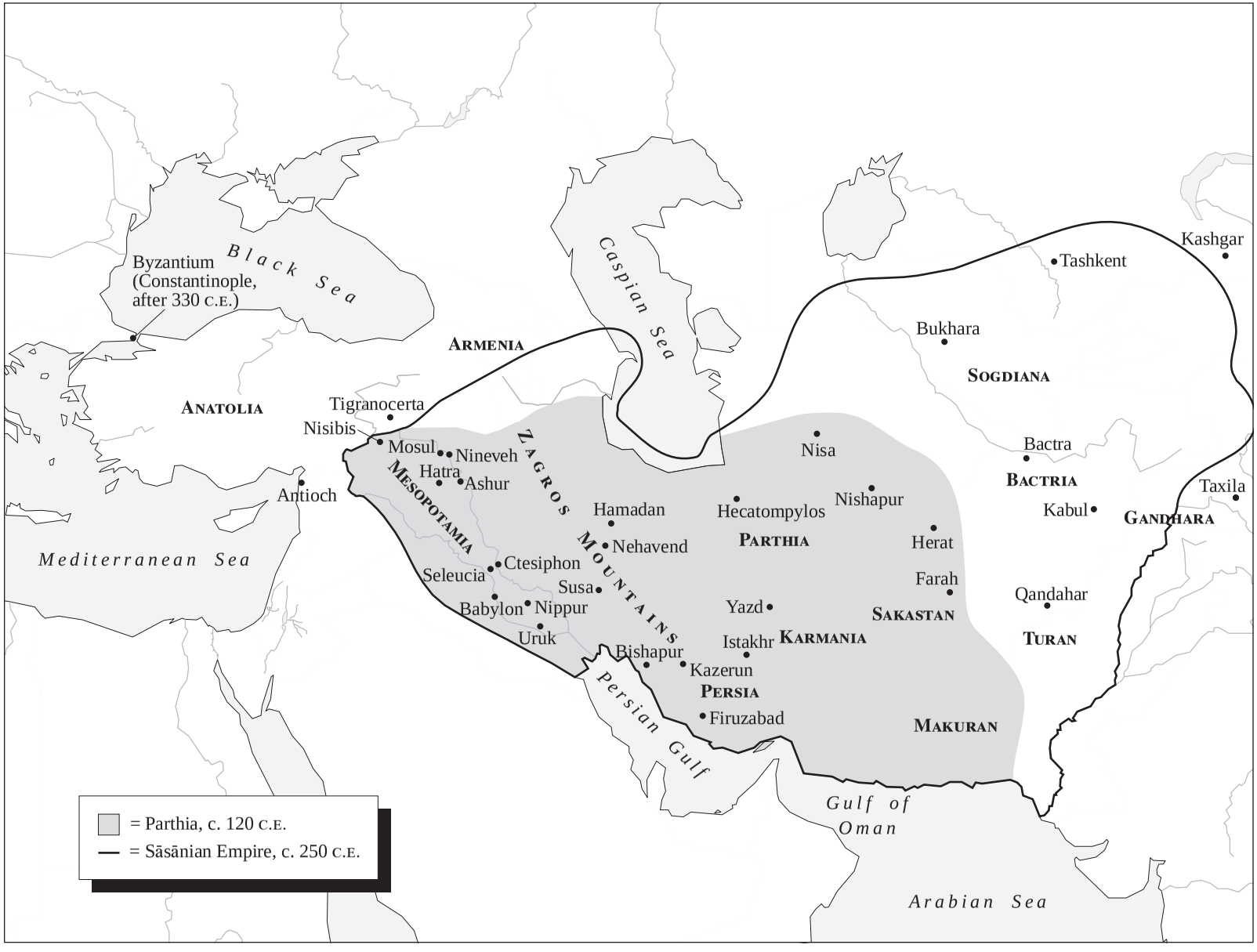
The Persian army's sophisticated training regiment of elite forces was drawn from the ranks of the nobility. In a system resembling that of the Spartans, who trained soldiers from youth, the Persians selectively trained certain youths, who passed required tests, to be warriors. According to Greek sources, the youths who were accepted into warrior society were taught various athletic, farming, and craft skills. As they matured, they were trained in the military arts, such as archery, spear and javelin throwing, and marching. In addition to these elite warrior forces, there were special forces composed of hardened warriors who acted as a sort of secret service.

The Persian army was divided according to the decimal system, in units of tens, hundreds, and thousands. Greek sources mention an elite Persian force known as the Immortals, composed of ten thousand men and so called because previously selected men waited to fill the places of casualties in battle. The Immortals reportedly included spearmen of Persian nobility: one thousand in the cavalry and ten thousand in the infantry. Of these ten thousand infantrymen, one thousand had golden pomegranates instead of spikes on the butt-ends of their spears. They marched in two sections, one ahead of and the other behind the remaining nine thousand Immortals, whose spears had silver pomegranates.

After 238 B.C.E. when the Parthians came to dominate the Persian Empire, the heavily armored cavalry, known as *cataphracts*, became the elite forces of the army. The extremely accurate mounted bowmen of the Parthian cavalry repeatedly defeated the Romans with their famed maneuvering techniques. The most famous of these techniques, riding a horse while shooting arrows backward, came to be known as the Parthian shot. Parthian horses were covered with mail to protect them from attacks by Roman infantrymen. Another unit of lighter, more mobile cavalry also carried bows and arrows. At the Battle of Carrhae in 53 B.C.E., Roman troops under the general Crassus were destroyed by the Parthian cavalry, which harassed the Roman infantry until it broke ranks, at which point the Parthian cavalry pursued and cut the Roman foot soldiers to pieces. People from other regions were also used in the Parthian forces as either light cavalry or infantry. The infantry was the second group of the army and it was usually considered to be weak and untrained and less reliable in wars.

In the fourth century C.E. Roman soldier and historian Ammianus Marcellinus (c. 330-395) described the Persian cavalry as clad in body armor, mailed

Parthian and Sāsānian Empires, c. 230 B.C.E.-500 C.E.



coats, breastplates, leg armor plates, and helmets with holes only for the eyes. The Persian cavalry horses were also covered with armor. The grotto of King Xusrō II (590-628 C.E.) at Tāq-i Bustān in northern Persia represents the culmination of the advancement in armor. The Persian weapons, based on the descriptions of Muslim historians, included swords, lances, shields, maces, battle-axes, clubs, bow cases containing two bows with their strings, thirty arrows, and two plaited cords. By the sixth century the chancery of warriors set a stable stipend for cavalry. It was from among these soldiers that the the Immortals, the elite corps of the Achaemenid Persians, were chosen. Their leader was probably the *puštigbān-sālār*, or "commander of the royal guard."

There was also a light cavalry composed of mercenaries or tribespeople in the empire, including the Dailamites, Gīlānīs, Georgians, Armenians, Turks, Arabs, Kushāns, Khazars, and Hephthalites. The other form of cavalry used in wars were the elephant corps, or *pīl-bānān*. Ammianus Marcellinus described the elephants as having awful figures and savage, gaping mouths. They looked like walking towers and scarcely could be endured by the faint-hearted. According to Muslim historians, elephants were used as early as the third century C.E. by the Sāsānians, who used them to raze such cities as Hatra. Sāsānian king Pīrōz I (r. 457/459-484 C.E.) used fifty elephants in his campaign against the Ephthalites in the fifth century. Elephants were again used against the Arabs in the seventh century.

The infantry, or *paygān*, was headed by the *paygān-sālār*, or "commander of the infantry." Infantrymen were fitted with shields and lances. Behind them in formation were the archers, who actually started the war with volleys of shots into the enemy camp before the cavalry charged. The *Strategikon* (c. 580 C.E.; English translation, 1984) of Flavius Tiberius Mauricius (c. 539-602 C.E.), a Byzantine emperor who reigned from 582 to 602 C.E., gives detailed information on the differences in strategies between the Persian and the Roman soldiers, as well as the intricacies and differences in their weapons and their uses. Naturally the cavalry and infantry forces required a huge logistical apparatus that was sustained by conscripts from the general population. These forces prepared food, repaired weapons, tended to the wounded, and established camps, among other tasks. The Sāsānians also utilized Roman techniques in the use of siege weapons including ballistae, battering rams, moving towers, and catapults. The Sāsānian navy had been instrumental from the beginning of the Sāsānian period, when the founder of the Sāsānian Persian dynasty, Ardašhīr I (r. 224-241), conquered the Arab side of the Persian Gulf. The control of the Persian Gulf was necessary both militarily and economically, to make it safe from piracy and Roman encroachment. Based on the accounts of Muslim historians, it appears that the Persian ships held one hundred men but were not very important to the military.

Other Persian titles and classifications are from later sources that describe several other military positions, including commander of the forts, warden of marches, the hereditary title of the general of Tus, in northeastern Persia, and the army general. The warrior estate also had a designated Zoroastrian fire temple known as Adur Gušhnasp. This fire temple was at Šhīz, in northwestern Persia, where the king and the warriors went to worship. Rulers such as the Sāsānian king Bahrām V, or Bahrām Gūr (fl. fifth century C.E.), sent the booty of jewelry to be hung in the Zoroastrian fire temple after defeating the Turks in his campaign against them. Ardashīr I also made offerings—the heads of rebels—to the fire temple of Anāhīd.

During the Sāsānian period the warrior class formed the second tier of the social structure; the function of the warrior was to protect the empire and its subjects. There were several divisions within the military, and within the cavalry and infantry. As clergy attended seminaries, the soldiers attended academies where they were trained in the military sciences. The alliance between the priests and the warriors was of paramount importance; the idea of *ērān-sahr*, which had manifested itself under the Sāsānian as that of a set territory ruled by the warrior aristocracy, had been developed and revived by Zoroastrian priests. Under the Zoroastrian religion, which was made the official state religion during the Sāsānian period, church and state were considered inseparable from each other. In reality, however,

each group attempted to impose its will on the other, and this long battle caused the final fragmentation and the weakening of the Persian Empire.

DOCTRINE, STRATEGY, AND TACTICS

Although Achaemenid Persian forces were superior on the ground, their weakness was on the seas, where they mainly employed mercenary forces. At the battles, it was the norm for the king to be present to watch over the battle lines and to engage in battle as well. Before each individual battle a council decided the plan and the strategy the forces would follow. In terms of the military attack, the foot soldiers and the foot archers were stationed in the front and in the middle, flanked by the cavalry and the armed forces. To begin the war, the archers began sending volleys of arrows toward the enemy, then the spearmen and the cavalry came into action. These tactics were successful against the people of the Near East, but they did not crush the Greeks, who, with their hoplite forces, were able to withstand the Persians. Man-to-man combat was also known, and it was a sign of heroic deed to defeat one's enemy in this manner. Cyrus the Younger (c. 424-401 B.C.E.), versed in the Greek tactics, was able to strengthen the Persian military capabilities by enlisting Greek hoplite forces into his army. This group was aided by a heavily armored but ineffective cavalry. Xenophon mentions the Persian cavalry kept their seat only through the pressure of their knees, indicating that they lacked stirrup and saddle.

During the Sāsānian period, there existed manuals of warfare that have since been lost. Portions, however, remain extant in Middle Persian and Arabic texts. The Middle Persian text known as the *Dīnkart* (ninth century C.E.; acts of religion) contains a section devoted to the military. This manual informed soldiers about tactics and rations for food, methods for dealing with war prisoners, and the positions for specific forces. For example, the text mentions that the cavalry should be in front and that left-handed archers should be put on the left flank to defend the army. The center should be on an elevated place, where the army commander could be supported by the infantry. The army should also be placed with the sun and the wind at their backs to blind and hamper the capability of the enemy.

ANCIENT SOURCES

Sources for the earliest history of the Persians come from the sacred book of the Zoroastrians, the *Avesta*, in which references to combat and weapons are made. The Old Persian sources of the Achaemenid period also give some terminology on weapons, but the Greek sources furnish much more. Herodotus (c. 484-424 B.C.E.), Xenophon, and Strabo (64 or 63-after 23 B.C.E.) are the chief Greek sources, providing many details of the Persian army and their tactics. For the Hellenic and the Parthian period classical authors such as Herodian (third century C.E.), Pliny (23-79 C.E.), and Plutarch (c. 46-after 120) are the major sources. For the Sāsānian period, there are a variety of sources not limited to the classical authors. Among the Greek and Latin sources, Ammianus Marcellinus is quite informative on Persian siege tactics, armor, and military. Sāsānian sources such as the *Dīnkart* are primary sources, whereas the Arabic and Persian sources after the seventh century C.E. give much information; the best of these is Abū Jaʿfar Muḥammad ibn Jarīr al-Ṭabarī's *Taʾrīkh al-rusul wa al-mulūk* (872-973; *The History of al-Ṭabarī*, 1985-1999, 39 volumes).

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Touraj Daryaee

THE ANCIENT WORLD

EUROPE AND THE MEDITERRANEAN

Greek Warfare to Alexander

Dates: c. 1600-336 B.C.E.

Military Achievement

The period from 1600 to 336 B.C.E. saw the emergence in Greece of four distinct ways of war. The first of these, Mycenaean chariot warfare, did not survive past about 1100 B.C.E. It was succeeded by an infantry-based system of individual combat, often called "heroic" because of its prominence in Homer's *Iliad* (c. 750 B.C.E.; English translation, 1611) and *Odyssey* (c. 725 B.C.E.; English translation, 1614). This system in turn gave way to the close-order infantry warfare of classical Greece. A fourth way of war, the combined arms system developed by the Macedonians in the mid-fourth century B.C.E., ultimately overcame the classical Greeks and provided the basis for the conquests of Alexander the Great.

Mycenaean civilization, named after the citadel of Mycenae in southern Greece, emerged about 1600 B.C.E. and reached its height between 1400 and 1200 B.C.E. Mycenaean monarchs ruled from fortified royal palaces, which were economic as well as political and religious centers. Palaces flourished at Mycenae, Pylos, Tiryns, Thebes, and elsewhere on mainland Greece, as well as at Knossos on the island of Crete. These citadels shared a common culture but were not politically unified. Mycenaean society was hierarchical and bureaucratic; professional scribes used clay tablets and a script called Linear B to track everything that entered or left the palaces. Although little conclusive evidence survives, it appears that Mycenaean armies relied heavily on chariots, perhaps supported by infantry. As in the contemporary Egyptian and Hittite military systems, these chariots probably served as mobile fighting platforms for aristocratic archers and spearmen.

For uncertain reasons, Mycenaean civilization began to collapse around 1250 B.C.E. Indeed, there were upheavals throughout the Mediterranean at this time; the fictional story of the Trojan War reflects later poetic memories of these disturbances. In mainland Greece, the palaces were burned, the countryside was depopulated, and Linear B script disappeared. The chariot forces, dependent on logistical support from the palaces, also declined. Consequently, foot soldiers seem to have gained greater prominence in late Mycenaean warfare. By 1100 B.C.E., however, the great Mycenaean centers and the military system they supported had disappeared completely.

The centuries (1100-750 B.C.E.) following the destruction of Mycenaean civilization are often designated the Greek Dark Age. As petty chieftains replaced Mycenaean kings, warfare became sporadic and local, in the form of raids for booty and individual duels between aristocratic champions. The Homeric poems suggest that Dark Age or heroic warriors preferred spears to swords; spears could be thrown from a distance or used hand to hand. Archery, however, was disdained as barbaric and unfair. Chariots may have continued in limited use, perhaps as transports to and from battle. Eventually aristocrats also began to fight from horseback, as cavalry. Yet the most significant military development of the Dark Age was metallurgical: By 900 B.C.E., iron weapons were in widespread use.

By 800 B.C.E. Greece was recovering from the Dark Age. Renewed commerce with the wider Mediterranean world led around 750 B.C.E. to the introduction of the alphabet. During the eighth century B.C.E., increased population and prosperity throughout Greece fostered the rise of the polis, or city-state. A polis (plural, poleis) was a self-governing political unit with a defined territory. Eventually there were more than a thousand poleis in Greece, each one with its own laws, calendar, and military organization. Athens and Sparta, the best known of these states, were exceptionally large in territory and population. Most other poleis were relatively small, with perhaps a few hundred citizens each. Polis governments came

ATHENIAN EMPIRE, FIFTH CENTURY B.C.E.

in many forms, but all included an assembly of adult male citizens and a council of elders. Political rights and military service were closely linked, so the new emphasis on community over individualism soon transferred into warfare. By about 650 B.C.E. a communal way of war, the hoplite system, had supplanted the individual aristocratic fighting of the Dark Age.

The hoplite was a heavily armored spearman who fought alongside his fellow citizens in a close-order formation called a phalanx. Because hoplites were required to provide their own equipment, most hoplites were middle-class farmers who could afford metal arms and armor. Because citizen farmers could not spare time for extensive training, hoplites were militia, rather than professional, forces. Battles were limited, ritualized affairs, fought on the borderlands between poleis during lulls in the agricultural schedule. There was little in the way of tactics or strategy: Opposing phalanxes lined up against each other on flat open ground, listened to speeches and performed sacrifices, then marched forward against each other. Inevitably one side won the shoving match that followed. Although the losers broke and ran, the victors

usually preferred to strip the enemy dead, erect a trophy, and head home. Pursuit after battle was rare. Hoplite warfare, then, did not often result in the complete subjugation of the losing opponent.

The great achievement of the hoplite system was not so much military as political. Hoplite warfare demanded teamwork. There was no room for displays of individual heroism. The communal structure of the phalanx thus reinforced the community spirit of the polis. The hoplite system also helped confine the destructiveness of war to decisive single-day struggles that would not interfere with farming. It therefore gave middle-class agrarians a monopoly on organized violence. Aristocrats were relegated to the cavalry, which usually played only a minor battlefield role. Poor men who could not afford arms and armor were left out of battle altogether, unless they served as slingers or rock throwers.

Sparta was the exception to the hoplite rule. Threatened by military defeat and internal disorder during the mid-seventh century B.C.E., the Spartans responded by turning their state into an armed camp. Spartan boys began military training at age seven. For most of their adult lives, even when married, they lived in sex-segregated barracks rather than private homes. Girls also received military training. Adult male Spartan citizens, or Spartiates, practiced almost constantly for war, giving Sparta the only professional phalanx in all of Greece. Unlike the militiamen of other city-states, Spartan hoplites marched in step to the sound of flutes and could carry out complex tactical maneuvers. This drill and discipline made the Spartan army invincible on the battlefield. Yet in order to free its citizens for war, Sparta's economy had to rely on the labor of helots, serfs who worked the land for their Spartiate masters. Fear of helot revolts often kept the Spartan army at home, thus inhibiting Spartan control of the whole Greek world.

For more than two centuries, the hoplite reigned supreme on Greek battlefields. The Greco-Persian Wars (499-448 B.C.E.) reinforced Greek beliefs in their own military superiority. At the Battle of Marathon in 490 B.C.E., for example, some 10,000 Athenian and Plataean hoplites routed about 25,000 lightly armed Persian invaders. Even the Greek defeat at Thermopylae (480 B.C.E.), where 300 Spartiates held off perhaps 70,000 Persians for several days, represented in some sense a victory for the hoplite system. To the Greeks, Thermopylae showed that only treachery and vastly superior numbers could overwhelm free citizens fighting in a hoplite phalanx.

In the last half of the fifth century B.C.E. the hoplite way of war confronted several challenges. In particular, during the Greco-Persian Wars several city-states had developed fleets of oared galleys called triremes. Athens took the lead in naval warfare and by 450 B.C.E. had a skilled professional fleet numbering two hundred ships, the best and largest in the Greek world. Navies added strategic mobility to the military equation. No longer were battles confined to the borderlands between neighboring poleis. Fleets could now launch amphibious assaults hundreds of miles away from their home cities.

To take advantage of this mobility, a new type of soldier began to appear: the peltast. The original peltasts were Thracian mercenaries equipped with a small shield, or *peltē*, in Greek; later the term "peltast" denoted a wide variety of lightly armored foot soldiers equipped primarily with javelins. Peltasts fought in loose skirmishing formation. Although they could not confront a phalanx head-on, they were more mobile than heavily armored hoplites and so excelled at quick attacks in difficult terrain. Other light infantry, including slingers and archers, also became more common.

The long and agonizing Peloponnesian War (431-404 B.C.E.), fought between opposing coalitions led by Athens and Sparta, clearly demonstrated the effects of these military innovations. Near Pylos in 425 B.C.E., for instance, an amphibious assault by Athenian peltasts and other light infantry overwhelmed Spartiate hoplites stationed on the rocky island of Sphakteria. The next year, at Amphipolis in northern Greece, the Spartan general Brasidas used a surprise attack combining hoplites, peltasts, and cavalry to rout a superior Athenian force. In this period, battle lost its limited and ritual character, and fighting occurred instead in both summer and winter, in both rain and snow, at night, on mountains, and even inside cities. The growing importance of fleets and light troops, in sum, was bringing an end to the agrarian monopoly on organized violence.

The Peloponnesian War also spurred the growth of military professionalism. Commanders, once amateurs, became skilled tacticians through constant campaigning. Some states imitated Sparta by drilling units of picked troops—*epilektoi*, in Greek—to provide a trained corps for their phalanx militias. Along with growing professionalism, the economic devastation caused by the war prompted many men to seek employment outside Greece. By the end of the fifth century, tens of thousands had enlisted as mercenaries with the Persian army in Asia Minor. In fact, twelve thousand of these soldiers supported the Achaemenid prince Cyrus the Younger (c. 424-401 B.C.E.) during his abortive attempt to usurp the Persian throne (401 B.C.E.).

Although shaken, the hoplite system was not totally overthrown by the Peloponnesian War. Indeed, its best practitioners, the Spartans, took comfort in the fact that they had triumphed in the major phalanx clashes of the conflict. During the Corinthian War (395-386 B.C.E.), though, Spartan military confidence suffered when a Spartan unit was attacked and nearly destroyed near Corinth by Athenian troops under the general Iphicrates (c. 410-353 B.C.E.) Iphicrates is said to have trained his hoplites as peltasts, lightening their armor and lengthening their spears.

The real blow came in 371 B.C.E., when the Thebans defeated the Spartans in a pitched hoplite battle at Leuctra. The Theban commander, Epaminondas (c. 410-362 B.C.E.), took advantage of many of the military innovations of the preceding century. He deployed cavalry and light troops to screen his advance and protect his flanks and used his force of picked troops, the Sacred Band, to spearhead his hoplite assault. Epaminondas also drew up the left wing of his phalanx fifty men deep; the usual depth was eight men. The Thebans easily crushed the much thinner opposing Spartan wing. For the first time in centuries, a Spartan army had been defeated in hoplite battle; the era of Spartan invincibility was over.

Thus by the mid-fourth century B.C.E. the classical Greek way of war had undergone many modifications. Nonetheless, as long as the polis remained the characteristic Greek political organization, the hoplite phalanx of citizen militia persisted. Ultimately, a fourth military system evolved to challenge the phalanx. It arose not in the poleis, but in Macedon, a region of northern Greece long considered a backwater.

Philip II of Macedon (382-336 B.C.E.), father of Alexander the Great (356-323 B.C.E.), came to the throne in 359 B.C.E. He inherited a kingdom in crisis; Illyrian invaders had just smashed the Macedonian army, killing King Perdiccas III, Philip's brother. Macedon was large and populous but in danger of being dismembered by its neighbors. To save his monarchy, Philip reformed his army. He began by creating a new mass infantry force. These soldiers, peasants rather than middle-class agrarians, fought as a phalanx but wore significantly less armor than hoplites. They carried a long pike, the sarissa, rather than the hoplite spear. Philip also reorganized Macedon's aristocratic cavalry, equipping it with lances and training it for mounted charges. In battle, cavalry and infantry functioned as hammer and anvil. The sarissa phalanx, with its hedgehog of pikes, would pin the enemy in place until the cavalry could charge a flank or other vulnerable spot. Specialized troops, including archers, light cavalry, slingers, and spearmen, protected the army's flanks, screened infantry advances, and conducted reconnaissance before battles. Finally, Philip created a corps of engineers and a siege train, enabling the Macedonians to capture fortified cities.

The new Macedonian army, then, was a true combined arms force. Many of its elements had surfaced before in Greek warfare—Philip reputedly drew inspiration from both Iphicrates and Epaminondas—but they had never been fully developed. Only a large monarchy such as Macedon, not a traditional polis, could afford to maintain such an army. Philip himself added the final ingredient to the Macedonian way of war. A master diplomat, he combined intrigue and negotiation with swift military strikes. By 348 B.C.E., Macedon not only had recovered from crisis but also reigned supreme in northern Greece. Philip then moved gradually south, threatening the independence of the city-states. After much squabbling, Athens and its allies took the field against the Macedonians. The two sides met at Chaeronea in 338 B.C.E., the citizen

phalanx against Philip's new model army. First the Macedonian infantry pinned their hoplite opponents. Then Philip's cavalry, led by his eighteen-year-old son Alexander, charged through a gap in the line and fell on the Greek rear. The Greeks broke and ran. Only the Theban Sacred Band stood its ground and fought to the death. The day of the independent polis and its citizen militia hoplites was over; the ascendancy of Macedon's military system was just beginning.

Philip never lived to enjoy the fruits of his victories. He was assassinated in 336 B.C.E., bringing his son Alexander III, known as Alexander the Great, to the Macedonian throne. Within two years, Alexander would embark on a journey of world conquest that eventually took him to the banks of the Indus River. Alexander's conquests, though, owed at least part of their success to the professional combined arms approach created by Philip II. The Macedonian way of war would reign supreme in the eastern Mediterranean until the second century B.C.E., when the successors of Alexander confronted the legions of Republican Rome.

Weapons, Uniforms, and Armor

The earliest Mycenaean weapons, dating from the sixteenth century B.C.E., include long rapiers, daggers, large spearheads, and arrows of bronze, flint, or obsidian. Bows were of the simple, noncomposite type. Slings were certainly deployed in this period and in all following ones. Little evidence for armor exists, although small metal discs found in early graves at Mycenae may be the remnants of otherwise perishable leather or fabric armor. The famous boar's tusk helmet, known from Homer's *Iliad* as well as from Mycenaean art, was also in use during this period. Artistic representations show two kinds of large shield: an oblong "tower" shield and the more common "figure eight," both of animal hide with metal reinforcement. Neither type had handles. Instead the shield was suspended by a shoulder strap, so a warrior could easily throw it over his back to protect a retreat.

Both weapons and armor improved during the height of Mycenaean power. Sword redesign eliminated weak tangs and provided better hand guards. A new large spearhead, some 50 centimeters long, appeared by the fifteenth century B.C.E.; its ribbed blade ran straight into its socket for greater strength. Composite bows, a borrowing from Minoan Crete, also came into use. Bronze body armor made its debut in the late fifteenth century B.C.E. An example from Dendra, constructed of overlapping metal plates with greaves and a high neck, seems designed for chariot-borne use. A boar's tusk helmet accompanies the Dendra armor; at Knossos and elsewhere conical bronze helmets have appeared. Shields became less popular; the "figure eight" type especially became more a ritual than a military item.

Striking changes in weapons and armor accompanied the last years of Mycenaean power. Between 1250 and 1150 B.C.E., long thrusting swords gave way to new types, shorter and stouter, with strong hilts and flat, straight-edged blades. The so-called

Turning Points

1400-1200 B.C.E.	Mycenaean civilization flourishes, with a wealth of political, economic, and religious centers.
1200-1100 B.C.E.	Mycenaean order collapses during a period of upheaval.
1100-750 B.C.E.	In the period known as the Greek Dark Age, petty chieftains replace the Mycenaean kings.
c. 900 B.C.E.	Iron weapons become increasingly popular.
750-650 B.C.E.	Hoplite armor and tactics are developed.
499-448 B.C.E.	The Persian Wars are fought between Persia and the Greek city-states.
431-404 B.C.E.	The Peloponnesian Wars are fought between Athens and Sparta.
371 B.C.E.	Thebes defeats Sparta at Leuctra, ending Spartan supremacy in hoplite warfare.
338 B.C.E.	The Macedonian army of Philip II defeats Athens at Chaeronea.

THE PELOPONNESIAN WARS

Griffzungenschwert, most distinctive of these types, was mass-produced and widely distributed. Examples appear in central Europe, Cyprus, the Levant, and Egypt as well as in Greece. Spearheads became smaller and less ornate, and spears began to be equipped with end spikes. Late Mycenaean arrowheads were invariably bronze and joined with a tang instead of slotted into shafts, like earlier arrowheads. Art of the period shows soldiers wearing reinforced leather or fabric, rather than bronze armor. Contemporary helmets may also have been made of reinforced hide rather than metal. Small circular or elliptical shields with handgrips appear alongside this armor.

Dark Age weaponry made a major shift from bronze to iron. Lighter, tougher and sharper than bronze, iron came into widespread use during the eleventh century B.C.E. The late Mycenaean Griffzungenschwert sword, translated into iron, remained common in the early Dark Age, but in the ninth and eighth centuries, shorter, broader swords appeared. Spearheads, often with wide leaf blades, initially remained bronze but became iron by the tenth century B.C.E. Dark Age graves often included multiple spearheads but no swords, perhaps reflecting the long-range warfare in Homer. The paucity of early Dark Age arrowhead finds also reflects the Homeric disdain for archery. Only on Crete did long, tanged arrowheads remain relatively common. Extremely little evidence exists for early Dark Age metal armor, although there may have been perishable leather or fabric armor. Metal corselets reappeared in Greece around 800 B.C.E. Conical metal helmets, with transverse or fore-and-aft crests, resurfaced around the same time. Artistic representations reveal the presence of cavalry throughout the later Dark Age; little evidence exists for the continued battlefield use of chariots.

New types of arms and armor accompanied the development of the hoplite phalanx during the eighth century B.C.E. Hoplites took their name from the *hoplon*, a large, round shield of leather or bronze-

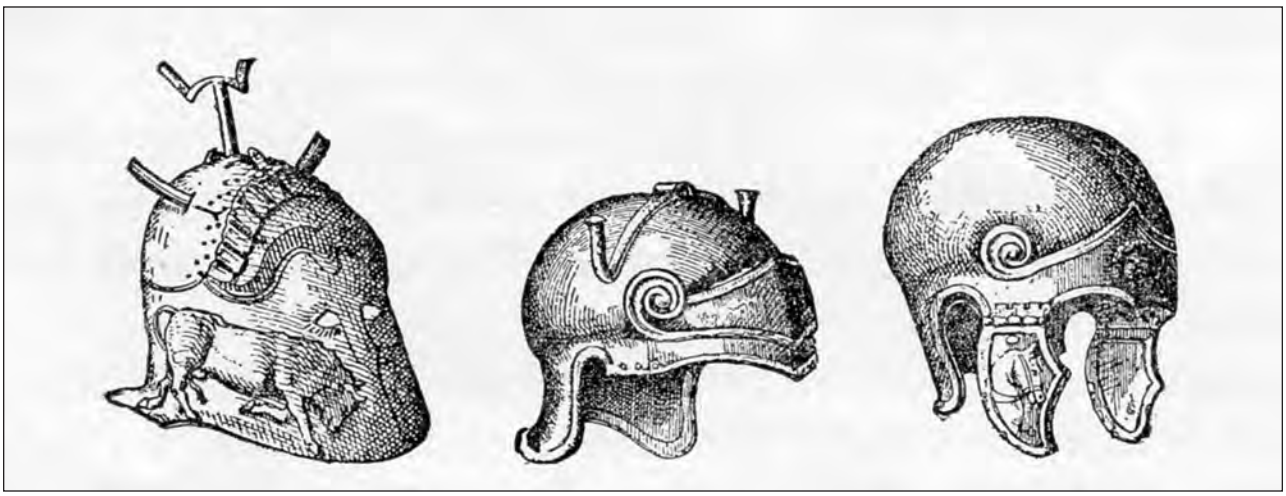
covered wood, some 3 feet in diameter. The hoplon boasted an armband, or *porpax,* as well as a handgrip, or *antilabē*, making it far easier to handle. Shields might have borne either a state emblem or individual insignia. Hoplite equipment also included a bronze helmet, greaves, and corselet. The most common helmet was the Corinthian, beaten from a single piece of metal and offering all-around protection at the expense of vision and hearing. The hoplite's main weapon, the spear, or *doru*, was roughly 6 feet long, with a bronze point and end spike. A variety of short swords served as secondary weapons. Among these was the single-edged *machaira*, a machete-like slashing blade. Over time the hoplite panoply got lighter. By the fifth century B.C.E., greaves were discarded, leather and fabric composite corselets often substituted for bronze, and metal helmets sometimes replaced with felt ones. Although Spartiates all wore red cloaks, no polis army had standardized equipment or a real uniform.

Peltasts wore little or no armor and carried light animal-hide shields. Often they attached a throwing-loop to their javelins for increased range. Greek archers generally used a short, weak bow to shoot bronze- or iron-tipped arrows. The recurved Scythian type arrow was known but not widely used. Slingers, their weapons made of gut or sinew, often outranged archers. They used stones or almond-shaped lead bullets as ammunition. Classical Greek cavalry was weak and suited mostly for pursuit. Horsemen carried javelins and wore light armor; they had no stirrups.

In the fourth century B.C.E., Macedonian phalangites usually wore only light fabric or leather armor. Their pike, or sarissa, required both hands, so they carried a small light shield on a neck strap. Like the hoplite spear, the sarissa had a bronze tip and end spike. Both cavalry and infantry versions of the sarissa existed; the infantry version was 12 to 15 feet long, and the cavalry type relatively shorter. As shock troops, Macedonian cavalry often wore metal armor. They were expert lancers even without the aid of stirrups.

MILITARY ORGANIZATION

Virtually nothing is known about Mycenaean military organization. Linear B tablets from Pylos suggest an army divided into ten units with attached officers. The tablets also mention an official called the *lawagetas* ("people-leader"), who might have been the kingdom's wartime commander. Dark Age military structure remains similarly obscure. Chieftains together with clansmen and retainers probably fought as loose warrior bands.



F. R. Niglutsch

Some Athenian helmets.

In the hoplite era, each polis had its own military structure, usually reflecting its civic organization. At Athens, for example, the phalanx was divided into ten tribal regiments or *phylai* (singular *phylē*), also called *taxeis* (singular *taxis*). The phylē or taxis was not a tactical unit, and it varied in strength according to the number of men called up for any given campaign. Athens's cavalry was also divided into ten tribal regiments. The early Athenian army was commanded by its *polemarchos*, or war leader; later a board of ten elected generals (*stratēgoi*, singular *stratēgos*) took over.

The Spartan phalanx possessed a defined tactical organization, but its details remain disputed. According to Thucydides, it consisted of seven *lochoi* (singular *lochos*), each divided into four *pentēkostyes* (singular *pentēkostys*) of 128 men apiece. The pentēkostys in turn comprised four *enoomotiai* (singular *enoomotia*) of 32 men apiece. Xenophon in contrast describes an army of six *morai* (singular *mora*), each containing four lochoi of 128 men. These lochoi mustered only two pentēkostyes of two enoomotiai apiece. Thucydides and Xenophon agree that each subunit had its own regular officers. The army as a whole was commanded by Sparta's two kings.

During the fifth and fourth centuries B.C.E., a number of states experimented with units of picked troops, or *epilektoi*. Their size varied; the most famous of these elite units, the Theban Sacred Band, comprising 150 pairs of homosexual lovers, was maintained at state expense. Greek mercenaries in Asia Minor, perhaps following Persian military principles, were regularly organized into lochoi of one hundred men each. These lochoi were independent tactical and administrative units, with regular officers, called *lochagoi* (singular *lochagos*).

The basic unit of the Macedonian phalanx was the *syntagma* of 256 men, comprising 16 files of 16 men apiece. Macedonian syntagmata were maneuverable tactical units, with regular officers. Cavalry was organized into squadrons of two hundred horsemen called *ilai* (singular *ilē*). Units of elite infantry and cavalry functioned as vanguards in battle. Macedonian kings bestowed the coveted status of "Companions" (*hetairoi*) on both horse and foot soldiers in order to reward and encourage valor.

DOCTRINE, STRATEGY, AND TACTICS

Nothing certain can be said of Mycenaean or Dark Age military doctrine. The essential doctrine of the hoplite system, however, is clear: to engage in decisive phalanx battle. This principle undergirded Greek warfare from the rise of the polis on through the fourth century B.C.E. Its rationale was as much political as military: Short, decisive clashes kept war limited and allowed farmers to devote maximum time to agriculture. As long as hoplite warfare depended on mutual agreement to fight, moreover, strategy was not an issue.

The Peloponnesian War did see the development of Greek strategy. Athens, a sea power, sought to avoid hoplite battle by relying on its navy. Sparta, supreme on land, undertook annual invasions of Athenian territory in a fruitless attempt to lure the Athenian phalanx out to battle. These disparate strategies ensured that although neither side lost, neither side won a clear victory. Attempts in the middle years of the war by both belligerents to break the deadlock failed. Although each side had minor successes in the other's territory, neither side could win the war unless it beat the other at its own game. Ultimately the Spartans did exactly this. They deployed their own fleet, defeated Athens at sea, and blocked the city's grain imports. The Athenians could have prevented this outcome, but they overconfidently squandered much of their naval strength in a failed attempt to capture the island of Sicily.

As with strategy, there was not much to traditional hoplite tactics. Commanders were aware that advancing phalanxes tended to drift to the right, each man trying to get behind the shield of the man next to him, and they sometimes took measures to forestall this. The Spartans, with their intricate tactical organization, were able to maneuver effectively on the battlefield. This ability won them the day on several occasions. Otherwise, the main tactic of phalanx battle, even for the Spartans, was head-on collision. The development of light troops in the late fifth century B.C.E. gave impetus to flanking movements and surprise attacks. Using hit-and-run tactics, peltasts, slingers, and spearmen could discomfit the traditional phalanx. Greek armies, though, still relied on

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Use of the Macedonian phalanx during the Battle of the Carts (mid-fourth century B.C.E.).

hoplites to strike the decisive blow. Two strategies for increasing the strength of this blow were a deeper phalanx—the tactic of Epaminondas at Leuktra—and the use of picked troops.

On the battlefield, the combined arms tactics of the Macedonians gave them a decisive edge over even the best Greek troops. Perhaps more important, though, was Macedon's consistent strategy. From his accession, Philip proceeded methodically first to stabilize his kingdom, then to subjugate its neighbors, and finally to consolidate power over all Greece. Unlike the Greeks, the Macedonians were not tied to the doctrine of decisive battle. Indeed, Philip achieved some of his major victories through diplomacy and political intrigue.

The Macedonians also made logistics a keystone of strategy. The hoplite system gave little consideration to the requirements of extended campaigning. Traditional phalanx clashes, after all, occurred close to home. Furthermore, classical hoplites went to battle followed by slave servants bearing rations and equipment. When hoplites deployed far afield, as in the Peloponnesian War, they could usually depend on a fleet to carry supplies. The Macedonians, on the other hand, learned to conduct extended land campaigns without naval supply. Philip eliminated slave porters and made his troops travel light. He successfully employed coercion to ensure that food supplies would be ready and waiting when his troops entered new territory. Just as he trained Alexander's army, Philip developed the logistical and strategic thought that made feasible his son's conquests.

ANCIENT SOURCES

For all periods of Greek warfare from 1600 to 336 B.C.E., archaeological excavation provides the basic evidence for Greek arms and armor. A. M. Snodgrass, in *Arms and Armor of the Greeks* (1999), collects this evidence in a format accessible to nonspecialists. For the late Bronze Age, excavated Linear B tablets from Mycenae, Pylos, and elsewhere furnish information about the military organization and equipment of the Mycenaean kingdoms.

The *Iliad* (c. 750 B.C.E.; English translation, 1611) and *Odyssey* (c. 725 B.C.E.; English translation, 1614), epic poems ascribed to Homer, are among the earliest literary sources for information about Greek warfare. Scholars continue to debate the veracity of Homeric descriptions of warfare; most would agree that the poems reflect the battle conditions of the Greek Dark Age rather than those of the Mycenaean period.

In his *Historiai Herodotou* (c. 424 B.C.E.; *The History*, 1709), Herodotus (c. 484-424) recounts the major land and naval battles of the Persian Wars. Likewise, Thucydides (c. 459-402 B.C.E.) narrates the course of the long and agonizing Peloponnesian Wars. Both Herodotus and Thucydides provide useful information on Greek strategies, tactics, and military organization during the fifth century B.C.E.

The works of the Athenian author Xenophon (431-354 B.C.E.) are essential for any understanding of Greek warfare. In addition to a memoir of his experiences as a mercenary commander during 401-399, *Kurou anabasis* (*Anabasis*, 1623; also known as *Expedition of Cyrus* and *March Up Country*), Xenophon composed a history of Greece, *Ellīnika*, also known as *Helenica* (*History of the Affairs of Greece*, 1685), and technical treatises on the cavalry, horsemanship, and hunting. His *Lakedaimoniōn politeia* (*Polity of the Lacedaemonians*, 1832; also known as *Constitution of Sparta*) describes Spartan army organization and training in the fourth century B.C.E.

Finally, the Roman magistrate and writer known as Arrian (c. 89-155 C.E.), produced several texts that furnish important evidence for the organization, equipment, and tactics of the Macedonian army. These texts include a history of the campaigns of Alexander as well as a tactical manual.

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John W. I. Lee

Greek and Hellenistic Warfare from Alexander to Rome

Dates: 336-30 B.C.E.

Political Considerations

In the early fourth century B.C.E., Greece did not exist as a unified nation but as a number of separate, often hostile, city-states struggling among themselves for power. Although the major cities of Sparta, Thebes, and Athens had warred against each other for control of the Hellenic peninsula, none had been able to establish permanent dominance. Despite their mutual antagonism, all of these separate political entities still identified themselves as "Greek," based on their shared history, traditions, and customs. To the ancient Greeks, other cultures or nationalities were, of necessity, barbarian and inferior. This categorization extended not only to the Celts, the Gauls, other aggressive tribes to the north, and radically different cultures to the east but also to other kingdoms, such as Macedonia, that shared much of their culture with Greece. It is ironic, therefore, that the greatest Greek empire of all time arose from the marginally barbarian region of Macedonia.

Claiming Greek status through alleged descent from the legendary Greek hero Heracles, Philip II of Macedonia began his rise to dominance in 352 B.C.E. and by 348 B.C.E. ruled all of Greece north of Thermopylae. Using a combination of wealth and political savvy backed by military strength, Philip eventually defeated the combined armies of the Greeks at Chaeronea in 338 B.C.E., ending the era of the independent Greek city-state. Despite his victory and his obvious leadership qualities, Philip was never entirely accepted as an authentic Greek. In an attempt to win favor with Athenians and other Greek elites, he announced an invasion of Persia to liberate the Greek cities seized by the Persians during the previous century. Philip's plans were cut short by his assassination in 336 B.C.E. Philip's son, Alexander, only twenty-two years old when he assumed the Macedonian throne, inherited his father's army, his uneasy relationship with the Greeks, and his dreams of empire.

Military Achievement

Military empires never last forever. Like human beings, empires come into being, grow, mature, falter, and eventually perish. In little more than a decade, from 332 to 323 B.C.E., the empire of Alexander the Great of Macedonia grew to encompass most of the known world. After Alexander's death this vast empire splintered, fracturing into smaller kingdoms that struggled for power among themselves, eventually to be defeated one after another by the legions of the expanding Roman Empire.

Inspired by the idealized heroes of Homer's epic poems, Alexander utilized both strategy and charismatic personal leadership to effect an unbroken string of major victories. The Battle of the Granicus River in 334 B.C.E., fought near the ancient ruins of Troy, was the first of three major battles between Alexander the Great and the Persian Empire. After Alexander defeated the Persians and a large force of Greek mercenaries led by Memnon of Rhodes, city after city opened to him. In 333 B.C.E., Alexander's army and the Persian forces of Darius met at Issus, in what is now coastal Turkey. The Persians' left wing collapsed under an assault from Alexander's cavalry, the Persian line was flanked, and the Persian emperor, Darius the Great, fled.

After being crowned Pharaoh in Egypt, Alexander returned to the Persian campaign. In 331 B.C.E., Darius positioned his scythed chariots on flat ground near Gaugamela. As the Macedonians seized reins

and slew horses and charioteers, Darius was pushed off the edge of the plain onto uneven ground. Darius fled again, only to be assassinated by one of his own couriers. In the succeeding three years, Alexander's army completed the conquest of the Iranian plateau. By 326 B.C.E., Alexander had reached the Hydaspes River in Punjab, India, where he defeated Porus and his war elephants in battle. Porus surrendered and pledged allegiance to Alexander.

If not the greatest military commander in the ancient world, Alexander was one of the best. He was the son of one of the great military leaders of the ancient world and the pupil of Aristotle, one of the greatest philosophers and teachers of the ancient world. He inherited a great army and made it greater. Under his leadership, his armies conquered Persia, Anatolia, Syria, Phoenicia, Judea, Gaza, Egypt, Bactria, and Mesopotamia. Toward the end of his short life, he pushed the boundaries of his empire as far as India.

As in any extended empire, however, vastness worked against him. As Alexander acquired new territories, his men remained farther from home with every march and with every victorious battle. Hence, although Alexander wanted to continue eastward to the Great Outer Sea and the very ends of the earth, he was forced to turn back. After surviving twelve years of battle, Alexander the Great died in bed at his palace in Babylon in June, 323 B.C.E., either as a result of being poisoned or from disease. When asked on his deathbed to whom his empire should be given, he has famously been quoted as saying, "To the strongest."

After his death, his empire was ripped apart by various factions attempting to be the strongest. In creating his own great empire, Alexander had destroyed the older, more stable empire of the Achaemenids, creating a vacuum of power ultimately to be filled by new rival kingdoms, all founded by members of Alexander's inner circle of commanders, the Diadochi. These successors murdered Alexander's son, broke pacts, and allowed a weakened Macedonia to be attacked by tribes of Gauls from the north. Antigonus I Monophthalmos and his descendants dominated the old kingdom of Macedon, and most of the old Greek city-states, until they were defeated at the Battle of Pydna in 168 B.C.E. The Attalid kingdom that ruled Pergamon ceded it to the Roman Republic in 133 to avoid a war of succession. The last remnants of the Seleucid Empire, formerly encompassing Babylonia and the eastern part of Alexander's empire, were absorbed by Rome in 63 B.C.E. After Ptolemy and his descendants were accepted as successors to the ancient Pharaohs, their empire was finally conquered by Octavian (later Augustus) in 30 B.C.E. The reign of the last of the Hellenistic empires ended, and with it died Alexander's dreams of a pan-Hellenistic world.

Like the lingering aftershocks after a major earthquake, the empires of Alexander's successors could never rival the original. Yet the fact that they persisted for nearly three centuries, from 336 to 30 B.C.E., is a testament to the legacy of this great military commander and to the Hellenistic way of war.

Weapons, Uniforms, and Armor

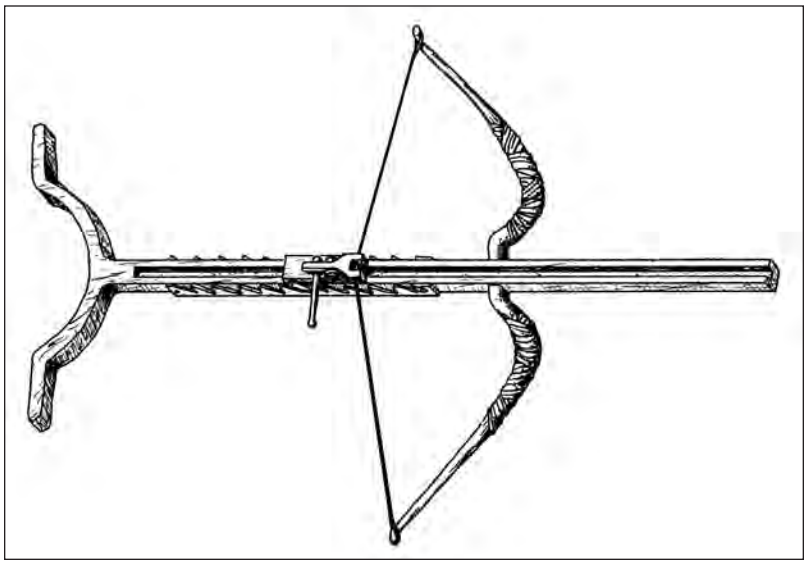
Although the ascendance of the Macedonian forces, especially under Alexander, was based on decisive generalship and intelligent use of cavalry, the emblematic weapon of the Macedonian infantry was the *sarissa*, a weighted and double-pointed, iron-tipped pike more than eighteen feet in length. Jutting forward from the Macedonian phalanx, the weapons of the first five rows of men all projected beyond the leading edge of the formation. With five spear points bristling in front of each phalangite, the massed sarissa could be a formidable offensive weapon, particularly if the entire phalanx advanced down an

Turning Points

399 B.C.E.	Dionysius I of Syracuse sponsors catapult research.
338 B.C.E.	Philip II of Macedon defeats united Greek army at Chaeronea.
333 B.C.E.	Alexander defeats main army of Darius III at Issus.
332 B.C.E.	Alexander the Great begins Siege of Tyre.
331 B.C.E.	Alexander defeats main army of Darius III at Gaugamela.
197 B.C.E.	Romans defeat main army of Philip V at Cynoscephalae.

Classical Greece, Fifth Century B.C.E.

incline, lending momentum to the push, or charge. Defensively, the *saurotēr*, the counterweighted spike at the rear, could be planted in the ground to fend off an attack. Since phalangist troops used both hands to wield the heavy sarissa, they bore shields on their left arms on straps or harnesses. In close formation, each shield protected the man to the left, an arrangement covering most of the phalanx in a "shield wall" but leaving the extreme right open to a flanking attack. If the phalanx became scattered, the secondary weapon was a short sword.



Kimberly L. Dawson Kurnizki

The gastraphetes*, or belly bow, developed by the Greeks around 400 B.C.E., was a significant advance in catapult technology. The operator would lean forward with his abdomen, pinning the weapon against the ground to force a slide backward.*

Later Hellenistic infantry of the period used the *doru*, a shorter spear; curved short swords distinguished as the *kopis* and the *machaira*, depending on the direction of curve; and the *xiphos*, a double-edged sword. Defensive equipment included metallic or nonmetallic breastplates, leather shields covered in thin metal sheathing, and greaves to protect the lower legs. Helmets ranged from simple metal Boeotian hatlike helmets to complex Thracian models with cheek and nose protectors.

During this era, innovation in military technology was expressed in the development of siege engines. Building from the concept of the *oxybelēs*, a simple fixed bow, Greek and Hellenistic engineers developed advanced catapults using twisted sinews to increase power and range. Some of these machines were capable of launching 250-pound projectiles. Other innovations included the use of naphtha, or "flaming mud," and a solar-powered heat ray reportedly invented by Archimedes on behalf of the Syracusans in 212 B.C.E.

What was not invented could be borrowed. After capturing eighty battle elephants from King Porus at the Battle of the Hydaspes River, Alexander acquired one hundred more before returning to the west. Alexander's Hellenistic successors made elephants the fad weapon of the era. Able to frighten horses and terrify men, trample infantry and cavalry alike, and even demolish wooden fortifications, elephants could charge at fifteen miles per hour. At that speed, however, they were hard to stop, and they often tended to run amok, trampling friend and foe alike.

A more successful borrowing was the cataphract, a rider and steed covered completely in chain mail or scale armor. Human cataphract armor could contain as many as fifteen hundred scales and might weigh nearly ninety pounds, while the horse armor usually consisted of large aprons of scales tied around the animal's body. Originating in ancient Iran, the cataphract was widely adopted by the Hellenistic Seleucid Empire in Persia and by the Parthians, who used it victoriously against Roman forces in 53 B.C.E., with the defeat of Marcus Licinius Crassus at the Battle of Carrhae.

MILITARY ORGANIZATION

Although Greece is revered as the cradle of democracy, Alexander the Great was the undisputed ruler of the Macedonian Empire and its army. Parmenio and a

few other well-regarded generals were Alexander's close advisers. Under this level were commanders, the selection of whom was based on personal relations, familial ties, and political status. Because conveying orders during battle could be difficult, instructions were given to subordinates during frequent prebattle general staff meetings, so these commanders met personally with Alexander on a regular basis.

To reinforce emotional cohesion within fighting units, men were grouped according to geographic origin. Even officers were usually selected from the same districts as the common soldiers. In addition, a hierarchy of relative positions of honor encouraged bravery and prowess in battle. The most prestigious unit was the *hetairoi*—the companions. Organized into regional squadrons made up of two hundred to three hundred soldiers and led by Alexander himself, the companion cavalry had originated in the horsemen of the Macedonian nobility, but membership later became based on skill, or *techne*, and character, *aretē*. This premier cavalry unit was always placed to the right of the line of battle, the place of highest honor in the Macedonian array. The Thessalian heavy cavalry, serving Alexander because he was *tagos*, or military leader, of Thessalia as well, deployed on the left flank.

Immediately to the left of the hetairoi were the noble-born royal guard. They were followed by the elite *hypaspistai*, or shield bearers, three subunits of one thousand foot soldiers each, made up of the best fighters selected from all the regiments. Then came six or seven battalions of foot soldiers, or *pezhetairoi*, each with perhaps fifteen hundred men. The order of the battalions was based on their past fighting performance. Place in line and even within cavalry, or *hipparchy*, lines reflected ranks of honor, spurring each man and each unit to outperform their fellow warriors.

The army of Alexander also included native Macedonian light infantrymen, ranking generally above mercenaries and consisting of javelineers, archers, and slingers. Macedonian control over the gold and silver mines of northern Greece provided the pay for thousands of additional mercenaries from various nations, so Thracians were hired as *peltastai*, or shield-bearing skirmishers, archers were recruited from Crete, and spearmen were hired from Phrygia. These mixed troops provided added strength and flexibility throughout Alexander's conquests. Greek mercenaries were also used in the Macedonian expeditionary army, although these forces were mostly employed for garrison duty in the conquered provinces.

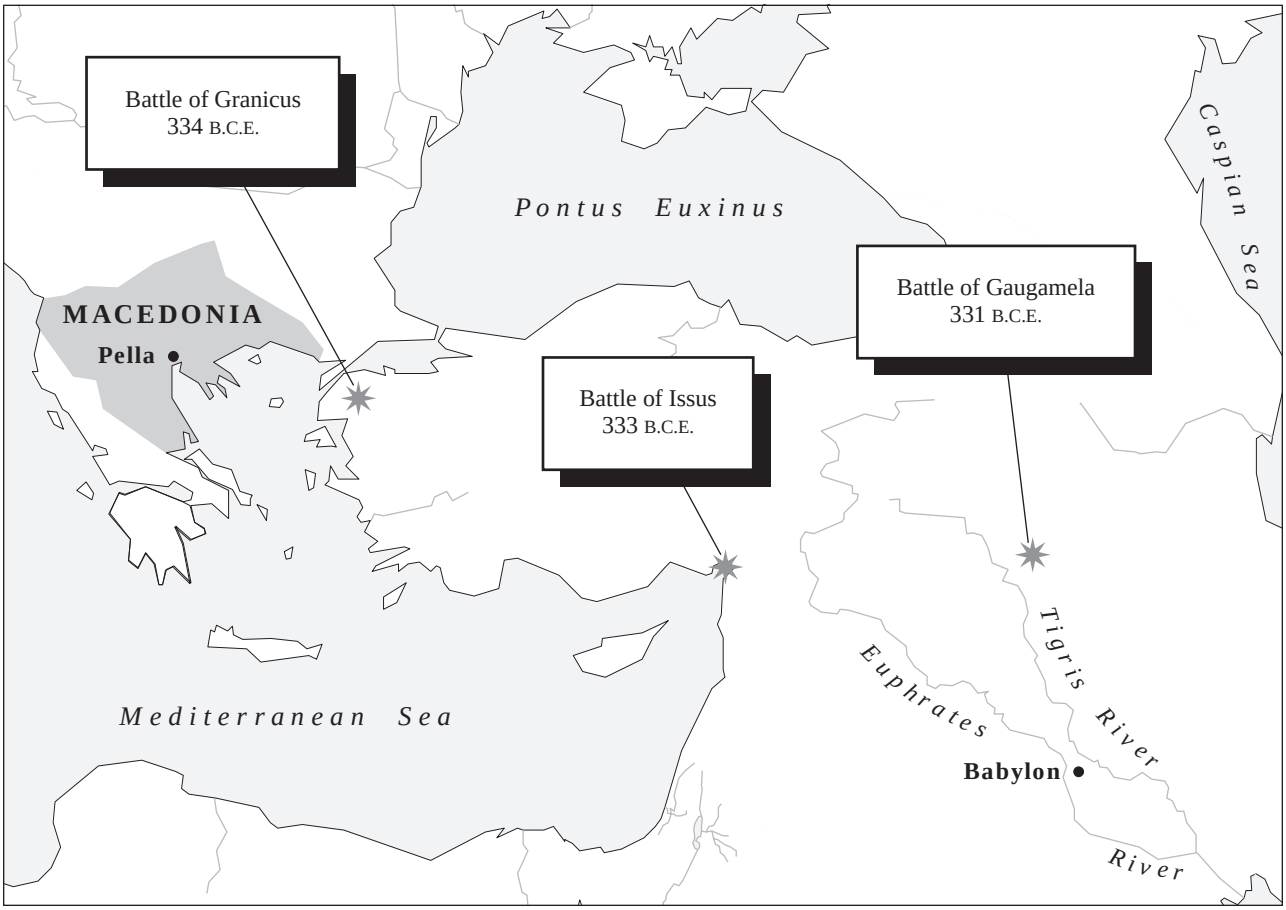
Later Hellenistic warlords often named individual units according to the colors of their shields to encourage unit pride and solidarity. For example, until after the Battle of Pydna in 168 B.C.E., when the Antigonid kingdom was crushed by Rome, units within the phalanx of the Antigonid armies had been designated as *Chalkaspides*, or bronze shields, and *Leukaspides*, or white shields.

DOCTRINE, STRATEGY, AND TACTICS

Iphicrates, a Greek general in the early fourth century B.C.E., likened the army to a human body, with light armored troops as its hands, the cavalry as its feet, the phalanx as its chest, and the general as its head. This organic integration is evident in the later armies of the Alexandrian and Hellenistic empires. Preferring professional troops over the part-time warriors of antiquity, Alexander the Great polished the skills of his men and units to perfection. He then developed an early form of combined-arms warfare in which each specialized unit could function as part of a synchronized whole. Alexander continued to use the modified Macedonian phalanx but combined its use with decisive cavalry attacks, subterfuge, intimidation of the enemy, swift retaliation against traitors, and the adoption of the new military technology of siegecraft.

Alexander's battle tactics were planned to force the enemy into hurried and perhaps rash countermoves. His attacks generally consisted of a bold advanced right flank and a refused center made up of battalions of phalangites, with their long, staggered arrays of spear points pinning down the enemy infantry. Meanwhile, a fierce assault by the heavy horse companions, usually led by Alexander in person, would engage an extreme flank of the opposing forces, folding them back against the center in an ac-

Alexander's Campaign Against Persia, 334-331 B.C.E.

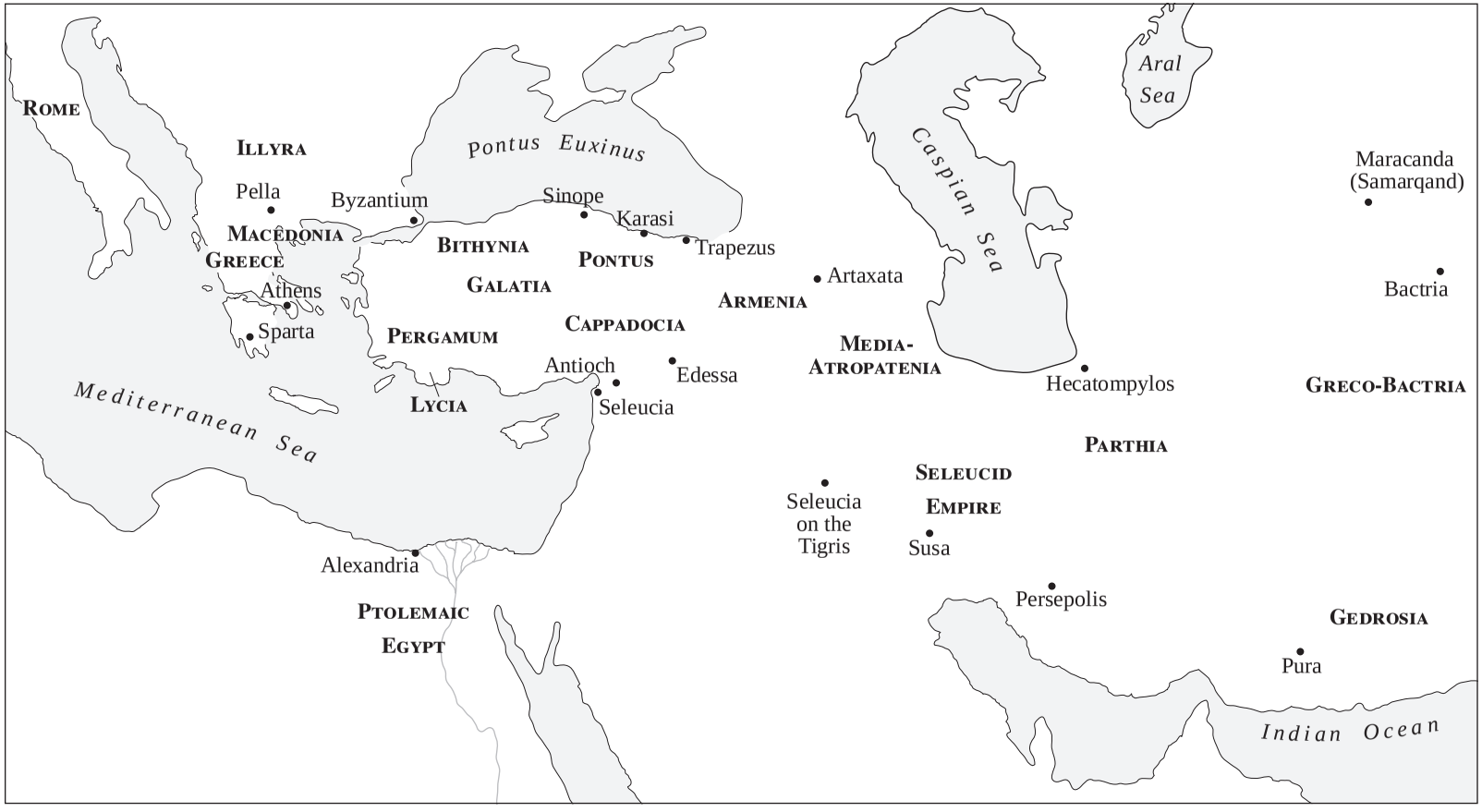


tion likened to a hammer hitting an anvil. The intensity of this initial charge was intended to break the spirit of the enemy. Victory often depended in large part on undermining the morale of an opponent, and toward this end, Alexander often employed unexpected maneuvers to surprise opposing forces. Generally ignoring the idea that favorable terrain was necessary to ensure victory, Alexander often chose apparently unsuitable ground from which to attack, a deceptive tactic intended to keep the enemy off balance. Another common tactic he used was to engage the enemy when his troops were fatigued by long marches or lack of reinforcements.

The Greek concept of *metis*, cunning intelligence or deception, was traditionally controversial in warfare, as it seemed to conflict with the ideal of forthright, noble battle. However, the ancient Greeks of Homer's epics had utilized it, and Alexander had no scruples in using deception, feints, and intelligence-gathering activities whenever possible. The Alexandrian and Hellenic armies often moved troops by night or behind lines of battle. Feints were used to divert the enemy's attention, and false information could be provided to known spies.

Alexander rarely used his elite cavalry directly against infantry, sometimes skirmishing along the flanks of the enemy to buy time while his infantry moved into position, as he did at the battle against the Malli. The Macedonian phalanx itself, usually sixteen men deep, could be transformed into a hammerhead formation of fifty or more ranks or unfolded into a wider and shallower line of battle.

The Hellenistic World, 185 B.C.E.



When facing elephants in battle for the first time at the Battle of the Hydaspes River, Alexander divided his force into two units. The first boxed in the enemy's cavalry, forcing them into close quarters with their own elephants. When the Macedonian archers focused their fire on the elephants, the enormous creatures ran amok, trampling the Indian cavalry. After the elephants were finally exhausted, Alexander ordered his phalanx to advance in tight formation. Any enemy troops fleeing this advance ran into the remainder of Alexander's army, commanded by General Craterus. This maneuver destroyed two-thirds of the Indian army.

Alexander also besieged fortified cities, as he did in 332 B.C.E., at the coastal city of Tyre. Having constructed a mole, an armored dock allowing siege engines to attack from a sea or river, the Macedonians poured into the city over bridges from siege towers based on the mole. They were met by tridents, nets, superheated sand, flaming missiles, and crows—giant fishing poles with hooks large enough to catch soldiers trying to scale walls. Eventually a two-pronged attack succeeded: Alexander led an assault to the seaward base of the city wall, while another contingent of Macedonians breached the wall and charged into the city. At the end of the seven-month siege, approximately seven thousand Tyrian men had been killed in battle. Another two thousand were hanged after the battle, and all of the city's women and children were sold into slavery. In the later Hellenistic period larger, more complicated siege engines were invented, and yet most sieges were broken in traditional ways, through reliance on human attacks, surprise, and the use of traitors rather than sustained mechanical assaults.

Use of the Macedonian-style phalanx persisted into the Hellenistic wars against Rome, but failure to defend exposed flanks (as at the Battle of Cynoscephalae) and rash decisions leading to breaks in formation (as at Pydna) allowed the Roman troops to prevail at critical points in history. While the phalanx remained on battlefields throughout the Hellenistic period, wars had evolved into more complex operations, involving naval combat and siegecraft, cataphracts and elephant corps. Eventually, the limited availability of Greek conscripts in the east led to dependence on untrustworthy mercenary forces, while western Hellenistic armies were continuously weakened by internecine or barbarian wars. Local manpower and generalship decreased, paving the way for Roman supremacy.

That being said, the Romans were excellent absorbers of the best of other cultures. They adopted many elements of the Greek and Hellenistic world, ensuring that the techniques and tactics of the Alexandrian and Hellenistic armies would survive, at least in part, within the legions of the Roman Empire.

ANCIENT SOURCES

Because no one can go back in time to witness historic events, scholars of history in the present must rely on accounts recorded by eyewitnesses of the original events. Lacking such accounts, any sources originating close to the time of the events in question become the next best thing. Most contemporary accounts from the time of Alexander the Great have been lost. Only a handful of original fragments and the works of later, but still ancient, writers who based their histories on primary sources still exist.

Among the best ancient sources on Alexander are Plutarch's *Life of Alexander* from his series *Bioi paralleloi* (c. 105-115; *Parallel Lives*, 1579) and works by Arrian (c. 89-155 C.E.), including the *Anabasis Alexandri* (early second century C.E.; *The Campaigns of Alexander*, 1893). Although he wrote nearly four centuries after Alexander's death, Arrian is an important historian because he based his work on the writings of several of Alexander's contemporaries, including Ptolemy, Callisthenes, and Aristobulus—works now all lost to time. Arrian's writings also contain the most complete account of military rather than biographical aspects of Alexander, in contrast to Roman historian Quintus Curtius Rufus, who wrote his ten-volume biog-

raphy of Alexander the Great in the mid-first century C.E. Of those original ten books, eight still exist in at least partial form, but Curtius Rufus focused his work on Alexander's character rather than on solid factual detail.

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Helen M. York

Carthaginian Warfare

Dates: 814-202 B.C.E.

Military Achievement

Carthage, a historic city on the north coast of Africa, traditionally was founded in 814 B.C.E. by Phoenicians. Historically, the military achievements of Carthage, a maritime trading power, have been measured by its naval and land conflicts with Rome, the emerging power on land. This deadly hegemonic contest, however, was not the only formal measure of Carthage's military achievements. Long before its fateful clashes with Rome in the Punic Wars (264-146 B.C.E.), Carthage had made its military presence forcefully known throughout the western Mediterranean, Southern European, North African, and West African regions from the eighth to the third centuries B.C.E. This strategic presence was based on a powerful professional navy with a significant troop-transport capacity that sustained land forces that protected Carthage's home and overseas territories, important trade routes, and wide-ranging commercial fleets. Carthage's strategic ability to move significant military forces throughout the western Mediterranean region would, for a period of time, deter Rome both politically and militarily from challenging Punic control of Sardinia and Sicily.

The land and naval expeditionary forces of Carthage ranged widely in the Atlantic and the Mediterranean, resulting in the occupation of Corsica, Spain, Sardinia, Sicily, and territories of North Africa. This first phase of Carthage's expansionism (264-237 B.C.E.) was characterized by a strict civilian control by the Council of Elders of senior army and navy commanders and their mercenary troops. During this period of civilian supremacy over political and military policy, Punic generals and admirals who were successful in battle were rewarded, and those who were not were either exiled or killed.

During the twenty-three years of the First Punic War, Rome had 400,000 casualties. At the same time, Carthage suffered major defeats in the Battles of Mylae (260 B.C.E.), Ecnomus (256 B.C.E.), Adys (256 B.C.E.), and Panormus (250 B.C.E.). Carthage won a major battle at Tunis in 255 B.C.E., led by the Spartan general Xanthippus, who defeated the Roman consul Regulus and forced the latter's retreat from Africa. At the Battle of Drepana (249 B.C.E.), the Punic naval commanders Adherbal, Carthalo, and Himilico defeated a large Roman fleet under admiral Claudius toward the end of the First Punic War. Despite this victory, Carthage's surrender at the Aegates Islands (241 B.C.E.) ended the First Punic War. The defeat resulted in a severe loss of Carthaginian territory, including Sicily, Corsica, and Sardinia. Carthage also suffered large reparations, a vastly reduced battle fleet, and a weakened land army.

Rome, a weaker naval power, owed much of its success in the First Punic War to its acquisition of a new naval technology: the *corvus*, a nautical grappling hook. This device was simply a long, spiked gangplank mounted on the bow of a Roman warship and dropped onto the deck of a Carthaginian ship, securing the two ships together and allowing a Roman contingent to board and capture the opposing vessel. The corvus effectively ended Carthage's naval supremacy and had a long-term negative impact on Carthage's national security and overseas military operations.

The second phase of Carthaginian expansionism occurred from 237 to 202 B.C.E. The military achievements and the very survival of the Carthaginian Empire during this time rested on the strategic leadership and tactical genius of its talented military commanders, the Barcid family. The commanders—Hamilcar Barca (c. 270-228 B.C.E.), Hannibal (247-182 B.C.E.), Mago (died c. 203 B.C.E.), Hasdrubal (died 221 B.C.E.), Hanno (fl. third century B.C.E.), and Maharbal (fl. c. 216 B.C.E.)—would train the physically tough and hard-fighting indigenous and mercenary troops

through the force of their personalities, charisma, and personal courage. This period also signaled the masterly control of the political and military policies of Carthage by these strong-willed and militarily gifted generals.

In 247 B.C.E. the Council of Elders' appointment of Hamilcar Barca as the military commander of Sicily began a dynamic new phase in the military history of Carthage. After the end of the disastrous First Punic War, the Barcid clan began to question the competency of the mercantilist faction of the Council of Elders to conduct political policy and wage war against Rome. This fierce internal struggle within the Council of Elders between the mercantilist faction and the Barcid clan and among other Punic interest groups would have long-term consequences.

The end of the First Punic War found Carthage without sufficient bullion to pay its mercenary army adequately, which revolted and attacked Carthage and its surrounding provinces. Hamilcar Barca was appointed by the Council of Elders to put down the revolt and moved quickly to defeat the rebellious mercenary forces. In the summer of 237 B.C.E., Hamilcar and his sons Hannibal, Mago, and Hasdrubal landed in Spain. After eight years of military campaigning, Hannibal subjugated important Spanish territories in preparation for the coming military conflict with Rome. He was the first in a dedicated group of highly trained and dedicated Punic military commanders who would practice strategic endurance, exercise tactical brilliance, and exert complete control over Carthage's political policy in the grand military conflict with Rome. In the winter of 229-228 B.C.E. Hamilcar died and his son-in-law Hasdrubal took over in Spain. After Hasdrubal was assassinated in 221 B.C.E., Hannibal came to power in Spain and in Carthage and strengthened the Punic army of 50,000 foot soldiers, 6,000 cavalry, and 200 battle elephants. In 218 B.C.E. Rome declared war against Carthage in response to Hannibal's defeat of Rome's ally in Spain, the city-state Sarguntum.

In late 218 B.C.E., Hannibal descended victoriously into Italy's Po River Valley with 20,000 soldiers and 6,000 cavalry. He had designed a major trap for the two Roman generals Scipio Africanus (236-184 or 183 B.C.E.) and Tiberius Sempronius Longus, who were meeting at Scipio's camp near Trebia, and routed the Roman forces. In June, 217 B.C.E., Hannibal designed another large ambush at Lake Trasimeno and killed 20,000 soldiers in the army of Gaius Flaminius. In August, 216 B.C.E., the co-consuls Lucius Aemilius Paulus (died 216 B.C.E.) and Gaius Terentius Varro (fl. c. 216 B.C.E.) arrived at Cannae with more than 87,200 soldiers. Hannibal's army of 50,000 men was prepared for battle. With losses of 47,000 infantry and 2,700 cavalry, and with 19,000 prisoners, the Roman army was decimated in what became known as the first battle of annihilation in history.

However, the military achievements of Hannibal and Carthage came to a final end with his military defeat by Scipio Africanus at the Battle of Zama in 202 B.C.E.

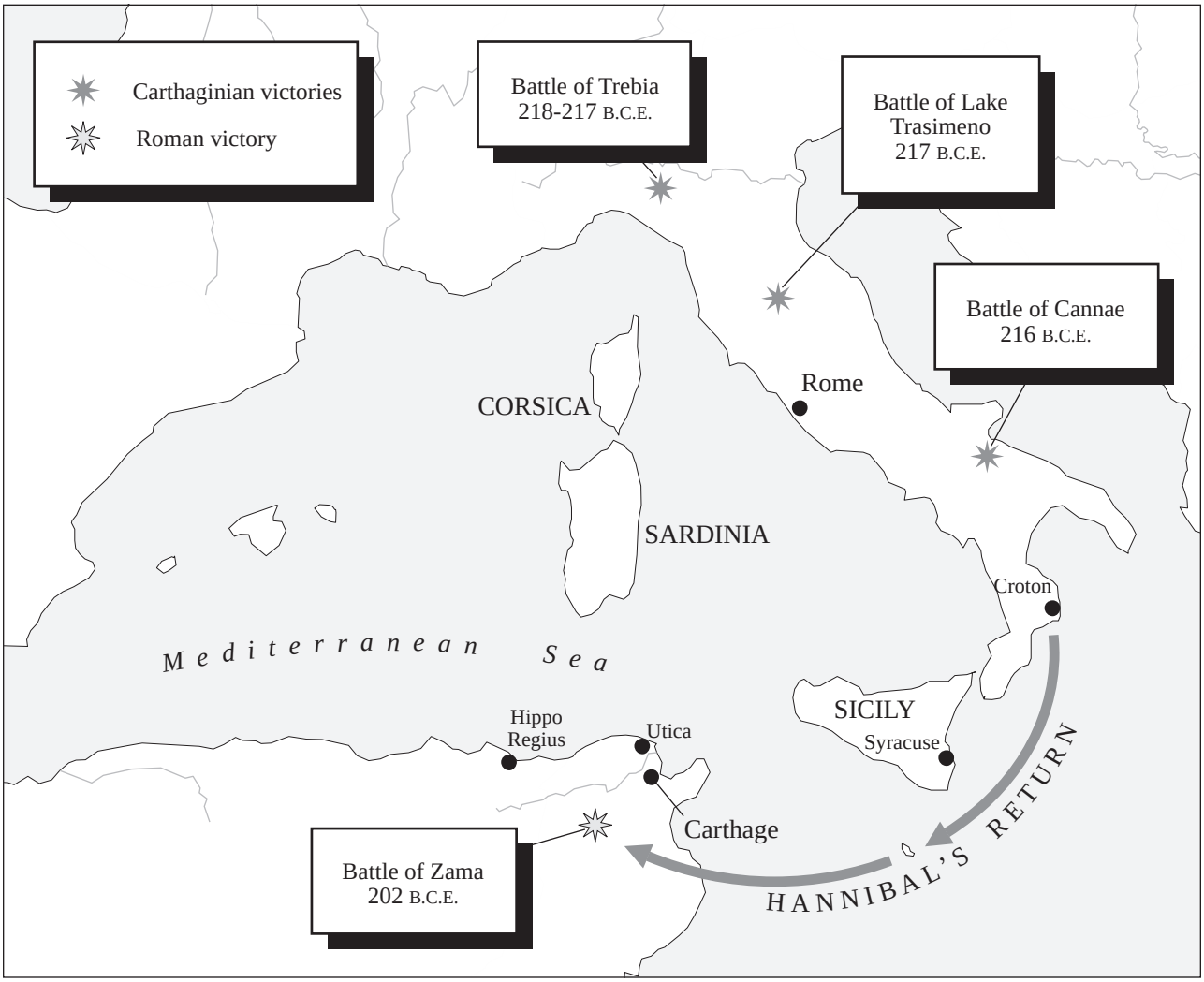
Turning Points

247 B.C.E.	Hamilcar Barca is appointed Carthaginian military commander, marking the emergence of Carthage as a major military threat.
237 B.C.E.	Hamilcar begins a Spanish military campaign, in preparation for ultimate war with Rome.
221 B.C.E.	Hamilcar's son Hannibal takes command of the Carthaginian military.
218 B.C.E.	Hannibal leads a force of war elephants, cavalry, and foot soldiers across the Alps to trap and defeat the Romans at Trebia.
216 B.C.E.	Hannibal issues Rome its greatest defeat in battle at Cannae.
202 B.C.E.	Scipio Africanus defeats Carthage at the Battle of Zama.
146 B.C.E.	The Third Punic War ends; Carthage's threat to Rome's domination is defeated.

Weapons, Uniforms, and Armor

There is little historical evidence relating to the weapons, uniforms, and armor used by the Carthaginian army and navy. The polyglot army that Hannibal fielded in the Second Punic

Battles of the Second Punic War, 218-202 B.C.E.



War was a unique mixture of Africans, Spaniards, Celts, Numidians, and Libya-Phoenicians, along with Greeks, Persians, and Egyptians. Hannibal's army was international in its racial and ethnic composition and was extremely loyal in its dedication to its supreme military leader. Hannibal used his heavy and light infantry divisions as maneuver units to unbalance enemy forces and his heavy and light cavalry divisions as his main strike force on the battlefield to annihilate the enemy forces.

The weapons, armor, and uniforms of Hannibal's infantry reflected the rich diversity of its fighting soldiers. The famous African heavy infantry were formidable, tenacious, and highly trained fighters from northern and western Africa. They wore a variety of colorful uniforms and clothing and were heavily armed with long and short battle swords, bows and arrows, and lances, as well as an assortment of other exotic weapons, which they used with deadly efficiency in battle. The African heavy infantry, which proved itself at the Battle of Cannae (216 B.C.E.), wore chain mail and carried shields for protection.

Hannibal recruited the courageous and tough-fighting Spanish infantry, heavy and light, from the

Iberian tribes of Spain. The Spanish light infantry were armed with javelins, darts, slings, and wooden shields, whereas the Spanish heavy infantry were dressed in chain mail and armed with javelins, as well as the noted heavy steel sword later adopted by the Roman heavy infantry. The Celtic light infantry were recruited from the Po River Valley in Italy and were armed with swords. They wore no armor and fought nude or half naked. Finally, the proud and sagacious Libya-Phoenicians were recruited from the Carthaginian elite classes, wore chain mail armor, and expertly used the battle weapons of the Greek hoplite. The Libya-Phoenicians formed the elite backbone of Hannibal's Carthaginian army in Italy, and they would prove their mettle repeatedly in countless battles and campaigns.

The heavy and light cavalry forces in Hannibal's army were also a polyglot mixture of nationalities, races, and languages. The cavalry corps were Hannibal's strategic strike force and implemented his orders on the battlefield with both precision and decisiveness. The elite heavy cavalry were composed of a small number of Carthaginians and Libya-Phoenicians, highly expert fighters on or off their battle horses and drilled in every conceivable cavalry maneuver. The Spanish heavy infantry comprised the bulk of Hannibal's heavy cavalry force, and they dressed in helmet and mail armor and were armed with short and long lances, short swords, buckler-shields, and greaves (armor for the leg below the knee).

The magnificent light cavalry force comprised the Numidians, a North African people famous throughout the Mediterranean region for their outstanding mobility and expert fighting abilities. In battle, the Numidians wore their famous leopard skins and used swords, short javelins, and lances to maneuver expertly around and through their enemies, seeking a fatal weakness before striking. Finally, Hannibal used African battle elephants both to anchor his lines and to launch, along with heavy and light cavalry, combined-arms shock assaults to disorient and defeat the enemy on his front and rear. It has been argued that Hannibal also used his elephants along his route of march to impress and frighten European tribes to join his army.

The battle-hardened Carthaginian army constantly changed its weapons systems, military uniforms, and body armor after each successful battle with the Romans. This exchange of military technology and weapons systems was an integral component of Hannibal's war in Italy and proved decisive in allowing his forces to fight against Rome.

MILITARY ORGANIZATION

The military organization of the Carthaginian army stands unique in the history of the ancient world. Carthaginian leaders had decided early on that a standing professional army recruited from the general population of eligible men would ensure neither national security nor the worldwide advancement of Carthage's foreign economic policy interests. After enduring a period during which Punic generals and admirals sought to control the state's political policy, Carthage's Council of Elders ruled that the recruitment of trained mercenaries from the western Mediterranean region and elsewhere would be sufficient to meet military requirements in case of war.

The traditional military organization of the Carthaginian army was the Greek hoplite phalanx. Carthage inherited this military tactical system from the Phoenician cities of Tyre and Sidon, and it was a prominent tactical system in most ancient militaries, including that of Rome. However, Hannibal fundamentally altered the hoplite system to gain flexibility and tactical maneuverability in battle. His changes were designed to ensure maximum coordination and communication between the main strike force, the cavalry, and the main maneuver force, the infantry.

The importance of decisive battlefield communications, rapid logistical support, accurate military intelligence, and sound battlefield leadership was constantly communicated to officers and soldiers. As the historical record indicates, Hannibal tried to maximize surprise and shock against the enemy, attacking the enemy in difficult geographical areas, making the enemy fight up hilly terrain, or driving the enemy cavalry from the field of battle in order to launch attacks against the remaining enemy on his front or rear. In this context, Hannibal developed and trained

an effective corps of officers, known for their toughness, wisdom, bravado, and discipline.

Doctrine, Strategy, and Tactics

The strategic political doctrine of the Carthaginian Empire was based both on satisfying its national security interests and on maintaining its worldwide commercial relations and trade routes. After the negative outcome of the First Punic War, Carthage's strategic doctrine took into account the empire's depleted resource base, its weakened battle fleet and naval troop transport capability, and its severe manpower limitations in any future conflict with Rome. Carthage had a military manpower base of 100,000 to 120,000 fighting men for its army and navy and a 30,000- to 35,000-man cavalry force, out of an estimated total population base of 700,000 citizens. In contrast, Rome and its allied states had a strategic military manpower base of 700,000 foot soldiers and 70,000 cavalry forces, and, for combat operations, Rome could deploy within a year more than 250,000 foot soldiers and a 23,000-man cavalry force. Based on these comparative manpower data, a war of attrition was out of the question for Carthage.

For this reason, the Barcid clan reasoned that any future war with Rome would have to be fought in Italy, in order to break the wills of the Roman Senate and the Roman people. This position, advocated by Hannibal, argued that Carthage could prevent Rome from launching major invasions of Carthage, Spain, or other important overseas territories only by launching aggressive combat operations in the heart of the Roman state. The Barcid clan also reasoned that Carthaginian military land forces executing a major land war against Rome and contiguous territories could not expect military reinforcements from the sea while facing overwhelming Roman land armies. In this specific context, the Carthaginian forces would need to inflict serious manpower losses on the Roman army while minimizing their own losses until military reinforcements could arrive from either Carthage or Spain.

At a deeper level, Rome's increasing land and naval power operations in the western Mediterranean

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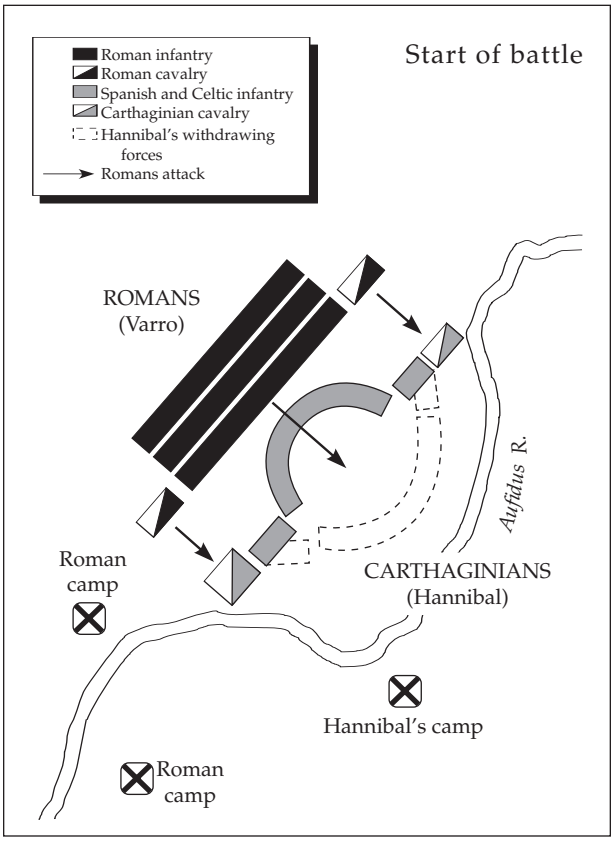
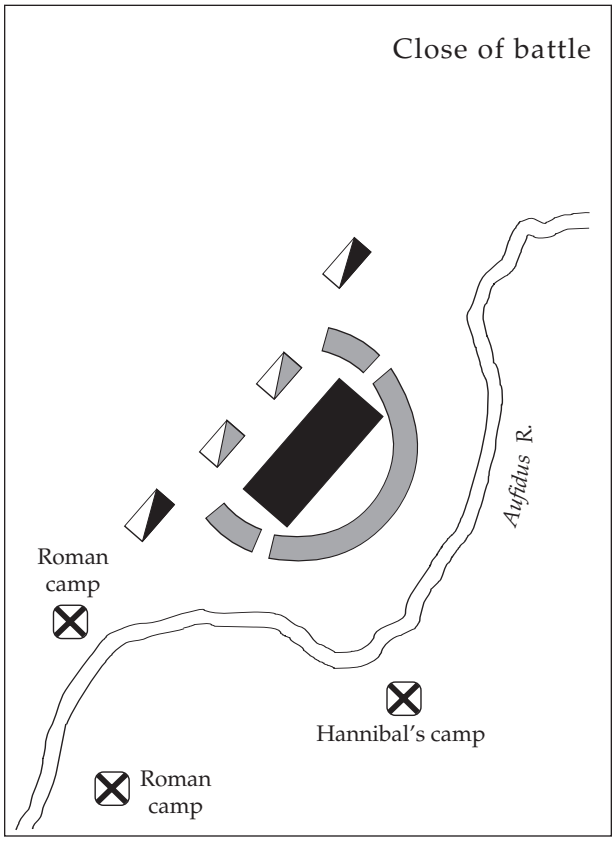
Hannibal's army crosses the Rhone River in 218 B.C.E. on its way to invade Italy. Hannibal made the most famous use of war elephants with his crossing of the Alps in this Italian campaign.

CANNAE, 216 B.C.E.





region proved a challenge to Carthaginian military strategy. Carthage could no longer adequately control sea lanes for military and commercial purposes; transport troops to danger spots; supply, reinforce, or extradite troops from overseas bases; or protect Carthage and Africa from Roman raids and invasion. For the Punic military and naval planners, the lack of robust naval forces to deter the powerful Roman navy had a profound impact on subsequent strategic military planning and tactical operations.

The implementation of Carthage's strategic military doctrine in the light of Rome's military resources and manpower preponderance was not easy. Hannibal's rise to power injected a new strategic dynamic factor, namely Hannibal's military genius and leadership capabilities, into Roman and Carthaginian foreign security relations. On the ground, Hannibal's offensively oriented strategy was based on the following principles: to win battlefield victories and encourage the defection or the neutrality of Rome's allies and, if militarily decisive in battle, to force Rome to negotiate a compromise peace on Carthaginian terms.

On the battlefield, Hannibal's operational doctrine was to execute the war against Rome using Rome's own material resources, instead of those of Carthage. Hannibal's decision to engage Rome in its own territory and use its resources was consistent with Punic strategic military doctrine against fighting wars of attrition. The objective was to fight a war for victory in Italy and, at the very least, to achieve a negotiated settlement, which would leave Carthage and its territories free of Rome. The implementation of this tactical doctrine required Hannibal to utilize a variety of military factors to engage, fight, and defeat the much larger and better-equipped Roman army in

Italy for more than fifteen years. Among the tactics he employed were successful battlefield maneuvers, strategic and tactical surprise, psychological warfare, mastery of the geographical terrain, and military intelligence.

However, Hannibal's war strategy was ultimately unsuccessful. Rome's military manpower and preponderance of material resources, combined with its improved military generalship, very powerful battle fleets, and large land forces, proved strategically overwhelming. The direct result was the inevitable dissolution of the Carthaginian Empire.

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Ab urbe condita libri (c. 26 B.C.E.-15 C.E.; *The History of Rome*, 1600), by the ancient Roman historian Livy (59 B.C.E.-17 C.E.), is one of the primary reference sources that classical and modern scholars have used to "reconstruct" the great political, economic, and military struggle between the mature African power, Carthage, and the rising Italian power, Rome. Livy's critical analysis of the Punic Wars was based in the prevailing Roman worldview, and in his writings Livy painted both Hannibal and Carthage in less than friendly terms. He provides the student of Carthaginian warfare, however, with some insights into the character, intensity, and implications of Hannibal's military engagements with Rome from a Roman point of view.

Polybius (c. 200-c. 118 B.C.E.), a Greek historian taken as a prisoner to Rome in 168 B.C.E., wrote a series of histories of Rome and nearby countries from 220 to 146 B.C.E. (*The General History of Polybius: In Five Books*, 1773). His work contributed to the development of historiography as a significant area of inquiry away from previous leanings toward didacticism. Tiberius Catius Asconius Silius Italicus (25 or 26-101 C.E.), a Latin epic poet and politician, authored a seventeen-volume epic on the Second Punic War, entitled *Punica* (*Punica, with an English Translation*, 1934). Appianos, also known as Appian, a second century C.E. Greek historian, authored *Romaica* (*Appian's Roman History*, 1912-1913), a history of Rome and its conquests, including that of Carthage.

A more modern work that provides an interesting analysis of the origins of the First and Second Punic Wars using ancient sources exclusively is B. D. Hoyos's *Unplanned Wars: The Origins of the First and Second Punic Wars* (1997). Hoyos uses Roman historical writers such as Polybius, among others, to look deeply into the origins of the conflict between Carthage and Rome. The tightly argued historical analysis reexamines both ancient evidence and recent findings about the origins of the Punic Wars and the major personalities and events of the great struggle.

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Michael J. Siler

Roman Warfare During the Republic

Dates: 753-27 B.C.E.

Military Achievement

According to tradition, the city of Rome was founded on the banks of the Tiber River in 753 B.C.E by Romulus, one of the twin sons of Mars, the Roman god of war. At the time of its founding, Rome's proud future still lay far in the distance. A dynasty of foreign kings from neighboring Etruria eventually settled at Rome and dominated the institutions of the city. Although this early history is uncertain, Rome's levy seems to have relied on the wealthy, because they could afford their own equipment for battle. Armed like Greek hoplites, Roman soldiers fought with thrusting spears, and, using a Greek formation—the phalanx—they stood shoulder to shoulder, with shields locked together.

After expelling the last of the Etruscan monarchs in 510 B.C.E, the Romans installed a Republican government, dominated by the Senate, and kept the Greek style of fighting. About a century later, however, some changes were introduced during a long war with Veii, an Etruscan stronghold north of Rome. In need of more soldiers, the Romans began recruiting more broadly. These new recruits, unable to afford full protective armor, adopted the *scutum*, a long Italic shield, in place of the hoplite's round buckler. Moreover, the Romans introduced pay for military service and, for the first time, provided at public expense a horse for every new member of the cavalry.

The Roman victory over Veii was followed by defeat on the Allia, a stream about 11 miles north of Rome. There, in around 390 B.C.E., Gallic warriors overwhelmed the Republic's forces, capturing and plundering the city before moving on. The conquering Gallic chieftain Brennus uttered the harsh words "Vae victis," meaning "Woe to the vanquished!" This disaster revealed Rome's military weaknesses and stirred reform. No longer fighting as a single compact body, the Romans came to employ a looser formation, composed of small units, or maniples. After abandoning the thrusting spear, Rome's soldiers also came to adopt a throwing spear.

Eventually Rome's influence managed to spread beyond the neighboring communities of Latium and into southern Italy. Greek cities, established there centuries earlier, called on Pyrrhus of Epirus (r. 297-272 B.C.E.) to stop the advance. With his war elephants, Pyrrhus defeated Rome's forces at Heraclea (280 B.C.E.) and Ausculum (279 B.C.E.) but also suffered enormous casualties. He exclaimed that another victory such as his last would be the ruin of his army. After Beneventum in 275 B.C.E. he withdrew from Italy, never to return. By 264 B.C.E Rome controlled all of the Italian peninsula except the Po valley in the north.

Rome then turned to Sicily, vying for control of the island with Carthage, a powerful city on the North African coast. During the First Punic War (264-241 B.C.E.), Rome mobilized large fleets for the first time. Although Romans were inexperienced at sea, Rome's invention of a grappling hook and boarding bridge allowed soldiers to cross over to enemy ships and fight on their decks like infantry. With a final naval victory in 241 B.C.E., Rome expelled the Carthaginians from Sicily.

A generation later, the Second Punic War (218-201 B.C.E.) revived old grudges. With an eternal hatred of Rome, the Carthaginian general Hannibal (247-182 B.C.E.) planned to win the war through a bold surprise invasion of the Italian peninsula. Hannibal made a winter crossing of the Alps to enter Italy and gain victories at Trebbia (218-217 B.C.E.), Trasimeno Lake (217 B.C.E.), and Cannae (216 B.C.E.). However, Rome sent forces against his base in Spain

and eventually confined him to the "toe," or southernmost tip, of Italy. After sixteen years in enemy territory, Hannibal finally withdrew to Africa, where he was crushed at Zama (202 B.C.E.) by Scipio Africanus (236-184 or 183 B.C.E.). Hannibal escaped the battlefield and urged his countrymen to surrender. Carthage lost some of its African territory to Rome's allies, and Spain was eventually organized as Roman territory.

Hannibal's alliance with Philip V (238-179 B.C.E.) of Macedonia led to two Macedonian Wars, in which Roman troops crossed the Adriatic Sea and at last secured victory at Cynoscephalae in 197 B.C.E. Although Macedonia survived and Greece was declared free, Rome's influence came to dominate the whole area. Once involved in the eastern Mediterranean, Rome's forces also accepted the challenge of Syria's Antiochus III (242-187 B.C.E.), also known as Antiochus the Great. After victory at Magnesia in 190 B.C.E., the Republic refused to annex any new territory, but it now arranged the affairs of Hellenistic Asia as it wished.

At Pydna (168 B.C.E.) the Republic defeated Philip's son, Perseus (c. 212-c. 165 B.C.E.). Macedonia was eventually organized as a Roman province, and its governor was made responsible for Greece. Moreover, Egypt was treated like a dependency. When Antiochus IV (c. 215-164 B.C.E.) invaded the Nile Delta, a Roman ambassador is said to have drawn a circle around the Syrian king and commanded him to order a retreat before stepping out of it. The Third Punic War (149-146 B.C.E.) resulted in the complete destruction of Carthage in 146 B.C.E, and the city's remaining territory became the province of Africa. Thus with the defeat of Carthage and Hannibal's allies, the Republic had destroyed its greatest enemies. Although more wars lay in the future, Rome's long-term dominion was ensured.

WEAPONS, UNIFORMS, AND ARMOR

The ancient sources present a reasonably clear picture of the Republic's military affairs as it emerged from the struggle with Hannibal. All Roman citizens between the ages of seventeen and thirty-six were liable for service. The maximum length of service was likely sixteen years for infantry and ten for cavalry, but in normal circumstances a soldier would probably serve for up to six years and then be released.

The number of the main infantry division, the legion, is given as 4,200 soldiers, but in emergencies it could be higher. The legion was drawn up in three lines of *hastati*, *principes*, and *triarii*, with the youngest and poorest forming the *velites*. As lightly armed skirmishers, the velites carried a sword, javelin, and small circular shield. The hastati and principes, in contrast, were heavily armed. Protected by the long Italic shield, they relied upon a short Spanish sword, or *gladius*, and two throwing spears, or *pila*. Like the

North Wind Picture Archives via AP Images

Soldiers of the Roman Republic, bearing spears, swords, shields, and standards with the initials SPQR, for "Senatus Populusque Romanus," or, "the Senate and People of Rome."

hastati and principes, the triarii were also heavily armed, but they carried a thrusting spear, or *hasta*, instead of the pilum. All soldiers wore a bronze breastplate, a bronze helmet, and a pair of greaves, or shin guards. In order to be distinguished from a distance, the velites covered their helmets with wolfskin, and the hastati wore three tall feathers in their helmets. To preserve a degree of exclusiveness, wealthy recruits wore shirts of ring mail, whether serving among the hastati, principes, or triarii.

MILITARY ORGANIZATION

The supreme magistrates of the state, the two consuls, usually served also as generals of the army. Elected to serve for one year, each consul traditionally commanded two legions. His authority, called imperium, was absolute beyond the walls of the city. The fasces, a bundle of rods and axes bound together by red thongs, symbolized the consul's power of life and death. After victory, the consul was decked with laurel and borne before the general by twelve attendants, or lictors, proceeding in single file.

The general's senior officers included the military tribunes. With six in each legion, all tribunes were required to have significant military experience and to meet stringent property qualifications. Usually most, if not all, were elected. They had some important military responsibilities. As elective officers, they more often tended to the welfare of the soldiers. By the early second century, it was also customary for the general to be accompanied by legates. Appointed by the Senate on the general's advice, these were often ambitious young men from prominent families, who had little military experience.

The real strength of Rome's military was the centurions, career officers who, as one contemporary observed, held their ground when bested and stood ready to die at their posts. There were sixty centurions in each legion, with two in each of thirty maniples. Selected by the tribunes, the centurions were organized into a hierarchy with a well-defined order of promotion. Every centurion's ambition was to serve as primus pilus, senior officer of the first maniple, because the holder of that title was recognized as the best soldier of the legion and given a seat on the general's war council.

In addition to infantry, the legion had three hundred cavalrymen. They wore linen corselets and relied on strong circular shields and long spears. They were divided into ten units, or *turmae*. Each of these had three decurions, and the most senior of the three always exercised command. Allied contingents, recruited from throughout Italy, also campaigned with Rome's citizen army. In fact, there was at least one legion of allies, if not more, for every legion of citizens. Known as *socii*, they were organized and equipped like Romans. They were also commanded by Roman citizens called *praefecti*. An elite corps, the *extraordinarii*, was selected from the best of the allies, horse and foot. The rest were divided into *alae*, right and left wings, reflecting their positions on the army's flanks. The great numbers of the socii especially contributed to the might and effectiveness of Rome's forces.

DOCTRINE, STRATEGY, AND TACTICS

After assembling with their arms, the soldiers would be ordered to pitch camp. It resembled a city, complete with a forum and tents arranged in neat rows. The *via principalis*, or "first street," ran past the tents of the senior officers, and the *via quintana*, or "fifth street," paralleled the main boulevard. During the time of the Republic, these camps were usually temporary. Because commanders always employed the same plan, every soldier knew the camp's layout and could find his way around, even in the dark. In addition to soldiers and officers, the camp also housed animals, equipment, baggage, and sometimes plunder taken from the defeated enemy. Moreover, there were hosts of camp followers. In 134 B.C.E., for example, numerous traders, soothsayers, and diviners, as well as two thousand prostitutes, were cast out of a camp near Numantia in Spain.

Yet the camp remained an integral part of Republican strategy. As an entrenched fortress, it provided a base for attack and a safe retreat in the event of defeat. The guarding of its gates therefore required discipline. Those who fell asleep during the night watch

TURNING POINTS

753 B.C.E.	The city of Rome is said to be founded on the banks of the Tiber River by Romulus, one of the twin sons of Mars, the Roman god of war.
c. 390 B.C.E.	Gallic warriors overwhelm the Republic's forces, capturing and plundering the city of Rome.
241 B.C.E.	In the final naval victory of the First Punic War, Rome expels the Carthaginians from Sicily.
202 B.C.E.	Rome defeats Carthage at the Battle of Zama.
168 B.C.E	The Roman Republic defeats Macedonian king Philip V's son, Perseus, at Pydna, eventually organizing Macedonia as a Roman province.
146 B.C.E.	Rome defeats Carthage in the Third Punic War, destroying its greatest enemy and ensuring its long-term dominion.
60 B.C.E.	The First Triumvirate is formed.
27 B.C.E.	Augustus establishes the Roman Empire.

were usually stoned to death. This harsh discipline extended to the field of battle, where a maniple, giving ground without good reason, could be, literally, "decimated." A tenth part of its men, selected by lot, would be clubbed to death, while the rest would be ordered to sleep outside the camp's fortifications on an unprotected spot. In contrast, there was also a system of military decorations to reward exceptional bravery. The general praised heroic soldiers before the assembled army and gave them prizes. To the first man mounting the enemy's walls, for example, he conferred a crown of gold.

On breaking camp, procedure had to be followed. On the first signal, the soldiers took down their tents. On the second, they loaded the pack animals. On the third, their march began. When attack was not expected, all moved in one long train, the extraordinarii leading the way. In times of danger, a different marching order prevailed. The hastati, principes, and triarii formed three parallel columns. When the enemy appeared, the maniples turned to the left or to the right, clearing the baggage trains and confronting the enemy from whichever side necessary. Thus in a single movement, the army placed itself in good battle order.

When engaging the enemy, the legion approached in three lines: first, the hastati; second, the principes; third, the triarii. Each line consisted of ten maniples, drawn up with gaps between them, equal in width to the maniples. These gaps usually alternated in each row, like dark spaces on a checkerboard. Thus the gaps in the first line adjoined the maniples in the second line. Likewise, gaps in the second line adjoined maniples in the third.

Traditionally, the battle followed a more or less schematic plan. Forming a light screen, the velites opened with a hail of javelins and retired to the rear through the gaps. Then the hastati, closing the gaps in the first line, offered a united front against the enemy. After surging forward in unison and striking with their swords, the soldiers soon recoiled, rested, and tried again. If the assault continued to fail after many attempts, the hastati retired through the gaps in the line of the principes, who next advanced and attacked in the same manner. If the principes also failed, then they retired through the gaps in the line of the triarii, who proceeded to the final trial of strength, reinforced by survivors from the first and second lines. The Romans thus refused to expose all their forces to a frontal assault, keeping part of them in reserve, while the rest engaged the enemy.

On the whole, Roman strategy aimed at the destruction of the enemy in pitched battle. This strategy sometimes employed flexible tactics. In 169 B.C.E., for example, the Romans borrowed a formation from the gladiatorial arena. In this formation, called the "tortoise," or *testudo*, several ranks locked their shields together and formed a sloping roof over their heads. They advanced to the lowest part of the enemy's wall, where some of the Romans then mounted the roof of shields. After moving up its slope, they occupied the high end, where they fought face to face with the wall's defenders. Finally overwhelming their opponents, the victorious Romans crossed over into the enemy city and captured it.

Under a strong general, the storming and plundering of a city proceeded by well-defined stages, an-

nounced by signals. First the troops slaughtered. Next they looted. Finally they disposed of their spoils, with the profits distributed equally among all the soldiers. More often, however, the general made little attempt to restrain them. They held the power of life and death, and they did whatever they wished to the inhabitants of a captured city. In these cases, of course, every soldier looted for himself, and everything he laid his hands on became his private property.

Saluted as *imperator* by his troops, the successful general looked forward to a triumph, the most distinguished reward conferred by the Senate for military achievement. This ceremony celebrated important victories and was granted only under certain conditions, such as extraordinarily numerous enemy casualties and significant expansion of Roman territory. The triumph was a magnificent procession in which the victorious general, with laurel wreath on his brow and ivory scepter in his hand, mounted a chariot drawn by white horses and paraded through the streets of Rome. Before him were the spoils of conquered cities and captive leaders imprisoned in chains. After him followed his troops in military array, enjoying unusual license and singing bawdy songs. The procession formed upon the Campus Martius, the field of the war god Mars, and entered the city through the Triumphal Gate. It then ascended the Capitol, where the general offered sacrifice and dined with Jupiter, the king of the gods and goddesses. The entire population participated with unbounded jubilation in this ceremony of great pomp and circumstance. After all, the general was, at least temporarily, a god-king. However, as a reminder, a slave would be stationed near the general throughout the parade, occasionally whispering in his ear, "Remember! Thou art a man."

REFORMS OF THE LATE REPUBLIC

Although late second century B.C.E. Roman legions again met defeat, eventually Gaius Marius claimed victory for the Republic, in Africa over King Jugurtha (c. 160-104 B.C.E.) of Numidia and in northern Italy over the Teutons (102 B.C.E.) and the Cimbri (101 B.C.E.). While holding an unprecedented series of consulships in 107 and from 104 to 100, Marius encouraged military reform, and he has been credited by some with the conversion of Rome's citizen militia into a standing professional force. Marius undoubtedly played an important role in the evolution of Rome's military.

As in past crises of state, Marius opened the ranks to the *capite censi*, citizens who failed to meet prescribed property qualifications for military service. He likely viewed this measure as a temporary emergency action, but later generations followed his example. Immersed in wars both foreign and domestic, Marius's successors abandoned all restrictions on liability for service and recruited more troops than ever before. Because most of these soldiers came from poor families, the State equipped them at public expense. So variations in arms and armor soon disappeared.

Marius also made fundamental changes in tactical organization, preferring the cohort to the maniple as the basic unit within the legion. Marius's new cohort consisted of three maniples, one drawn from each line: hastati, principes, and triarii. As a result, his cohort was a microcosm of the old legion. The First Cohort consisted of the three maniples situated on the extreme right of the old lines. The last cohort, the Tenth, moving from right to left, consisted of the three maniples on the extreme left.

Marius's new legion drew up for battle in three lines. There were four cohorts in the first line, three in the second line, and three in the third. The cohorts likely had a standard size, which under the Empire was 480 men. Thus the new legion seems to have had a strength of 4,800 men, organized into ten cohorts and thirty maniples. The velites were apparently abolished. Eventually the Roman army incorporated contingents raised outside Italy. These new contingents carried their national weapons and were called *auxilia*. Some came from independent allies, others came from forced levies, and still others were paid as mercenaries.

In the press of battle, standards, banners on long poles, served as a rallying point. Marius gave preeminence to the *aquila*, or eagle, as the legion's chief standard. The legion had previously used a variety of standards, including the eagle, wolf, minotaur, horse, and boar, among others. Yet by the Republic's close, the eagle shared importance only with the standards

of the hastati and principes, which consisted of slender poles decorated with circular bosses. The primus pilus, the best soldier in the legion, acted as *aquilifer*, or eaglebearer. To lose or surrender the aquila was, of course, a great disgrace for the entire legion.

Along with these changes, Marius modified the pilum. The iron tip of Rome's heavy spear was joined to its wooden shaft by two iron rivets. Marius replaced one of these with a wooden pin, and on striking a target the shaft now snapped off. The spear could no longer be picked up and thrown back at its owner. Moreover, Marius wished to reduce the great numbers of pack animals, because they slowed the army's march, so he required his troops to carry equipment and rations on forked poles flung over their shoulders. As the general's beasts of burden, the legionaries came to be called "Marius's Mules."

WARS OF THE LATE REPUBLIC

In Marius's later years, violence spread across the Italian peninsula, with serious repercussions for the Republic. Weary of Rome's stern ascendancy, the Italian allies rose in revolt. Fearful but wise, Rome promised citizenship to all who laid down their arms. Although the Social War (91-88 B.C.E.), as it was called, soon ended, the riot of its daily warfare created an angry generation whose sons found lodging in Rome's legions, filling them with a spirit of apathy and callousness. These soldiers cared little for the Republic and were loyal only to the general who paid them.

Almost inevitably, civil war followed the Social War. As one of its leaders, Marius died in 86, before destroying all of his opponents. His archenemy, Lucius Cornelius Sulla (138-78 B.C.E.), survived to conduct a great bloodbath and hold untrammeled authority until his own death. Under these chaotic conditions, only small military gains were made abroad. Yet when Mithridates VI of Pontus seized Asia Minor and invaded Greece, he was defeated by Pompey the Great (106-48 B.C.E.), who annexed Syria and Palestine, thereby enlarging Rome's Asiatic dominion.

Only a few years later, bold adventures began to unfold in Gaul. Julius Caesar (100-44 B.C.E.) embarked on a war of conquest against warrior Celts and their powerful priests, the Druids. With his small force, Caesar opposed the large Celtic armies and eventually defeated the Gallic tribes, organizing their territories as a province. At the same time Caesar accelerated the gradual professionalization of the Roman army.

Caesar followed tradition by relying upon the cohort and the centurion, although his military tribunes were mostly young men with political charges. Yet Caesar's legates, ten in number, played an essential role in his command structure. Acting as subordinate commanders, some commanded legions and auxiliary forces, while others managed the camp and secured the surrounding region. Perhaps even more important, Caesar's battle order responded dramatically to topography. He exploited flank attacks, for example, and often held troops in reserve for the decisive onslaught. Caesar thus helped to liberate Roman warfare from the traditional scheme of advance and assault.

Like a great Hellenistic king, Caesar raised siege towers, built bridges to span fierce rivers, and dug elaborate entrenchments around enemy bases. His formidable artillery included giant catapults, which fired heavy stones, and smaller *scorpions*, which fired arrows with extraordinary accuracy. Apart from his tactical expertise, Caesar's personal qualities also invited his success as a commander. More often than not, his decisiveness and instinct compensated for his reckless daring.

Despite the continued Roman military success, by 49 B.C.E. the Republic was again divided by civil war. Caesar crossed the Rubicon and swept through Italy into Greece, where he defeated Pompey. Embroiled in Rome's affairs, the Pharaoh of Egypt soon fell to Caesar's arms as well. Then Pharnaces (r. 63-47 B.C.E.), son of Mithradates the Great, took his turn, losing at Zela (47 B.C.E.). To underscore the rapidity of this victory, Caesar employed three short words, "Veni, vidi, vici," meaning, "I came, I saw, I conquered." Other civil war battles followed in Africa and Spain. Caesar prevailed in all and returned to Rome with unprecedented power, as dictator for life. However, by the Ides of March, 44 B.C.E., he lay dead, murdered by conspirators.

Through civil war Caesar's heir, Octavius (63-

14 B.C.E.), claimed unrivaled supremacy. He then adopted a new name, Caesar Augustus, and, ruling as Rome's first emperor, he replaced the citizen militia of the Republic, which had become increasingly unmanageable and restless, with a smaller professional force. Legionaries eventually served for twenty-five years, enjoyed promotion through the ranks, and received generous cash payments on discharge. Except for a special corps, they were stationed in the frontier provinces, at a safe distance from the imperial capitol. Augustus's reign thus signaled a new epoch in Roman political and military history, as well as the end of the Republic in 27 B.C.E.

In conclusion, the military institutions of the Republic proved extremely durable and successful. With great adaptability, the Romans learned from their opponents, borrowing weaponry and improving tactical structure. Rome's forces were also guided in a few critical moments by generals of genius. Yet the most fundamental reason for the Republic's success lay in its manpower, fueled by the populations of Italy, which allowed the Romans to ignore defeats. Thus Rome's military evolved from obscurity into a remarkable institution, which eventually dominated the ancient Mediterranean and shaped one of history's longest-lived empires.

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Denvy A. Bowman

Roman Warfare During the Empire

Dates: 27 B.C.E.-476 C.E.

Military Achievement

The imperial Roman army was arguably one of the most impressive fighting forces the world has ever known. Its military campaigns greatly expanded the territory of the Roman Empire. In the first century C.E., Rome began the conquest of Britain, and in the second century, it conquered Dacia, modern Romania, and parts of modern Jordan and Iraq. The Roman army also defended the Empire against a wide range of enemies along its frontiers, including the Caledonians in northern Britain, various Germanic tribes, the Sarmatians, the Parthians, the Sāsānian Persians, and desert peoples in North Africa. Roman soldiers were highly skilled in pitched battle, siegecraft, and military engineering. In the course of their campaigns Roman troops built military roads, bridges, and large permanent camps, many of which eventually became cities in Europe, the Middle East, and North Africa.

Weapons, Uniforms, and Armor

At the beginning of Augustus's reign as emperor in 27 B.C.E., Roman legionary infantrymen wore a simple round helmet with a horsehair tail at the top as well as a chain mail shirt known as a *lorica hamata*. The latter consisted of interlocking metal rings and provided good protection but was, however, very heavy and took a long time to manufacture. Later in Augustus's reign infantrymen began to use a new type of helmet, of Gallic origin, which was more closely fitted to the skull and included neck and cheek guards. In addition, possibly due to a major loss of military equipment in the German defeat of three legions in the Battle of Teutoburg Forest (9 C.E.), the Roman infantry began to use a new type of breastplate known as the *lorica segmentata*. This armor consisted of horizontal metal bands covering the chest and abdomen as well as vertical metal bands protecting the shoulders. This could be manufactured much more quickly than mail armor and was very flexible. However, the fittings that held the bands together were easily damaged; as a result, this type of armor was in constant need of repair. Early imperial infantrymen also wore greaves, or shin guards, on their legs as well as leather strips called *pteurages* that were attached to their body armor and provided protection for their thighs and upper arms.

The principal weapon of early imperial legionary infantrymen was a short sword called a *gladius*, which was modeled after that of the Spanish Celts and used for hand-to-hand combat. Infantrymen also carried a javelin, or *pilum*, which was hurled at the enemy from a distance, as well as a thrusting spear known as a *hasta*. The large semicylindrical shield, or *scutum*, was probably of Celtic origin and derived from flat oval shields. By the first century C.E. its upper and lower curved edges had been removed, giving it a more rectangular shape. Legionary infantrymen were also equipped with a dagger, which, like the gladius, was of Spanish origin.

Roman officers of the early Empire wore the same Gallic-type helmets worn by the infantry and a variety of body armor, including mail shirts, cuirasses that were modeled after the human torso, or scale shirts known as *loricae squamatae*. The latter consisted of overlapping metal scales arranged in horizontal rows and fastened to a foundation of linen or hide. This type of armor was easy to make and repair and, when polished, gave the wearer an impressive appearance. However, it was not very flexible, and its wearer was vulnerable to a sword or spear thrust from below.

Under the early Empire, troops of the *auxilia* used equipment that was generally inferior to that of the legionaries; however, they began to receive better-

quality equipment during the reign of the emperor Trajan (c. 53-c. 117 C.E.). The infantry wore a variety of helmets as well as leather tunics covered with metal plates or mail, and used narrow, flat, sometimes oval shields. Their principal weapons were the hasta and the *spatha*, a long sword that became the dominant form of sword throughout the Roman army by the early third century. Cavalrymen wore iron helmets that covered the entire head except for the eyes, nose, and mouth. They wore either mail or scale body armor and used the same weapons as did the infantry of the auxilia cohorts. Although they did not use stirrups, they were firmly anchored on horseback by the four projecting horns of their saddles.

During the crisis of the third century C.E. the Roman Empire experienced increased invasion and internal chaos but lacked a centralized military supply system. Armies were consequently forced to salvage equipment from battlefields or to obtain it on their own from other sources, which, in turn, led to an end to uniformity in the appearance of soldiers. During this period, the lorica segmentata was gradually abandoned, and soldiers increasingly made use of mail shirts as well as an improved form of scale armor. In this type of armor, which did not require a foundation, the scales were ringed together vertically as well as horizontally. The scales were therefore locked down, and the wearer was much less vulnerable to a thrust from below. Moreover, the older Gallic helmet was replaced by a new helmet of Sarmatian origin, the *spangenhelm*, which consisted of several metal plates held together in a conical shape by reinforcement bands. This helmet, which included cheek, neck, and nose guards, was used by both infantry and cavalry. In addition the scutum was replaced by a large-dished oval shield covered with hide or linen. Cavalry units used a similar type of shield that featured the insignia of the bearer's unit.

In the late third century C.E., the emperor Diocletian (c. 245-316 C.E.) established a series of state-run arms factories, or *fabricae*, in an attempt to remedy the supply problem. However, these factories failed to restore uniformity in military equipment due to the fact that a wide range of barbarian peoples were serving in the Roman army by this time and used their own native weapons. In the fourth century the factories did mass-produce a new type of helmet of Parthian-Sāsānian origin, known as a ridge helmet, because it consisted of two metal halves held together by a central ridge. During this period, soldiers also received monetary allowances for the purchase of clothing, arms, and armor. By the late fourth century C.E., the army came to include increased numbers of barbarians who had little need for armor and therefore little desire to purchase it for regular use. Instead, soldiers relied primarily on large circular shields for protection. When an army was on the march, its armor was carried in wagons and was normally used only during an actual pitched battle.

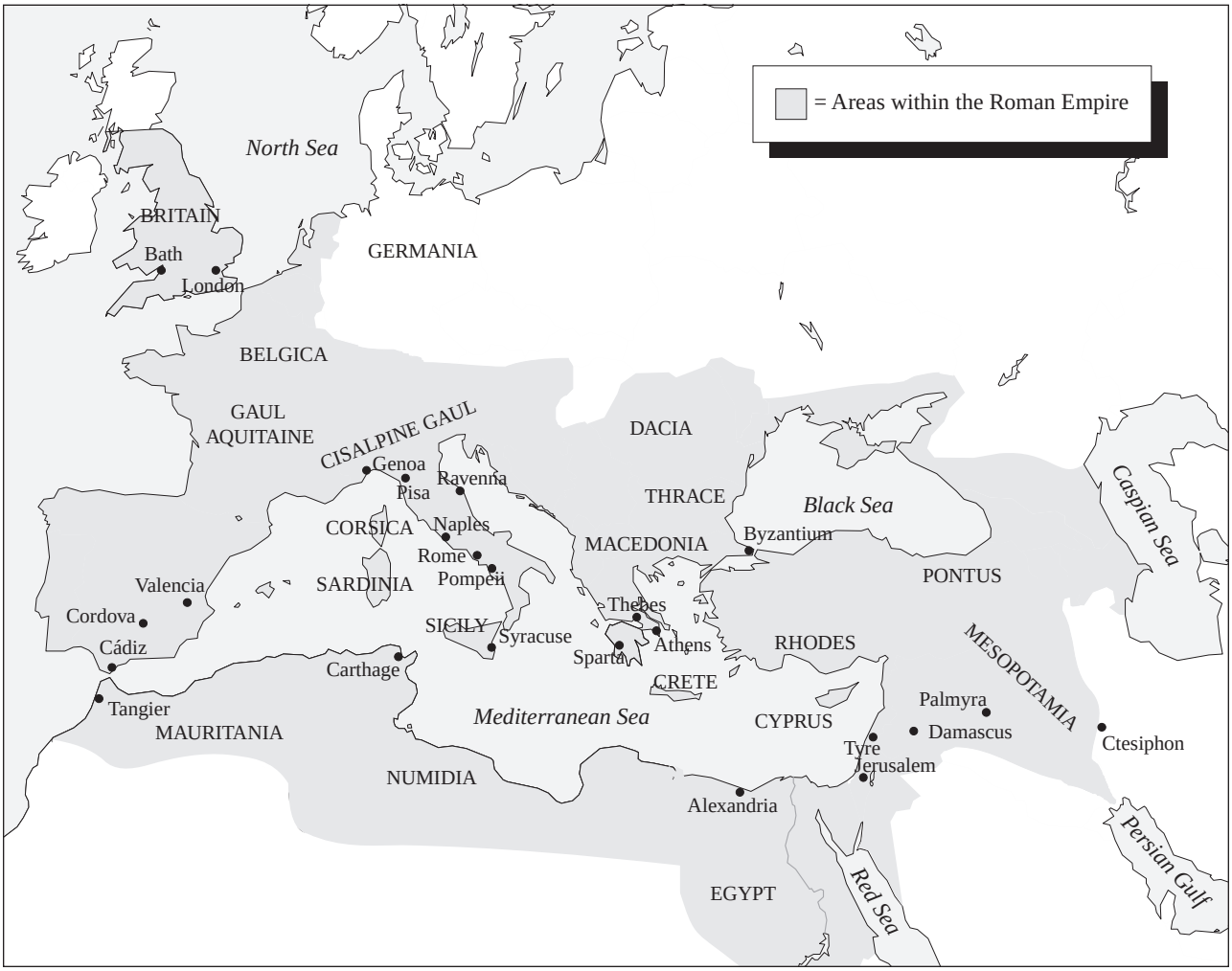
The Roman army also used various types of artillery both in battle and when conducting a siege. These included a device known as a *tormenta*, which fired arrows, javelins, and rocks, as well as larger *ballistae* and catapults that hurled larger arrows or stones.

MILITARY ORGANIZATION

During most of its history, the basic unit of the Roman army was the legion, which consisted only of Roman citizens and during the time of the early Empire numbered about 5,000 men. Each legion was organized into ten infantry cohorts, one of which consisted of five centuries of 160 men each, while the remaining nine cohorts were each composed of six centuries of 80 men each. The centuries were grouped into maniples, each consisting of two centuries. During the first to third centuries C.E., each legion also included a cavalry detachment of 120 men. The command structure of the legion consisted of the fifty-nine centurions, who commanded the centuries; five tribunes, each of whom commanded two cohorts; a prefect of the camp; a tribune of senatorial rank; and the legions' commanders, the legates.

The legions were supported by units known as auxilia, which consisted of troops recruited from subject peoples. These included infantry cohorts of 480 men divided into six centuries, and cavalry detachments (*alae*) consisting of sixteen troops (*turmae*) of thirty-two riders each. In the late first century C.E. these were enlarged to cohorts of ten centuries and alae composed of twenty-four turmae; the new

ROMAN EMPIRE, C. 117 C.E.



cohorts and alae each theoretically numbered 1,000 men but were actually somewhat smaller in number. There were also mixed units, known as *cohortes equitatae*, consisting of one infantry cohort and four troops of cavalry, and units known as *numeri*, which were not grouped as cohorts or alae but retained their own ethnic characteristics in terms of organization and weaponry. In addition to infantry and cavalry units, the auxilia included specialized troops such as archers and slingers.

The early imperial army also included certain elite units based in Rome. The most important of these was the Praetorian Guard, which was created by the emperor Augustus (63-14 B.C.E.) and originally consisted of nine cohorts. It supervised public life in the capital, escorted the emperor, and eventually came to play a major political role by occasionally helping to determine the succession to the imperial throne. The emperor was also protected by an elite personal cavalry unit known as the *equites singulares Augusti*. In the fourth century, the emperor Constantine the Great (c. 275 to 285-337 C.E.) disbanded both of these units because they had supported his rival Maxentius (died 312), and replaced them with a new bodyguard of German cavalry, the *scholae Palatinae*.

In the late second and third centuries C.E., the imperial army underwent some notable changes. The emperor Lucius Septimius Severus (146-211 C.E.) increased both the pay and the size of the army, adding new auxilia units as well as three new legions. One of these was stationed near Rome, serving as a reserve unit and ensuring that Severus remained in power. In 212 C.E. Severus's son, the emperor Caracalla (188-217 C.E.), extended Roman citizenship to most of the Empire's population; this action essentially ended the distinction between legions and auxilia. At the start of the third century crisis (235-284 C.E.), the Empire lacked reserve forces that could deal with invasions by German tribes. As a result, the emperors of this period formed reserve field armies that could readily respond to such invaders. The cavalry of the early imperial army were essentially light cavalry, but by the fourth century the army included two types of heavily armored cavalry, known as *cataphractarii* and *clibanarii*, which were modeled after Sarmatian and Persian cavalry respectively.

In the fourth century, Constantine the Great established a single large mobile field army known as the *comitatus*. This was led by two newly created officers, the *magister peditum*, who commanded the infantry, and the *magister equitum*, the commander of the cavalry. Constantine thus established a clear division between the field army and the frontier troops, the *limitanei*, who during this period were organized into legions of 1,000 men. However, due to the inability of this single field army to respond to simultaneous attacks on various parts of the frontier, Constantine's successors divided the comitatus into a number of regional field armies.

In the late fourth century, the Roman army faced mounting manpower shortages, which became particularly acute following a disastrous campaign against the Persians (363 C.E.) and a major defeat at Adrianople (378 C.E.). As a result, units of limitanei were transferred to the field armies. Moreover, the Romans permitted individual German tribes to settle within Roman territory as allies, or *foederati*, who were obliged to provide military service to the emperor. However, the field armies fell into decline, and individual military commanders and other wealthy individuals consequently organized private armies known as *bucellarii*, which continued to exist after the fall of the western Roman Empire in 476 C.E.

Turning Points

70 B.C.E.	The Romans besiege Jerusalem, taking the city's population captive and leveling its buildings to the ground.
9 C.E.	Roman legions are defeated by the Germans at the Battle of Teutoburg Forest.
73	The Romans employ ramps and siege towers in the Siege of Masada.
122	Construction of Hadrian's Wall begins in Britain.
c. 400	Cavalry replaces infantry as the most important element in Roman armies.
476	The weakened western Roman Empire finally falls.

Doctrine, Strategy, and Tactics

During the early imperial period Roman leaders believed that it was Rome's destiny to rule the entire world, a view that is reflected in book 6 of Virgil's (70-19 B.C.E.) *Aeneid* (c. 29-19 B.C.E.; English translation, 1553). However, during this same period they came to recognize major factors that limited further territorial expansion. One of these was the sometimes formidable resistance by enemies such as the Caledonians, the Germanic tribes, and the Parthians and Sāsānians. Moreover, some territories open to conquest, such as the Arabian deserts to the far southeast, were of little economic or strategic value. Finally, the empire simply did not possess the military manpower or resources to expand indefinitely. Augustus stationed most of the legions on the frontiers and recommended to his successors the basic strategy of defending Rome's existing frontiers rather than conquering additional territory.

Despite Augustus's recommendation, emperors of the first to third centuries C.E. did not completely abandon the policy of expansion. Notable examples of this policy can

be seen in the conquests of Britain, Dacia, and certain Middle Eastern territories, and in Septimius Severus's campaigns in Mesopotamia and northern Britain. In addition, Roman emperors and their generals sometimes carried out preemptive attacks or reprisals in order to eliminate potential threats to the Empire. However, for the most part Roman emperors developed and adhered to a strategy of defense of the Empire's frontiers. In doing so, they gradually established defensive zones, or limes, along the frontiers. The central feature of such zones was a military road running along the actual frontier. At various intervals along such roads the Romans built various defensive fortifications, including large legionary camps, smaller forts, watchtowers, and fortified ports along rivers. In the first and second centuries emperors sometimes implemented a policy of "forward defense," in which Roman forces took control of adjacent enemy territory and built roads, watchtowers, and forts in order to monitor enemy activity and discourage possible attack.

Sometimes the Romans built continuous defensive barriers in the limes in order to prevent barbarian entry into imperial territory as well as to define the Empire's actual boundaries. These include three barriers built in the second century: Hadrian's Wall and the Antonine Wall in northern Britain, as well as a 240-mile-long wooden palisade built to protect the strategic area between the upper Rhine and Danube Rivers. Such fortifications consisted of a ditch, an embankment, and a rampart, with smaller forts and military camps of varying size built at intervals along the wall. A military road was built along the entire wall for the purposes of communication and moving troops in the event of an enemy threat.

During the early imperial period, frontier provinces were guarded by armies composed either of legions and auxilia or simply of auxilia cavalry and infantry units. The northern frontiers consisted of three regions: northern Britain and the Rhine and Danube frontiers, each of which was threatened by warlike barbarian peoples. Rome's eastern provinces lacked natural geographical barriers and were therefore vulnerable to attack from the Parthians and, beginning in the third century, the Sāsānian Persians. During the reign of Augustus, the Rhine and North African frontiers were considered the most dangerous in the Empire. However, as these frontiers were stabilized, their garrisons were reduced, and those on the Danube and eastern frontiers were gradually increased during the first to third centuries.

During the third century crisis, frontier defenses collapsed and emperors consequently developed a new strategy of imperial defense. During this period Germanic tribes and Sāsānian armies frequently penetrated the limes and sometimes moved virtually at will within Roman territory. They sometimes posed a threat to cities located in interior areas away from the frontiers. The inhabitants of such cities consequently began to build defensive walls around them; in the late third century the emperor Aurelian (c. 215-275 C.E.) began construction of a wall around Rome itself. Moreover, third century emperors began to develop a strategy of "defense in depth," which featured less emphasis on frontier forces and greater use of mobile field armies that centered on heavy cavalry units. Such armies were stationed in cities away from the frontier and then sent to intercept and defeat invaders. Moreover, in an attempt to deal with a shortage of manpower, some barbarians (*laeti*) were allowed to settle in Roman territory and entrusted with defense of part of the frontier; they were also required to provide recruits for the army.

In the fourth century, Constantine the Great and his successors made increased use of mobile field armies. During this period, some emperors also attempted to strengthen the frontier defenses. Under Diocletian, frontier defenses were rebuilt, and new forts were built along the Danube and eastern frontiers and in North Africa. Valentinian I (321-375 C.E.) strengthened defenses on the Rhine and the Danube and directed preemptive attacks against barbarians along both frontiers. However, by the late fourth century the Empire was confronted with mounting manpower shortages as well as growing barbarian pressure on the frontiers. The manpower shortage resulted in understrength garrisons on the Rhine frontier being grouped together at a few vital points. In the fifth century C.E. Germanic invaders simply bypassed such strongpoints, which led to a complete collapse of the Rhine frontiers and, ultimately, to the end of the western Roman Empire.

Roman Empire, c. 400 c.e.

The principal tactical objectives of a Roman commander were to move his army safely and swiftly and ultimately to defeat the enemy in open battle. A Roman army was most vulnerable when on the march, and therefore it had to be arranged in an order of march that would enable it to deal effectively with an enemy attack. Moreover, army commanders had to provide maximum protection for the baggage train because if enemy forces captured it and began looting, soldiers might break ranks in order to retrieve their belongings and consequently place the entire army in peril. In order to ensure safe and rapid passage through enemy territory, Roman troops often built roads and bridges. Moreover, at the end of each day's march they built temporary marching camps for protection. These camps were surrounded by earthen ramparts and ditches and were disassembled the following morning before the army resumed its march.

When preparing for battle, Roman commanders sought to gather information about the enemy and to position the army in a manner best suited to the terrain on which it would fight. In battle, the Roman army was normally deployed in three parts, including a center or main body with flanking forces to its right and left that could be used to encircle the enemy. The legions were the most important component of the army. By the second century C.E. their basic battle formation was a solid phalanx consisting of several ranks of legionaries; however, the legion's subdivisions of cohorts, maniples, and centuries gave it great flexibility in battle.

A Roman army normally began a battle with an artillery salvo designed to demoralize and disrupt the enemy. Next archers and slingers fired on the enemy, and the infantry hurled javelins. This was followed by a great shout from the Roman lines that was intended to frighten the enemy. If the enemy then fled, the Roman cavalry was sent in pursuit; the advance cavalry units moved rapidly to make sure that the enemy retreat was not a tactical deception, while the remaining cavalry advanced carefully in battle formation. If the enemy attacked, the front ranks of the legions held firm while other ranks hurled javelins, and archers fired arrows upon the attackers; the cavalry was sent to meet any enemy flank attacks. However, if the Roman army made the initial move, it directed its attack against the weakest point in the enemy position. Auxilia units carried out the initial assault. They were followed by the legions, who advanced in a "tortoise," or *testudo*, formation, with their shields locked together in the front, at the sides, and overhead in order to protect the legionaries from enemy javelins or arrows. After the enemy position was broken, hand-to-hand combat followed until the enemy either surrendered or fled. If the enemy did flee, Roman troops first searched the immediate surroundings to avoid falling into an ambush, and then the cavalry was sent in pursuit of the enemy.

When conducting sieges of enemy fortresses or cities, Roman armies first set out to confine the enemy within their defenses by means of a series of fortified positions. The defenders were surrounded by a ditch and earthen rampart as well as a system of forts. Once this was constructed, the Romans set out to penetrate the enemy's defenses and force them to surrender. In some cases, as in the Siege of Masada (73 C.E.), the Romans built a high approach platform or ramp, which they would use to move a large siege tower close to the enemy wall. Archers positioned at the top of the tower could then fire on the defenders below; sometimes siege towers also were equipped with battering rams that were used to break through the enemy wall. Another method was to approach the enemy position under cover of a movable protective structure and then attempt to undermine the wall. If these methods did not work, the Romans would launch a frontal assault on the weakest point in the enemy defenses. This was preceded by a major artillery bombardment. The legionaries would then approach under cover of a testudo and scale the walls. After the top of the walls was secured, enemy cities were then sacked.

During the late imperial period, Roman warfare changed considerably. By the fourth century, most military action consisted of small-scale skirmishes involving small detachments of troops. However, in large-scale battles Roman commanders still sought to defeat barbarians such as the Goths by means of a decisive infantry clash in which the Roman infantry was deployed in a phalanx formation. When the enemy approached, they came under fire from archers

deployed behind the phalanx; this might slow or even halt the enemy advance. If it did not, both sides would shout a battle cry, or *barritus*, and the enemy would resume their advance. The Roman archery fire continued, while Roman infantrymen in the rear ranks hurled their javelins and moved forward to support the troops in the front ranks. After the enemy made contact with the Roman phalanx, the two sides pressed upon each other until one side lost heart and gave way. The cavalry then pursued the soldiers of the defeated army; it was in this last stage of battle that the largest number of casualties were inflicted.

Roman infantry employed the same tactics against enemy cavalry attacks. However, such attacks were relatively rare since it was difficult for cavalrymen to make their horses charge up against tightly packed infantry positions. If the infantry held firm, they could easily repel such attacks.

During the fifth century C.E., cavalry replaced infantry as the most important element in Roman armies. They generally used one of two different attack formations: a wedge, or rhomboid, formation, which was effective when carrying out elaborate maneuvers or seeking to pierce enemy formations, and a square, or oblong, formation, which was used when carrying out a full-scale charge. During the late imperial period, Roman cavalry used both skirmishing and shock tactics. In the former, the cavalry rode up to an enemy formation and fired their arrows; if the enemy held firm, they would fall back and attack again. If the enemy broke ranks, they then charged and engaged in close combat. *Foederati* and other German cavalry in the late Roman army used shock tactics in which they simply charged, sometimes with the support of mounted archers, and attempted to defeat the enemy in close combat.

ANCIENT SOURCES

The noted Roman historian Cornelius Tacitus (c. 56-120 C.E.) wrote a number of works that offer valuable insights into early imperial warfare. These include a biography of his father-in-law, a governor of Britain, that describes Rome's military campaigns in that province. Tacitus also wrote *Ab Excessu Divi Augusti*, also known as *Annales* (c. 116 C.E.; *Annals*, 1598), an account of events in the Empire in the period from 14 to 68 C.E., and the *Historiae* (c. 109; *Histories*, 1731) on the period from 68 to 96 C.E., of which only the portions on the period from 69 to 70 C.E. have survived. The Jewish historian Flavius Josephus (c. 37-c. 100 C.E.) wrote a history of the Jewish revolt of 66-70, which includes descriptions of the Roman army in action.

Arrian (c. 89-155 C.E.), a governor of Cappadocia under the emperor Hadrian, wrote a first-hand account of a campaign that he conducted against the Alani in 134. He also wrote the *Ars Tactica*, a manual on the training of cavalry. Pseudo-Hyginus, an obscure figure who probably lived during the second century C.E., wrote *De Munitionibus Castrorum* (second century C.E.; *Fortifications of the Camp*, 1993), a discussion of the planning and construction of Roman military camps. The fifth century Roman military theorist Flavius Vegetius Renatus wrote *De Re Militari* (383-450 C.E.; *The Fovre Bookes of Flauius Vegetius Renatus: Briefelye Contayninge a Plaine Forme and Perfect Knowledge of Martiall Policye, Feates of Chiualrie, and Vvhatsoeuver Pertayneth to Warre*, 1572; also translated as *Military Institutions of Vegetius*, 1767), a treatise in which he called for a restoration of traditional military drill and training, and in doing so discussed various aspects of the Roman army in earlier periods.

Ammianus Marcellinus (c. 330-395 C.E.), an officer who served in the Roman army in the 350's and 360's, wrote a history of the Roman Empire that continued Tacitus's account from 96 to 378 C.E. However, only the books on the period from 353 to 378 C.E. have survived; these are a major source for political and military events of this period. The *Notitia Dignitatum* (c. 395 C.E.) is an illustrated manuscript that lists the officers of the late fourth century army, as well as their units and where each was stationed.

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Thomas I. Crimando

Celtic Warfare

Dates: c. 500 B.C.E.-900 C.E.

Political Considerations

If any word is symbolic of the Celtic culture, it is "periphery." By the fifth century B.C.E., while civilizations battled for position along the Mediterranean basin, one rising civilization to the north stood apart. Hugging the fertile lands on the northern side of the Alps, the Celts flourished. Though lacking a centralized authority or literacy, the militant Celts spread. Power centers clustered around chieftains in defensive hill forts developed into *oppida*, or settlements, and the Celts expanded. They were known for their splendid vessels, jewelry, weapons, and armor, and the fine metalwork of Celtic craftspeople became the basis for trade routes that spread throughout Europe, even to Carthage. Although their expansion north was limited by Germanic tribes, at the height of their expansion the Celts' territory in the east included areas of modern Atlantic Spain, France, and, by the first century B.C.E., England and Ireland. In the west, much of the area north of the Balkan Mountains, and even a tenuous colony in what is now Turkey, was under their control.

North Wind Picture Archives via AP Images

A Celt depicted in battle with a Roman on the column of Roman emperor Antoninus.

The Celts' lack of a centralized authority, combined with some chieftains' lust for Roman luxuries, led to their downfall. They were expelled from Italy by 191 B.C.E., and Julius Caesar utilized fear of the Gauls to launch an invasion into Gaul in 58 B.C.E. The area was pacified by 51 B.C.E. Although Caesar had made punitive expeditions into Britain in 55 B.C.E., it was not until 43 B.C.E. that Rome reached its farthest conquest in Britain. As further expansion was not profitable for Rome, a wall was built in 121 C.E. under the direction of the Roman general Hadrian to minimize the attacks of the Celtic Picts. Ireland, meanwhile, was largely ignored, allowing the Celtic culture to thrive there. Although Rome may have leveled the hill forts, traces of Celtic culture remained among the Britons. This culture, once converted to Christianity, replaced militaristic fervor with the fervor to convert. Thus a culture turned a geographic characteristic

CELTIC EUROPE, 60 B.C.E.

into something that allowed its survival: specifically, the periphery.

MILITARY ACHIEVEMENT

Although the Celts' expansion was a necessity for the acquisition of more farmland, it also led them into conflict with growing powers. Their military expansion allowed them to build a massive breadth of empire. Early victories staved off encroachment on Celtic lands by Mediterranean civilizations. However, the Celts were almost victims of their own success; their lack of unified organization led to a slow defeat and retreat of lands.

Early Celtic victories began around 400 B.C.E. The Celts had pushed into the Po Valley. The Etruscans called for Roman emissaries, but the Celts felt the Romans took the Etruscan side and, in 387 B.C.E., declared war on Rome. They subsequently sacked Rome and left the city only after a huge ransom was paid, a slight that Rome never forgot.

Less than one hundred years later, the Celts raided Thrace and Macedonia from 298 to 278 B.C.E. They threatened Delphi. This invasion and final repulsion were likened by contemporary Greek historians to a

victory rivaling that against the Persian king Xerxes almost two hundred years earlier. Celtic plundering, however, continued until 212 B.C.E.

In Spain, the Celtiberians conflicted with Carthage beginning in 237 B.C.E. By the Second Punic War (218-201 B.C.E.), they served as mercenaries for Carthage. The Celts, who had lost land to Rome in 225 B.C.E., fought and then supported Hannibal's army in 218 B.C.E.

With Carthage defeated, Rome moved against the Celts. Julius Caesar invaded Gaul in 58-54 B.C.E. After a rebellion led by Vercingetorix in 52 B.C.E., this was the zenith of Celtic power in Gaul. By 51 B.C.E., Gaul had been pacified. Britain was invaded in 47 B.C.E. Total resistance to Rome in the Po Valley remained until 49 B.C.E. In Spain, military resistance ended in 19 B.C.E. Although some Celtic pockets survived—in Ireland, Brittany, Wales, and Scotland—the lack of a centralizing unity and threats from Vikings weakened the culture.

WEAPONS, UNIFORMS, AND ARMOR

It was the iron of the Celts that allowed their incredible expansion. Once Celtic societies became proficient at the smelting of iron, the Celts rose to proficiency with the metal. The main weapon of the soldier was his iron sword, complemented by a spear. These were quite ferocious weapons, as pointed out in the first century B.C.E. by Roman historian Diodorus Siculus:

> Their swords are as long as the javelins of other peoples and their javelins have points longer than their swords. . . . Some of their javelins . . . are forged . . . so that the blow not only cuts but also tears the flesh, and the recovery of the spear tears open the wound.

Although bows, slings, and throwing clubs were also used, they were not typical. Celts were also highly regarded in their use of war chariots and cavalry.

For armor, the main item used was a shield. Most shields were made of leather and wood, although bronze ornamentation was sometimes added. In battle, many Celts wore bronze helmets and neck rings, or torcs. Although some Celts entered battle wearing tunics made of iron chain mail, the majority of Celts fought naked. The reasons for this nakedness are unknown, but it is believed to have been part of some ritual.

MILITARY ORGANIZATION

The Celtic culture was centered on the military. Indeed, the Greek geographer Strabo described the whole Celtic nation as "war-mad" and "quick for battle." He went on to state that the Celts "tend to rush to war all together, without concealment or forward planning," and "They are willing to risk everything they have with nothing to rely on other than their sheer physical strength and courage." War was necessary, for the Celts maintained a social structure based on the warrior elite; during boastful feasts, the warriors would regale one another with their exploits, seeking increased social position.

Celtic warfare had its own unique aspects—headhunting, for example, and a reliance on the reckless headlong charge to break an enemy line. Warriors fought for personal glory. In this quest for glory for the individual warrior, formal discipline was nonexistent, but the tactic worked often enough to justify the Celts' faith in it. Indeed, one last item that set the Celts apart was the willingness of their women to engage in battle. Roman historian Ammianus Marcellinus wrote the following in the fourth century C.E., on observations of the Celts during 63 B.C.E.-14 C.E.:

> A whole troupe of foreigners would not be able to withstand a single Gaul if he called his wife to his assistance who is usually very strong . . . and . . . she begins to strike blows mingled with kicks, as if they were so many missiles sent from the string of a catapult.

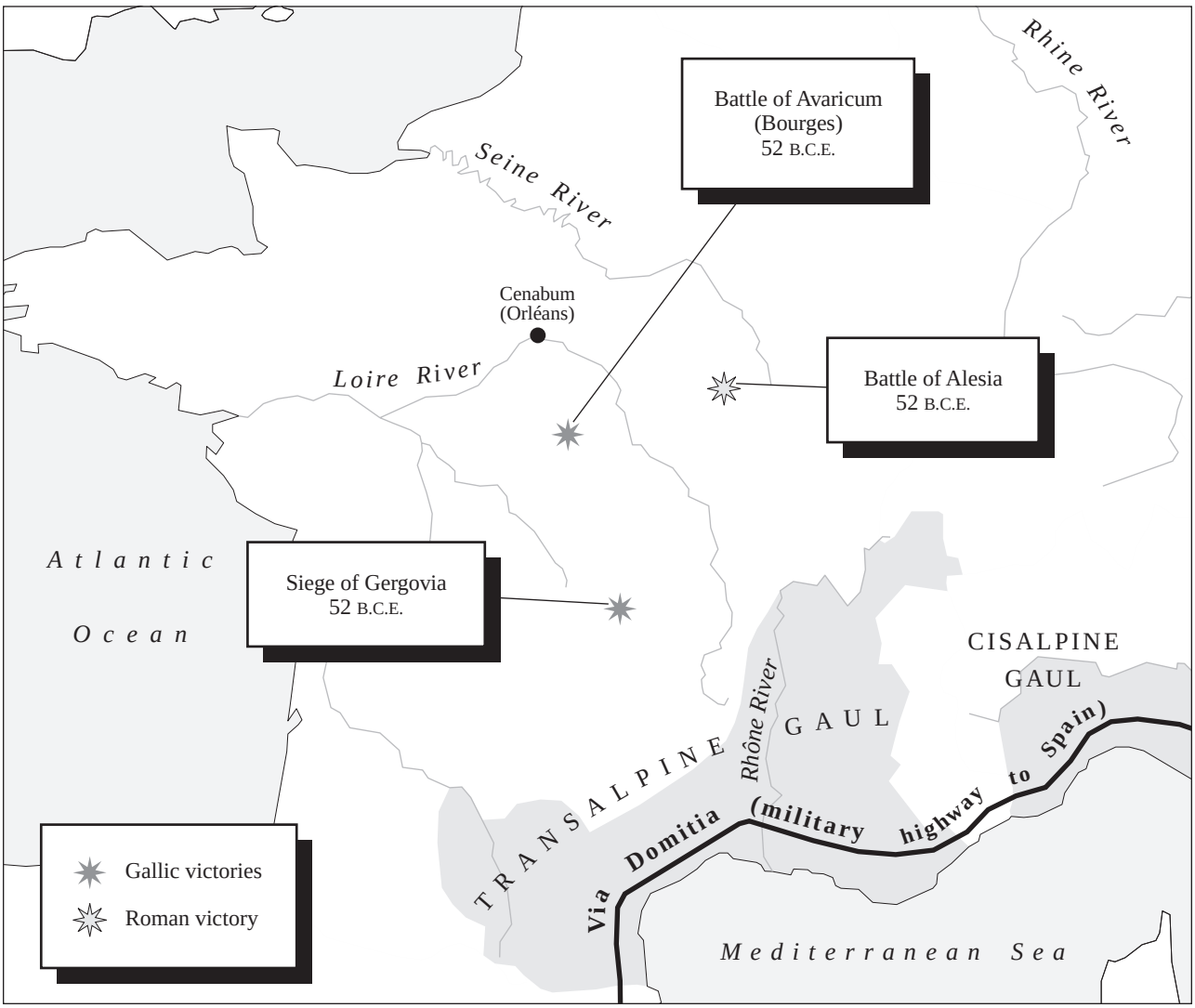
DOCTRINE, STRATEGY, AND TACTICS

The warrior code of personal glory and victory seemed to define much of the Celtic doctrine in battle. Victory at any price, any cost, seemed to be the almost manic approach of many Celts in battle.

Much of the strategy used by the Celts in battle centered on psychological warfare. Before fighting began, the Celts would cry out their victory and prowess in battle while demeaning those who stood against them. The naked warriors, sometimes covered in war paint, would all shout at once, creating a cacophony that unsettled enemies who were used to noises having some type of significant purpose in battle.

The Celts' most common tactic in battle, a ferocious headlong assault that was almost blind in its fury, unnerved many a foe. Although the emphasis on the individual in the Celtic army prevented coordinated action, the unpredictability of the Celts' seemingly deranged attacks prevented a strong defense. This form of frontal assault, combined with the armaments of sword and shield, was able to deal effectively with Mediterranean armies organized on the model of the Macedonian phalanx. The Celts also used cavalry, and they gained notoriety for their skill with horses. By the second century B.C.E., however, their use of the war chariot dropped off in continental Europe.

FINAL ROMAN CAMPAIGN AGAINST GALLIC TRIBES, 52 B.C.E.



ANCIENT SOURCES

A difficulty arises when one consults ancient sources for information on the Celts. Because the Celts did not develop a written language of their own, all writing concerning them was left by those who fought against them, and readers should thus be aware of possible bias in these accounts. Of all the authors to address the Celts, perhaps the most famous and readable ancient source is Julius Caesar. His work on the conquest of Gaul, *Comentarii de bello Gallico* (52-51 B.C.E.; *The Gallic Wars*, in his *Commentaries*, 1609), is a document written by an ambitious general to build his own personal power and esteem. Of the various other authors who wrote about the Celts, from Greek to Roman, their actual exposure to the Celts was limited. Authors ranging from Athenaeus (fl. c. 200 C.E.) to Diodorus Siculus (c. 80-c. 20 B.C.E.) and Strabo (64 or 63 B.C.E.-after 23 C.E.) relied on sensational and fantastic stories to build the mystery of a culture that was completely foreign to them, a culture that had threatened and struck fear into both civilizations.

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Andrew Reynolds Galloway

Berber Warfare

Dates: c. 1000 B.C.E.-1000 C.E.

Political Considerations

The term "Berber" was first coined by foreign conquerors in an attempt to classify a large population who resided in the Maghreb region of North Africa. Some scholars believe that "Imazighen" was the self-referential term. The exact identification of who constituted the Berber people during this period becomes difficult to determine given the wide use of this appellation and the complicated ancestry of those it attempts to describe. In the words of one of the foremost modern Berber scholars, Elizabeth Fentress, "at best we can define Berbers as Mediterranean." The term "Berber" is also used to refer to the Afro-Asiatic language group, with its many variants and dialects. At one point this language group constituted one of the major forms of verbal communication in North Africa.

The Berber population was not contained in one nation and was embroiled in numerous intertribal and international conflicts. Throughout the period from 1000 B.C.E. to 1000 C.E., Berber tribes, kingdoms, and mercenaries were both allies and enemies of Carthage and Rome, the Muslim invaders, and each other. To confuse the situation further, this duality was common during the major military conflicts. Sorting through this tangle can be daunting, but the task is made easier if it is understood that the term "Berber," when applied in a historical context, may refer to just a single kingdom, tribe, or mercenary band rather than to an entire population. The varied political situations that erupted into warfare led directly to the Berbers' identity as warriors.

Military Achievement

The Berbers' actions on hundreds of battlefields across the ancient world, from the coasts of North Africa to Italy and Spain, earned them a reputation as accomplished and fierce fighters. Both Carthage and Rome courted Berbers during their long feud, drawing them into all three of the Punic Wars. Berbers again were a serious political and military consideration during the Vandal conquest and occupation of North Africa. Berber cavalry and infantry formed the backbone of resistance during the Muslim invasion of North Africa in the seventh century C.E. as well as alternately serving as a conquering force for Islam.

As the Berber population was not contained in one nation and was embroiled in numerous intertribal and international conflicts, only a summation of some of the most important engagements follows. The Berber kingdoms of Numidia (present-day Algeria and part of Tunisia) allied with the North African Phoenician city of Carthage (formed c. 814 B.C.E.). During the First Punic War (264-241 B.C.E.), Numidian soldiers and cavalry were in the ranks of the Carthaginian armies allied against Rome and its forces. Berber soldiers made up a large element of the discontent during the Revolt of the Mercenaries (241-238 B.C.E.), which was sparked over payment issues stemming from the First Punic War.

During the Second Punic War (218-201 B.C.E.), Masinissa, the chief of the Massyli tribe in Numidia, formed an alliance with Carthage against Rome. He commanded cavalry against Rome on a battlefield in Spain. In 206 B.C.E., however, he switched sides, allying with Rome in exchange for larger territory. At the climactic Battle of Zama (202 B.C.E.), Masinissa's cavalry was a decisive factor in the crushing Carthage defeat. In 151 B.C.E., open warfare broke out between Numidia and Carthage, ending in defeat for Carthage. Sensing weakness, Rome initiated the Third Punic War (149-146 B.C.E.). Once again, Numidian cavalry were part of the army that leveled Carthage in the final year of that war.

A descendant of Masinissa, Jugurtha, fought alongside Scipio Africanus the Younger in the Spanish siege of Numantia. In an attempt to consolidate his kingdom, Jugurtha attacked another Numidian king in 118 B.C.E., who sought and was granted Roman aid. The end result was the execution of Jugurtha in 105 B.C.E.

In 429 C.E. the Vandals crossed the Strait of Gibraltar into North Africa on a mission of conquest. Once again, Berbers assisted and repelled this latest foreign incursion, and they weathered the Vandal occupation until that empire's ultimate decline. Striking out from conquered Egypt, Muslims clashed with Berbers between 642 and 669 C.E. Although there remained pockets of resistance, the majority of the Berber population converted to Islam. It is estimated that eighty thousand Berbers fought on behalf of the Muslims at the Battle of Poitiers/Tours in 732 C.E. This would become the foundation for the Islamic empires of the Almoravids and Almohads of the later centuries.

WEAPONS, UNIFORMS, AND ARMOR

Perhaps the most effective weapon in the Berber arsenal was the horse. It is estimated that this living weapon of war was introduced to the Berber homeland around 1200 B.C.E. The Berber warriors quickly evolved into highly skilled horsemen. The Berber Garamantes, in the period predating the Roman excursions in North Africa, were noted as using horse chariots. These seem to have been used for purposes of shock and awe, as archery platforms, or perhaps as status symbols. Later accounts do not mention these chariots in use.

According to accounts left by their opponents, the Berber horsemen rode bareback (although it is likely they used saddlecloths). There was also amazement that the Berbers seemed to guide their horses without reins; in fact, they utilized the *bozal*, a rope or leather bridle to which a lead-rein is attached with a metal bit. The ability of the Berbers to marshal massive numbers of mounts was considered extraordinary. According to a report from Greek geographer Strabo, "Horse-breeding is followed with such exceptional interest by the [Berber] kings that the number of colts every year amounts to one hundred thousand."

Of course the horse was simply the conveyance for the warrior, who had to exploit the opportunity provided by his steed. The preferred missile weapon of the Berbers was the broad-bladed javelin, usually cut to a length of five feet. A short sword, often appropriated from a fallen Roman foe, was generally carried as a secondary offensive weapon and a defensive measure against other cavalry blades. Historical documentation also cites Berber horsemen equipped with short spears. Berber infantrymen were similarly armed with spears, swords, javelins, and the occasional bow.

For protection, a small, rounded leather shield was carried into battle, although in the later medieval period this was replaced with a much larger shield made from the hide of a kind of antelope known as the *lamt*. While larger, the lamt shield remained light. According to tradition, the lamt hide was cured in milk, and the shield was so effective that a saber blow would rebound or become stuck, while arrow holes tended to make only insignificant impressions in the thick surface.

As Berber troops hailed from various tribes rather than a single nation and were often employed as mercenary auxiliaries, there is no single distinctive Berber uniform from this period. It is probable that Berber warriors simply wore their "civilian" garb in battle, which often consisted of a goat-skin cloak and long, flowing unbelted tunics. Another distinctive article of clothing associated with the Berber is the hooded cloak called the *burnus*, which may have been inspired by the Roman legionnaire garment, the *sagum*. Berber warriors with exposed heads could be identified on the battlefield through another means: An ancient tribal custom, practiced into the medieval period, was to shave part of the head before going into battle.

MILITARY ORGANIZATION

Berber gatherings began at the level of the *ikhs*, a group of extended family headed by the eldest male member. The population of a Berber village often included several of these groups, and a Berber tribe

comprised a dozen or more villages in a defined geographic area. The smaller of the tribes remained under the familiar system of elder rule, whereas the larger tribes spawned monarchs, some of which were led by kings with dynastic ambitions.

In times of need, warring Berber tribes would put aside their differences and muster into a coalition called a *leff* or *soff*. Such coalitions had political considerations; members pledged offensive assistance to other members or promised aid in defense against rival leffs.

The two most significant early Berber kingdoms were Numidia (present-day Algeria and part of Tunisia) and Mauritania (near present-day Algeria and Morocco). The kings of Numidia and Mauritania raised armies of slaves, freemen, and mercenaries through the time-proven system of taxation. Also in these kingdoms, an aristocratic class developed. Similar to medieval knights, the men of this highborn class became the elite cavalry. The kings could call their tribal subjects to their banners, but the subjects' availability to serve was hindered by agricultural considerations, such as harvesting and sowing. Ultimately, the kingdoms of Numidia and Mauritania were both destroyed by Roman imperial designs.

During the third century, under Emperor Diocletian's reforms, the Romans made a concerted effort to assimilate Berber forces into the Roman military machine. Large numbers of Berbers served with the Romans as *foederati*, semiautonomous allies. The Berber cavalrymen were arranged into relatively vaguely defined squadrons rather than into precise unit designations. These squadrons were led by the Berbers' own leaders, who were then overseen by the Roman generals, who commanded them on the field and on the march. This seems to have been the system typically used when large groups of Berbers were employed as mercenaries.

Doctrine, Strategy, and Tactics

Berber military doctrine remained fairly consistent during this period. There was a marked preference for ambush and guerrilla-style hit-and-run strikes over complex, large-scale maneuvers or siege warfare. Generally, the Berber troops were lightly armored and equipped and were extremely mobile. Roman opinion of the Berber warriors was that they were fierce and swift, but they were also unreliable and poorly armed.

Berbers were experts in guerrilla warfare against larger, better-equipped foes. The favored stratagem was to lead the enemy forces into an ambush on favorable ground by means of feigned retreat, then, once they arrived at a prearranged fixed position, spring the trap. A reserve, usually mounted, would often be kept at a distance and would then surge forward to envelop the enemy from all directions.

Mounts, such as horses, remained an important element in the Berbers' military operations. David Nicolle, a scholar of Berber warfare, gives an illuminating example of Berber ingenuity:

> In the later centuries, with a greater use of camels, the eastern Berber tribes would make these beasts kneel in a big circle as a barrier against cavalry, whose horses tended to fear the camels. Other animals could also be roped together as an inner barrier, while calthrops were scattered outside. Some warriors defended the living perimeter using spears as pikes, while javelin throwers stood between the camels. The best cavalry took up position some way away.

Ancient Sources

Strabo, the Greek geographer and historian, wrote of the Berber society in his seventeen-volume *Geōgraphica* (c. 7 B.C.E.; *Geography*, 1917-1933). Book 5 of Pliny the Elder's *Naturalis historia* (77 C.E.; *The Historie of the World*, 1601; better known as *Natural History*) contains a valuable cache of information about North Africa and Carthage. Sallust, one of the most shameless pillagers of North Africa, wrote the monographs *I bellum catilinae* (c. 42 B.C.E.; *The Conspiracy of Catilline*, 1608) and *Bellum iugurthinum* (c. 40 B.C.E.; *The Jugurtha War*, 1608), which shed light on this little-known historical event. Appian's *Romaica* (second cen-

tury C.E.; history of Rome) contains information on the Second and Third Punic Wars and an appendix, which has survived only in part, on the Numidian War. Some information on Berber culture is also contained in the fifth century B.C.E. works of the preeminent classical scholar Herodotus. A book commonly attributed to Julius Caesar, but likely written by another Roman officer, titled *De bello Africo* (49-45 B.C.E.; *Commentaries of the African War*, 1753), deals with the battle between Caesar and Pompey in North Africa and provides details on the role of King Juba of Numidia and the Battle of Thapsus in 46 B.C.E. A fifth century bishop, Victor of Vita, in the small North African province of Byzacene, left behind his work *Historia persecutionis Vandalorum* (fifth century C.E.; *The Memorable and Tragical History, of the Persecution in Africke*, 1605), a rare eyewitness account.

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Michael Coker

Tribal Warfare in Central and Eastern Europe

Dates: c. 500 B.C.E.-800 C.E.

Political Considerations

The tribes in central and eastern Europe that fought against the Roman Empire for the most part preserved their independence, and from the fifth century C.E., the combined effect of these tribes was to bring about the destruction of the Roman Empire of the West and also to weaken severely the Roman Empire of the East, making it far more susceptible to attack from the Turks, which led to its own military and then political decline. Prior to their defeat of the Romans, the tribes served to unite the Romans, who feared them greatly. The fact that the tribesmen were victorious against Roman armies in battle spread panic and terror to many Roman households, and this led many Roman generals to try to establish their political reputations through fighting against the German tribes. Although the tribes moved, by the fourth century C.E. the Vandals were between the Viadua and the Vistula rivers, the Visigoths were in modern-day Romania, north of the Danube, the Ostrogoths were in southern modern-day Ukraine, and the Huns were further east.

Military Achievement

The Germanic tribes, as well as the Goths and Huns, transformed warfare during the first five centuries C.E., managing to defeat significant strong and well-equipped Roman armies by using their superior mobility in traveling to and also on the battlefield. This allowed a number of tribes to overwhelm and defeat Roman forces many times, the first major occasion being at the Battle of the Teutoburg Forest in 9 C.E., when a Germanic force wiped out three Roman legions. This defeat ended any serious attempt by the Romans to annex Germany or to get supportive tribes to form into a pro-Roman German confederation.

The tribes often combined in their military efforts, and gradually, with the decline of the central power in Rome, they conducted incursions into Roman territory. This continued through to the Battle of Adrianople in 378 C.E., when a Gothic army, using similar tactics, managed to destroy the forty-thousand-strong Roman army of the Emperor Valens in a confrontation some 150 miles northwest of Constantinople. The defeat led to a transformation of Roman military tactics, with the Romans starting to rely much more heavily on cavalry. Even with such changes, however, the Romans were still encountering major problems. In 451 C.E., the Roman emperor Aetius managed to ally with the Visigoths and defeat the Hun army of Attila at the Battle of the Catalaunian Plains, near Châlons, in modern-day France, but although they carried the day on the battlefield, the Romans were unable to drive home their victory, and Attila continued to pose a major threat to his adversaries until his death two years later.

The Germanic tribes formed a large, mobile military force that swept through areas of northern Europe in a way quite unlike that of armies before them. Instead of being solely a force of soldiers, the tribes brought with them their women and children; they formed vast convoys of wagons, chariots, horsemen, and people traveling on foot. By night they would draw their wagons together in a ringed or stockade fashion called a *Wagenburg* to provide the necessary defense for all the tribespeople; in battle they established similar formations. The Romans noted that during their battles with some of the Germanic tribes, the tribes' women and children would bang drums and gongs from within the stockade, both to inspire their own soldiers and to frighten those of the other side.

It was under Julius Caesar, during his wars in Gaul in 58-51 B.C.E., that the Romans first came to notice the strong fighting spirit of the German tribes. Caesar, who was much more adaptable than most of his contemporaries, and many of his Roman predecessors, in accommodating his fighting style to the terrain, immediately saw the value of the Germans. While the Romans relied heavily on the mass formations of their infantry—the legions attacking slowly and steadily—Caesar noticed the effectiveness of the Germans' style of attacking a single point in their opponents' battle line in a lightning charge. This led Caesar to start using Germans in his own army, and they served to good effect against the Gauls.

The Romans continued using large numbers of non-Romans as auxiliaries in their armies, and eventually the Roman cavalry was largely made up of these auxiliaries, recruited often from areas outside the empire itself. As a result, by the third century C.E. large numbers of Goths were serving as cavalry in the Roman forces, and by the late fourth century, many Roman cavalry units were made up entirely of Goths. This incorporation of Goths into the Roman army helped to alleviate the Roman weakness in lack of cavalry in many battles, but because many of the Roman generals were seriously worried about the loyalty of these cavalry units, they occasionally did not use the units to best effect.

It was the Goths' crushing defeat of Emperor Valens at the Battle of Adrianople in 378 C.E. that signaled a major change in the nature of the battles fought by the Byzantines. Until then they had, like their predecessors, relied heavily on tight infantry formations, but they saw that they had to change and incorporate large numbers of cavalry, especially heavy cavalry, into their armies. It was not long before the heavy cavalry came to constitute a substantial part of the Byzantine forces—the cavalry being formed from their own soldiers, not just those of their allies, as had been the case for centuries before.

Although the Byzantines adapted, the Roman armies of the Western Empire did not do so, and this meant that the western Romans often had to ally with potential enemies, such as King Theodoric I of the Visigoths, who fought alongside the Roman emperor Aetius in 451 in the Battle of the Catalaunian Plains. This battle against the Huns saw the infantry essentially as spectators, with the fighting being done by large cavalry units, and it was the cavalry charge by Attila that nearly carried the day and did result in the death of Theodoric. However, the Huns were outnumbered and forced to withdraw with heavy losses, giving eventual victory to the Romans and Visigoths. With each of the victors worried about the other gaining too much of a military advantage, the victory was not pressed, and Attila was able to lead the rest of his forces away and continue over the next two years to harry his opponents.

Although the Romans and the Visigoths formed an alliance, in 410 the Visigoths had managed to invade Italy and sack Rome under King Alaric I, and in 455, Genseric, king of the Vandals, also managed to sack Rome. Rome had barely recovered when it was sacked again in 546 by Totila, king of the Ostrogoths; this assault led to a major decline in stature from which the city did not begin to recover until more than one thousand years later with the increase in papal authority.

WEAPONS, UNIFORMS, AND ARMOR

Significant advances were made in weaponry during the tribal warfare that took place from the fourth century B.C.E. to the eighth century C.E. Throughout this period, the use of cavalry and also light infantry dramatically transformed the fighting, and as a result the emphasis started to be very much on minimal heavy weapons, strong morale, and weapons that were effective against Roman infantry.

The shields that the tribes carried in battle tended to be round—in contrast to both the rectangular curved shields of the Romans and the rectangular or nearly rectangular ones used by many of the Gauls. That said, some rectangular shields of the period have been recovered from burial sites and peat bogs in modern-day Germany and Denmark. The major difference between the Germanic shield and the Roman one was that the Germanic shield was specifically designed to be light, and it was used largely for deflecting opponents' weapons; the Roman shield, or

Domains of European Tribes, c. 500 c.e.

scutum, in contrast, could be used to cover most of the parts of the body. The Germanic shield also had on it a metal protuberance known as a boss, which was used in charging at Roman lines.

As the Germanic soldiers had to move quickly, their armor was much more limited than that used by the Romans, often being made from leather rather than metal or consisting of iron plates rather than the breastplates so commonly worn by the Romans. Of the tribes, the Visigoths are thought to be the major group that gradually adapted to use heavier armor, and this was often when they were fighting as allies of the Romans. Germanic chiefs did wear some armor, but few of their ordinary soldiers did so—in fact, some went into battle naked to show their strength and prowess. Archaeologists, however, have discovered some mail armor from 200 B.C.E. in a peat bog in modern-day Denmark, and many helmets have survived from the Germanic soldiers—these being used, it would seem, as much to designate rank as for protection in battle.

The great advantages of the Germanic and Gothic

infantry lay in both where the soldiers could strike on a battlefield and their strength as individual warriors. They trained extensively in the use of the large sword and axes, which were usually swung at their opponents rather than used to thrust or stab, the traditional Roman fighting styles. Most often the swords and battle-axes were used one-handed; little archaeological evidence exists of the use of the larger two-handed sword of medieval Europe. Many of these soldiers would also be armed with several spears, which they would generally throw before engaging the enemy, a process that gradually led to their using Roman-style javelins with great effect.

The cavalry were also armed with spears or lances, and it was not unknown for soldiers to ride into battle with a number of spears that they threw at the ranks of their opponents prior to charging the enemy lines with their horses. Caesar praised the use of the cavalry by the Germans and went as far as recruiting many of them to complement his forces; these soldiers were armed with lances or javelins and also two-edged slashing swords.

For most of the tribes, the horses themselves were generally unprotected, even though they served very much as part of the attack, the horses being flung against the tight formations of Roman infantry. Like the infantry, as the emphasis was very much on suddenness of attack and the advantage of mobility, the cavalry of the Germanic and Gothic tribes tended not to be heavily armored. In later battles against the Byzantines, however—especially after the Byzantines themselves started deploying heavy cavalry—the Germanic tribes began using horse armor.

North Wind Picture Archives via AP Images

A German warrior shown with a Roman general.

MILITARY ORGANIZATION

The full nature of the military organization of the tribes that formed the Germanic, Gothic, Visigothic, Lombard, and Hun forces is not known with any degree of certainty. This is because the only descriptions of the tribes' armies that are available come from Romans who saw masses of people attacking their soldiers and were generally unable to discern how the individual units of their opponents worked. Obviously, the sheer numbers of tribal peoples who were able to be mustered at short notice to fight the Romans, and also presumably each other, indicate that there had to have been a sophisticated method of recruitment, training, and deployment. It is also probable that the system of government of the tribes underwent change and development during this long period—as it did in Rome and other places that are well documented.

The surviving evidence suggests that the method used by the German tribes was not dissimilar to that utilized by the Anglo-Saxons in early medieval England, about which much more information is available. The Romans described the overall ruler of a Germanic tribe as a "king," but that probably reflects their interpretation of a supreme ruler. It is possible that the position of ruler was hereditary in some areas and for some periods of time, but the concept of di-

rect succession of father to son over a long period of time seems unlikely given the evidence to the contrary.

The "king"—the historian Tacitus uses the term *rex*—was therefore probably a chief who was elected from a meeting of the chiefs, and he ruled, and led his soldiers in battle, during his period in office, which could be for life, although some rulers were overthrown. The power of this chief therefore rested on his prestige, his personality, and his ability to persuade others. Even on a battlefield his orders were not necessarily routinely obeyed, although generally they were, as the soldiers were fighting for a common purpose. Under the supreme chief there were local chiefs and also village chiefs.

For the raising of armies, and also for administration and the collection of taxes, the villages were combined administratively into a grouping called a "hundred." There would therefore be chiefs of individual villages who would be answerable to the leader in charge of the hundred, who would provide about one hundred soldiers for the keeping of law and order. In times of crisis, or when the tribes were planning to attack, it seems likely that the Germanic hundred would be capable of putting between five thousand and six thousand soldiers into battle. Their chief, with his advisers, would be responsible for leading them on the battlefield.

Doctrine, Strategy, and Tactics

For many of the early German tribes, the primary tactic was to use shock troops—mainly cavalry, but also fast runners on foot—to attack a particular point in the opponents' front line. This would, if successful, lead to the formation of a wedge that would split the forces of the opponents—usually the Romans—and cause panic. The Goths and the Huns later developed this tactic further with cavalry attacks, feigned retreats, and the like. The German leaders had to develop their battle plans carefully beforehand, as their armies were not as well disciplined as those of the Romans and could easily be outmaneuvered by clever Roman commanders. This meant that the charging of the troops at the start of a battle had to be sufficiently fierce to push the battle in their favor quickly. In longer battles, when the sides were evenly balanced, the victories would tend to go to the Romans—which explains why most of the Germanic tribes chose either to attack when they had a vast numerical advantage or to ambush their opponents.

In those instances when large Germanic or other tribal armies fought the Romans, the tribes drew up careful plans, usually with the aim of enticing the Romans further into their territory and setting up an ambush. The destruction of three Roman legions at the Battle of the Teutoburg Forest in 9 C.E. is the most famous example of the success of such tactics. Even when extensive planning had taken place, however, speed was a crucial element for the Germanic tribes in battle.

Thus the most important part of the strategy of the Germanic tribes remained the soldiers who would form a wedge into the opponents' battle lines. The Romans labeled these the *cunei*, following from the Latin term *cuneus*, which, it is believed, came from the term *caput porcunum* (head of a hog). The term stems from the tribes' use of a standard in the shape of the head of a hog or boar that would he held aloft to indicate the direction of any attack. Imbued with some religious significance, this would serve as a battle standard, the capture of which was similar to the capture of Roman standards.

Ancient Sources

The ancient sources of information on the Germanic tribes—the Goths, Visigoths, Vandals, Lombards, and Huns—are invariably Roman accounts. These vary tremendously in their coverage and analysis. The earliest significant account is *Comentarii de bello Gallico* (52-51 B.C.E.; *The Gallic Wars*, in his *Commentaries*, 1609), Julius Caesar's work on the Gallic Wars, in which the great Roman general relates how he succeeded in capturing Gaul. Caesar achieved his success after he managed to win over some Germans to his side with money and other in-

ducements. He is complimentary about the fighting strengths of the Germans, as he not only fought against them but also fought on the same side as them.

De origine et situ Germanorum, also known as *Germania* (c. 98; *The Description of Germanie*, 1598), by the Roman historian Tacitus, also details the Germanic tribes, discussing their traits and their everyday lives. All the information from Tacitus is secondhand, however, as the author himself never went to Germany, and recent historians have cast doubt on some of his ideas about links between tribes. It has been supposed that Tacitus drew information from Pliny the Elder's *Bella germaniae* (c. 47 C.E.), as well as from other published accounts and tales told by soldiers and merchants.

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Justin Corfield

THE ANCIENT WORLD

EASTERN, CENTRAL, AND SOUTHERN ASIA

China
Ancient
Dates: c. 1523 B.C.E.-588 C.E.

Military Achievement

Chinese tradition holds that throughout most of its history, China has relegated warfare and military matters to a secondary role within society. From the earliest dynastic records onward, the Chinese have deliberately differentiated *wen* (cultural or civil) and *wu* (martial) matters. The perfectly ordered society is one in which literate culture triumphs over mere force, and military matters are disdained. Civilized Chinese need not use brute force to maintain internal peace or repulse external aggression. Instead, cultural superiority and demonstrated moral virtue suffice in the pursuit of peace.

Despite these ideals, China's early history revolved around conquest and the centralization of the state. Every major dynasty was founded through warfare, and once unified, China guarded its frontiers with military force and sought to expand its territory at the expense of southern and western neighbors. Inevitably, each dynasty in turn fell as a result of warfare.

The Shang (Chang) are the first historically identifiable ancestors of the Chinese. Chengtang (Ch'eng T'ang) is credited with founding the dynasty, following his decisive victory over Emperor Jie (Chieh) of the Xia (Hsia) Dynasty in 1523 B.C.E. at the Battle of Ming Jiao (Ming Chiao). In a recurring pattern of Chinese historiography, the victorious commander's success is attributed to his moral superiority and his opponent's wretchedness.

Accordingly, the Shang fell as a result of Emperor Zhou Xin's (Chou Hsin) overall bad character and practice of mutilating pregnant women and murdering innocents with abandon. King Wu (the Martial King) led the Zhou into a decisive battle at Muye (Mu-yeh) in 1027 B.C.E. According to the *Shiji* (*Shih Chi*) annals, the Zhou were vastly outnumbered, confronting a Shang army of 700,000 with a lilliputian force of 300 chariots, 3,000 Tiger Guards, and 45,000 foot soldiers. Despite the Shang's overwhelming numbers, the Zhou routed them in a matter of hours. Following an initial charge of one hundred infantry, the chariots were deployed to the astonishment of the Shang troops, who reportedly had never encountered such a mass attack. After their king fled, the Shang forces "inverted their weapons" and gave up the fight. After the death of King Wu, his brother, the duke of Zhou, acted as regent for his young nephew. During his regency, the Zhou domain expanded eastward and purportedly brought fifty states under Zhou control.

The Zhou policy of decentralized rule in its peripheral territories eventually led to its decline in 722 B.C.E., when an alliance of disgruntled vassals and a nomadic tribe killed the Zhou king. Despite moving the capital farther east to avoid further incursions, the Zhou never fully recovered, inaugurating nearly five hundred years of unremitting violence and warfare.

The remaining half of the Zhou dynastic age is subdivided into two sections: the Chunqiu (Ch'un Ch'iu) or Spring and Autumn period (c. 770-476 B.C.E.) and the Warring States period (c. 475-221 B.C.E.). This was an age characterized by the growth of powerful independent states, shifting alliances, and open warfare. Beside a dozen major states, innumerable smaller states existed, some no more than a town surrounded by a thick earthen wall and a few square miles of marginal territory. As Zhou power declined, the major states asserted increasing independence, until, by the Warring States period, their rulers had assumed the title of king. New technologies, including the long sword, crossbow, and iron

implements, allowed the larger states to conquer and control surrounding territories.

Around 307 B.C.E. King Wu Ling of Zhao (Chao) took a cue from the nomadic tribes to the north and introduced the deployment of cavalry. Faster and far more mobile than the war chariot, cavalry revolutionized Warring States conflicts and prompted a change in Chinese uniforms: In place of their traditional long robes, Chinese soldiers now adopted the short tunics and trousers of their northern neighbors. Infantry also took on greater importance, as wars spread into the mountainous terrain and marshy valleys of the Chang (Yangtze) region.

Final unification occurred in 221 B.C.E. when the Qin (Ch'in) systematically defeated its rivals and imposed centralized control over the region. The Qin victory has been traced to two important factors: the strict and ruthless policies of Legalism, which brought Qin subjects under the iron hand of the state, and a highly efficient military structure in which cavalry, iron weapons, and massed infantry overwhelmed their opponents. Following unification, the Qin ordered the confiscation of their opponents' weapons, which were subsequently melted down and molded into twelve statues at the new capital. Old states were abolished, the country was divided into thirty-six commanderies headed by a civil governor and military commander, and prominent families moved to the capital. Once in power, the First Emperor Qin Shihuangdiiqin Shihuangdi (Ch'in Shih huang-ti; 259-210 B.C.E.) secured his northern borders and took control of the southern coast near Guangzhou (Canton).

Upon Shihuangdi's death in 210 B.C.E., the Qin Dynasty immediately fell into chaos, and by 206 B.C.E., the Han Dynasty had been established. Despite constant invasions from the north by the nomadic Xiongnu (Hsiung-nu), the Han managed to retain control of the country, and under the leadership of Wu Di (Wu Tii, 156-87 B.C.E.), the Martial Emperor, greatly expanded their territorial holdings. Between 136 and 56 B.C.E., twenty-five major expeditions were sent, fourteen to the northwest and west, three to the northeast, and eight to the south. In one case, a force of more than 300,000 launched an attack on the Xiongnu (133 B.C.E.). To safeguard his conquests, Wu Di established garrisons along the military routes and sent more than 2,000,000 Chinese to the northwest as colonists. One legendary encounter is reported to have occurred in 42 B.C.E. While on an expedition in the northern district of Sogdiana, a Chinese force purportedly engaged a group of Xiongnu accompanied by Roman legionaries. The Chinese victory is attributed to the use of the crossbow, the arrows of which apparently easily penetrated Roman armor and shields.

By 190 C.E., the Han had begun its decline, and in 194 General Cao Cao (Ts'ao Ts'ao; 155-220 C.E.) had

TURNING POINTS

1600-1066 B.C.E.	The Shang Dynasty rules in China.
1200 B.C.E.	The chariot is introduced to China from the northwest and is later adapted for use in siege warfare.
1066-256 B.C.E.	The Zhou (Chou) Dynasty rules in China.
5th cent. B.C.E.	The crossbow is developed in China, providing more power, speed, and accuracy than the composite bow.
307 B.C.E.	King Wu Ling of Zhao, inspired by steppe nomad tribes to the north, introduces the use of cavalry in China.
221-206 B.C.E.	The Qin (Ch'in) Dynasty rules in China.
206 B.C.E.-220 C.E.	The Han Dynasty rules in China.
220-280	The Wei, Shu, and Wu Dynasties rule in China during Three Kingdoms period.
265-316	Western Jin (Chin) Dynasty rules.
4th cent.	The use of stirrups is introduced in China, allowing cavalry armor to become heavier and more formidable.
317-420	The Eastern Jin Dynasty rules.
386-588	The Southern and Northern Dynasties rule concurrently in China.

emerged victorious in the ensuing civil war. Upon his death, however, the southern states refused to recognize the central authority of the upstart Cao Cao family, and the Han Empire was quickly divided into three major regions, inaugurating yet another 400-year period of almost-constant warfare.

Following the breakup of the Han, three kingdoms emerged. The Wei (220-265) dominated the north and moved into Korea, Shu-Han (221-263) in the southwest subdued several indigenous tribes, and the southern Wu (222-280) expanded as far as Vietnam. In 265, following the conquest of the Shu-Han and the Wu, a Wei general announced the creation of a new dynasty, the Jin (Chin), which would survive until 420. Southern China would then experience a succession of four southern dynasties, lasting into the sixth century. Meanwhile, a series of northern tribes ruled Northern China until 386, when the northern Wei successfully defeated the last kingdom and secured rule until 533.

Weapons, Uniforms, and Armor

Weaponry evolved considerably over the period from 1500 B.C.E. to 500 C.E. During the Shang Dynasty, metallurgy had advanced to the point that nobility was primarily armed with bronze weapons, whereas commoners fought with arms made of wood, stone, or animal bones. Among the common weapons found in grave sites are bronze-tipped spears, probably the earliest known weapons in Chinese history; daggers; the composite reflexive bow and arrow, with the bow both longer and more powerful than its Western counterpart; and the *ge*- (*ko*-) halberd, a battle-ax with a curved bronze blade horizontally mounted atop a long wooden shaft approximately 43 inches long. Used primarily to hook and then slash one's opponent, late variations added a spear to the tip, a hooked blade behind the first, and another to the butt.

The war chariot also played a central role in early Chinese warfare. First introduced to China from the northwest in 1200 B.C.E., the chariot evolved from a symbol of royal power and prestige to a vehicle adapted to the exigencies of siege warfare during the Warring States period. Typically, a chariot team consisted of three men: the driver in the center, a warrior armed with a *ge*-halberd on the right, and an archer to the left. Each would be accompanied by a platoon of foot soldiers armed with spears. Whereas Shang chariots were used primarily as elevated, mobile command posts for royalty, their Zhou counterparts were employed extensively in battle. States were judged by the number of chariots they could field, and battle records routinely reported the numbers captured. The *Zuo Zhuan* (*Tso chuan*, c. 475-221 B.C.E.; *Tso chuan*, 1872) attributes 4,900 chariots to the large Jin state, whereas the much smaller Zhu (Chu) boasted 600 chariots.

As the Warring States period progressed, the chariot was adapted to the emergence of armored infantry and new siege warfare tactics. To ward off infantry, knife blades were added to wheel hubs. Furthermore, whereas previous armies had routinely avoided fortified cities rather than expending manpower on their capture, the newly significant role of cities as economic and political centers now warranted aggressive assaults. Accordingly, chariots were outfitted with large shields, towers, battering rams, movable ladders, and multiarrow crossbows. In defense, towns employed a bewildering array of iron and wooden caltrops, collapsible fences, sharp iron stakes, "mined" moats, and a variety of long axes, halberds, firelances, and hammers. Vessels containing water, iron, sand, and human excrement were also available to hurl upon the heads of besiegers.

Swords do not appear until the middle of the Chunqiu, or Spring and Autumn, period, when they were probably adopted from steppe nomads. The earliest were fashioned from bronze, with iron swords becoming widespread during the Qin Dynasty. Although long, double-edged swords are mentioned as early as the seventh century B.C.E., most would appear to have been relatively short and used principally for thrusting rather than slashing. By the Warring States period, they had become standardized as the *jien* (*chien*), a double-edged sword with a blade measuring approximately 2 feet, eventually reaching a length of 3 feet during the Han Dynasty.

Clearly the most important innovation in early Chinese warfare was the crossbow. Developed in China sometime in the fifth century B.C.E., the new

weapon was more powerful and far more accurate than the composite bow. The standard crossbow consisted of a wooden stock, a bow of laminated bamboo, and an intricately designed bronze trigger mechanism. The mortised stock supported the bow and included both a channel for the arrow and a pistol grip. Trigger mechanisms were complicated devices containing three moving pieces on two shafts that could hold a very heavy-tension load while firing easily and delivering a bolt with greater impact than that of a high-velocity rifle. By removing two pins, the mechanism could be dismantled in case of capture, and the Chinese would guard the secret of its construction well into the Han Dynasty. The earliest bows could be hand-cocked, whereas the later, more powerful versions required either leg strength or a rope tied to the waist. By the time of the Qin Dynasty, crossbows had evolved into repeating models, those which could fire two bolts simultaneously, and larger, winch-powered versions mounted on carts and chariots.

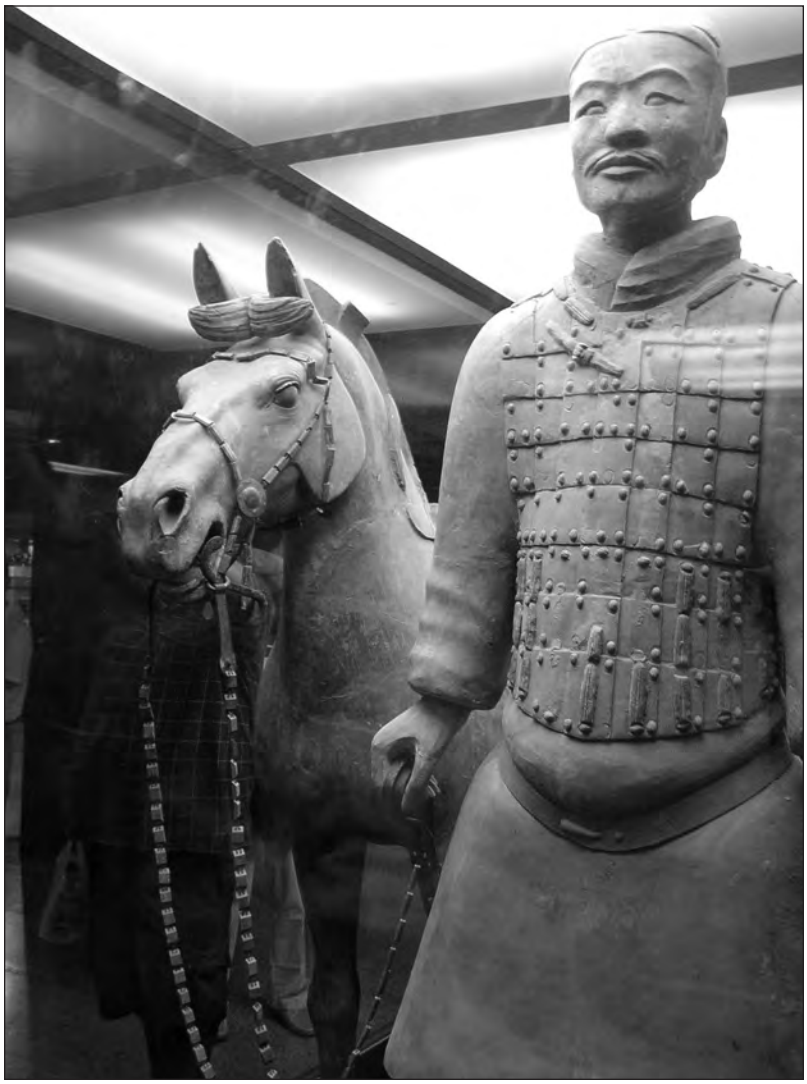
The first Chinese armor appeared during the Shang Dynasty as simple, lacquered leather breastplates secured with leather thongs. Leather continued to be used as late as the sixth century C.E. By contrast, the first helmets were bronze and highly decorated. The construction of Zhou armor became more detailed, with body armor composed of small rectangu-

Robin Chen

Much that has been learned about Qin armor of the third century B.C.E. is known from the life-size terra-cotta figures unearthed near the first emperor's tomb.

lar pieces strung into rows and fastened with leather thongs, a process known as lamellar construction. Individual pieces and the rows themselves were then lacquered and colored.

A great deal about Qin armor is known from the life-size terra-cotta figures unearthed near the first emperor's tomb. Several styles of armor are noted, including short mail jackets of lamellar construction designed to cover the entire upper body; lamellar chest protectors; lamellar armor for charioteers, which includes both neck guards and armor extending to the wrists with plates to protect the hands; and that of the cavalry, shorter than the others and missing shoulder guards. Under the armor, each warrior wears a long-sleeved robe reaching to the knees, along with a heavy cloth bundle at the neck. Short trousers are also discernible.



Robin Chen

Close-up of a Qin soldier and horse from the terra-cotta excavations.

Not until the time of the Han Dynasty was iron used for certain types of armor. Most armor consisted of plates arranged in the lamellar construction, designed to protect the neck, front, back, and thighs. One such suit contained 500 plates and weighed nearly 22 pounds. By the late Han Dynasty, authors begin referring to brilliant dark armor, which may suggest a suit made of decarburized steel, although none have been recovered as yet.

Infantry typically appeared without armor and were generally equipped with little more than a shield and helmet. Most infantrymen wore a simple tunic, trousers, and leather shin guards. Helmets varied from the simple head-covering tied under the chin to heavier versions with straight earflaps. Iron helmets began to appear during the Warring States period but did not become prevalent until the Han Dynasty. Cavalry were furnished with a helmet, a mail jacket with a high collar and flared bottom, and a chaplike protector for the front of the leg.

Horse armor, or barding, appears in some of the earliest histories, but no evidence exists for its use until the end of the Han Dynasty. By that time, the cavalry had become an integral part of warfare, and as the cavalryman's armor improved, measures were also taken to ensure the safety of the horse. Early barding was of a single piece, protecting the top and underside of the horse's neck down to the chest, with some also covering the underside of the belly. As it

evolved, barding became five separate pieces: head mask, neck guard, chest and shoulder guards, side armor, and rump armor. Lamellar construction was again used, with materials varying based on period and geographic region. After stirrups were introduced in the fourth century, the armor for cavalrymen and horses became heavier and more formidable.

Shields varied according to usage, with those carried by charioteers slightly longer than the *ge*-halberd, and those for the infantrymen somewhat shorter. Built on wooden frames, shields were made of either leather or lacquered cloth stretched across the front. Occasionally the leather was fortified by bronze and in some cases painted with patterns and designs. Iron shields appeared alongside iron weapons and the crossbow, although in relatively small quantities until the Qin and Han Dynasties.

MILITARY ORGANIZATION

Shang Dynasty military organization is open to a great deal of speculation. Given the paucity of reliable literary sources, scholars are dependent on archaeological evidence and speculation concerning the actual role of chariots in early warfare. It is clear that Shang social structure centered on clan units designated as *zu* (*tsu*). Most scholars believe that the zu represent military units assigned to protect the walled towns in which they resided. The zu chief functioned as the local military leader; the same arrangement applied to the royal capital, with the king acting as military leader for the kingdom. Each zu may have numbered one hundred members of the nobility, all under the command of the chief or king. A standing army consisting of selected zu members maintained order during peacetime, and all members were subject to mobilization when necessary. In such cases, ten zu were combined to form an army of 10,000. Oracle records suggest that infantry and archers alike were organized into companies of one hundred warriors. Three such companies constituted a regiment, deployed as left, middle, and right companies.

Under the Zhou Dynasty, the chariot emerged as the most important factor in organizing the military. Later tradition holds that each three-man chariot team was accompanied by a platoon of twenty-five infantry, arranged into five squads. Five companies of four chariots were further organized into brigades, then into platoons of 25, divisions of 2,500, and armies of 12,500. Command originated with the emperor, who often led many campaigns himself. A variety of commanders served under him; unfortunately, little is known concerning their functions. Included are such ministers as the Director of Horses, the Runner of Horses, the Commandant, and the Commander. None, however, appear to have been entrusted with full command over imperial forces.

Apart from local variations, this organizational structure held throughout the Spring and Autumn and Warring States periods. However, whereas warfare in the former was conducted by the nobility following strict codes of honor and chivalrous behavior, the latter was marked by increasing violence and retributive combat. As war intensified, the need for manpower increased dramatically, with forced conscription becoming the norm. Although only a single male from each family was required to serve during the Spring and Autumn period, every male became subject to military levy during the Warring States period.

Qin armies were filled through the conscription of peasants into local militia units available for immediate call-ups. Every male between the ages of seventeen and sixty served as either a warrior or a laborer. The Han modified this policy, filling its ranks with conscripts, volunteers, and convicts. Every male between the ages of twenty-three and fifty-six was required to serve two years, one in training, the other in active service at a garrison. Following their stint, soldiers joined the local militia until age fifty-six.

Both the Qin and Han used increasingly sophisticated armies combining infantry, chariots, crossbowmen, and cavalry. The first Qin emperor implemented the use of mounted crossbowmen and their coordination with the composite bow. These combined armies allowed the Chinese to deploy small independent units, as well as traditionally organized larger armies, in the field.

Although the nobility continued to fill the highest command positions, junior officers began to emerge from the general rank and file, being chosen on the basis of ability. Advancement was based on merit,

with an elaborate system of differentiated pay relative to one's seniority and rank. Officers were assigned as a particular need arose. Titles and roles related specifically to the campaign, with several generals assigned to each to avoid possible coups.

The Han military was organized into three principal units: a standing garrison at the capital, a task force on the march, and a permanent frontier defense. Once mobilized in an emergency, the military was organized into divisions led by the generals, regiments led by colonels, companies led by captains, and platoons led by commanders. Although local variations would appear in the chaos that followed upon the collapse of the Han, this basic organizational structure as established by the Qin and Han continued to prevail.

The size of Chinese armies has been notoriously difficult to calculate, particularly for the earliest Shang and Western Zhou periods. As noted above, the war between the Zhou and Shang was said to have been fought by a Shang army of 700,000 and a Zhou force of 300 chariots, 3,000 Tiger Guards, and 45,000 foot soldiers. By the Spring and Autumn period, when warfare had become highly ritualized and was dominated by aristocratic charioteers, field armies typically numbered in the thousands but would appear to have rarely exceeded 10,000. As the scale of war increased in the Warring States period, the size of armies grew dramatically. In order to lay siege to fortified cities and to conduct wars that often took years to complete, hundreds of thousands of men were required. According to one contemporary account, the typical army consisted of "one thousand chariots, ten thousands of cavalry, and several hundred thousand armored warriors." The smallest of the warring states fielded armies of more than 300,000; the largest, such as Qin, commanded more than 1,000,000. Likewise, Han expeditions numbering from 50,000 to 300,000 were routinely sent out to quell rebellions and punish nomadic invaders.

Doctrine, Strategy, and Tactics

Throughout the Shang and early Zhou periods, warfare was violent and fought in the Homeric style. Chariots served as transport or observational platforms, and warriors fought with spears, axes, and composite bows. If the military classic the *Taigong* (*T'ai Kung*, c. third century B.C.E.; *Tai Kung's Six Secret Teachings*, 1993) is to be trusted in its account of the Zhou triumph over the Shang, total warfare was to be fought by utilizing every conceivable method and resource necessary to achieve victory. The state's resources and all customary means of production

North Wind Picture Archives via AP Images

A Chinese Tiger Guard with weapons.

China During the Warring States and Han Dynasty, 475 B.C.E.-221 C.E.

were to be employed in the campaign's execution. Strategically, the capable general would analyze the entire situation before engaging the enemy, gauging such factors as terrain, methods of attack and counterattack, escape routes, and techniques for psychological warfare. The *Taigong* advocates employing subterfuge and deception as the most effective means of securing victory. Among other tactics, the successful campaign would utilize feints, false attacks, and limited encounters to confuse and disorient the enemy before the main attack. In prosecuting the war, the best strategies would promote confusion within the enemy's ranks through aggression, misinformation, and speed. The humane treatment of prisoners would encourage others to surrender.

A new era of warfare began in the Spring and Autumn period. This was the great age of chivalry, in which honor and virtue dictated both strategy and the conduct of warfare. Fighting was ideally a game played between members of the nobility, mounted in chariots and accompanied by platoons of foot soldiers. During the heyday of chariot warfare, gentlemen studied the arts of charioteering, archery, and virtuous conduct. Actual combat followed an excessively strict code of conduct calling for bravery, valor, and honor. War was to be pursued with moderation and respect for the opponent. For instance, the duke of Song (Sung) waited for his enemy to cross a river and arrange his battle forces before launching his attack. Following his humiliating defeat, the duke justified his action by referring to the sage, who "does not crush the feeble nor order the attack until his enemy has formed his ranks." In another instance, "Yen Hsi shot a man in the eyebrow and retired, saying 'I have no valor. I was aiming at his eye.'"

Such sentiments were forgotten during the Warring States period. However, even as the violence escalated, strategists continued to advocate deception and speed as the primary means of securing victory. Siege warfare introduced new strategies and tactics, as massive armies sought to wrest control of fortified cities from their occupants, who in turn deployed new technologies designed to repulse the aggressors. In this regard, the Mohists became the undisputed masters of defensive warfare in ancient China.

Bingfa (c. 510 B.C.E.; *The Art of War*, 1910), by Sunzi (Sun Tzu; fl. c. 500 B.C.E.), is certainly the most famous text from this period. A general in the service of Wu, Sunzi had the primary objective of obtaining victory without combat. He argued that a more comprehensive victory could be forged by using diplomatic means, breaking up alliances, and thwarting the enemy's own strategy. In general, one should gain victory at the least cost possible, for both oneself and the enemy. "Thus attaining one hundred victories in one hundred battles is not the height of excellence. Subjugating the enemy's army without fighting is the true height of excellence." Failing that, he emphasized the manipulation of the enemy through the use of terrain, psychology, and the employment of both unorthodox and orthodox methods. Sunzi believed that "warfare is the way [*dao*/*tao*] of deception," advancing where least expected and attacking where the enemy is least prepared. Although he advocated unorthodox methods such as flanking movements and circular thrusts, Sunzi also insisted that orthodox measures could be effective, if they were employed in an unorthodox manner.

While specific tactics and strategies evolved and adapted to new technologies and the changing face of war, the fundamental principles espoused by Sunzi and other classical theoreticians continued to hold sway. From the Warring States period to the chaos following the fall of the Han, Chinese warfare emphasized the doctrine of maneuverability. Beginning with the fundamental organization of armies into flexible, self-reliant units of five, military maneuvers sought to exploit enemy weaknesses through speed, deception, and misdirection. Every strategist sought to manipulate the enemy into disadvantageous positions by using surprise, by exploiting climatic and topographical factors, and by psychologically and physically destabilizing the enemy to gain temporary, context-specific advantages.

Thus, even as the Han adapted the cavalry, they devised new strategies to defeat it. In 99 B.C.E., Li Ling defeated a cavalry of 30,000 using only 5,000 infantrymen. Behind a line of infantry armed with shields and pikes, Li Ling positioned archers with powerful multiple-firing crossbows. The nomadic horsemen continually charged unsuccessfully. Zhuge

Liang (Chu-ko Liang, 181-234), who served as adviser to the founder of the Shu-Han Dynasty (221-263), was a brilliant mathematician, mechanical engineer, and military strategist who both used and wrote a commentary on Sunzi's *The Art of War*. Said to have never fallen in battle, Zhuge became one of China's most celebrated heroes, was named a Confucian saint in 1724, and was immortalized in Luo Guanzhong's (Lo Kuan-chung; c. 1320-c. 1380) fourteenth century historical novel *San kuo chi yen-i* (*Romance of the Three Kingdoms*, 1925). Subsequent generations of tacticians continued to revere and employ the stratagems formulated by Sunzi and his contemporaries.

ANCIENT SOURCES

The most important primary sources fall into two basic categories. The first are the numerous histories compiled throughout this period. These include the *Shujing* (*Shu ching*), or *Book of History* (1918), which purports to cover the years 2357-627 B.C.E.; the *Chunqiu* (*Ch'un ch'iu*), translated as *Ch'un ts'ew* in 1872 and also known as the *Spring and Autumn Annals*, chronicling the period from 722 to 481 B.C.E.; the *Zuo Zhuan* (*Tso chuan*), or *Tradition of Zuo*, a commentary that carries Zhou history down to 468 B.C.E.; and the first official Chinese history, the *Shiji* (*Shih-chi*, 104 B.C.E.; *Records of the Grand Historian of China*, 1961), compiled by Sima Qian (Ssu-ma Ch'ien, c. 145-90 B.C.E.).

The second principal resource consists of several military texts brought together during the Song (Sung) Dynasty (960-1126 C.E.) and placed in a collection known as the Seven Military Classics. Each provides varying degrees of detail concerning the art of warfare, military strategy, and organization, along with references to the types of weapons used. As traditionally arranged, the Seven Military Classics consist of Sunzi's *Bingfa*, the *Wuzi* (*Wu-tzu*, c. 400 B.C.E.; *Wu-tzu*, 1993), *Sima Fa* (*Ssu-ma Fa*, c. fourth century B.C.E.; *The Methods of the Ssu-ma*, 1993), *Lei Weigong Wen Dui* (*Lei Wei-kung Wen Tui*, c. 600 C.E.; *Questions and Replies Between T'ang T'ai-tsung and Li Wei-kung*, 1993), the *Wei Liaozi* (*Wei Liao Tzu*, c. fourth century B.C.E.; *Wei Liao-tzu*, 1993), the *Huang Shigong San Lüe* (*Huang Shi-kung San Lüeh*, c. first century C.E.; *Three Strategies of Huang Shih-kung*, 1993), and the *Taigong*.

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Jeffrey Dippmann

Nomadic Warriors of the Steppe

Dates: To c. 500 C.E.

Military Achievement

The most significant of the steppe warrior societies included the Scythian, Xiongnu (Hsiung-nu), Yuezhi (Yüeh-chih), Śaka, Sarmatian, Avar, Hun, and White Hun. Some, such as the Yuezhi, were Indo-European peoples, and others, such as the Huns, were Turko-Mongolian peoples. Population growth was marked by competition for pasture lands in the north and by irrigation networks to the south. Nomadic societies looked to towns for trade but at other times were tempted to raid their accumulated produce and crafts. Until the emergence of cannons and muskets, the settled communities were easy prey for the mounted nomad warriors.

Scyths spread their nomadic influences across the Eurasian continent from Mongolia in the east to the Russian grasslands in the west. Believed to be Iranians from Turkistan who had refused to succumb to the settled existence of the Persian state to the south, some of the Scyths moved into the plains north of the Black Sea, displacing the Cimmerians in the Russian steppes after 750 B.C.E. From that base they attacked the fleeing Cimmerians, who penetrated the Assyrian lands to the south. Under a leader named Madyas, the Scyths subjugated the Medes about 628 B.C.E. Although the Medes rebelled and turned the Scyths northward, the Scyths were the first of the mounted nomad warriors to threaten the classical cultures south of the Black Sea. With iron implements forged by craftsmen from the Urals, the Scyths created the first recognized northern Eurasian empire, with territory extending from the Danube to Mongolia. Although divisions within their ranks were common, their federations remained threats to all the nearby communities for centuries. Although the Scyths who remained in Turkestan when the others moved across the Volga were called Śakas by the Persians, they were of the same Iranian nomad stock.

Steppe nomads were not always on the offensive. In the sixth century B.C.E. Cyrus the Great (c. 601 to 590-c. 530 B.C.E.) of Persia invaded Scythian Parthia, in the area of present southern Turkmenistan, before leading an army through the deserts of Gedrosia, in present Baluchistan, to defeat the Amyrgian Śakas of the mountains. Later his armies overran the Uzbek steppes between the Amu Dar'ya and the Syr Dar'ya Rivers. Along the latter Cyrus constructed a town named Cyropolis, later known as Khudzhand and Leninabad. To protect his territories he constructed seven forts to guard against the aggressive Śakas. In September, 529 B.C.E., the Massagetae Scyths defeated Cyrus even though other Scythian mercenaries had been recruited against these Śaka tribes east of Khiva. In 512 B.C.E. Darius the Great (550-486 B.C.E.) attacked and defeated the Tigrakhanda Śakas, also called the "Pointed Hat Śakas," of the Aral Sea region, capturing their chieftain. Other Śakas to the north and east were out of the range of Darius's conquests. Hence, Darius established twenty satrapys, or provinces, in his lands, including Bactria, Śaka, and Khorezm-Sogdia.

Farther west, Scythian ruler Ateas (died 339 B.C.E.) led his forces to challenge the Macedonian forces of Philip II (382-336 B.C.E.) in 340 B.C.E. but was killed the following year in battle against the Macedonians, after which the Scythians were absorbed by the Sarmatians, another Iranian nomad people of the Russian steppes. By 350 B.C.E. the Sarmatians were already governing the Pontic steppes, where they founded Kamenskoye, present Dniprodzerzhyns'k. Like the Scyths, these mounted nomads wore coats of mail and depended more on the lance than on the bow. By the late third century the Sarmatians had forced the Scyths south toward the Crimea and occupied the Russian steppes west of the Volga.

The Scyths of Central Asia, however, continued to menace the wealthy oases and towns to the south.

Macedonian leader Alexander the Great (356-323 B.C.E.), after conquering Persia, had failed to extend his rule over the nomads of that region. On the south bank of the Jaxartes River he founded a frontier outpost, Alexandria Eschate, but in 329 B.C.E. rebellious Śakas in Sogdiana threatened his new frontier town. Alexander then launched a campaign of terror enabling him to regain command of most of Sogdiana, including Maracanda, present Samarqand. The Scyths in Parthia seceded from Alexander's successors in the third century B.C.E., and during the Seleucid civil wars nomad strength was revived. More Scythian nomads from the northern steppes invaded Parthia to aid the local nomads led by Arsaces (fl. third century B.C.E.), who established an independent state with Nisa as its capital.

Farther east, a Turko-Mongolian people had begun attacking the Chinese empire as early as the ninth century B.C.E. Like the Scyths, these were nomadic, mounted warriors whose aggressiveness later caused the Chinese to construct the Great Wall. They were probably the ancestors of the Xiongnu, the earliest of the famous Huns. At any rate the Chinese were to adopt a more mobile style of warfare better suited to defense against these mounted neighbors. Only by the second half of the third century B.C.E. did these Xiongnu unite under a leader called the Shanyu (Shan-yü). Under Shanyu Duman (Shan-yü Tuman, died c. 210 B.C.E.), they moved into western Gansu (Kansu). Duman's son and successor, Mao Dun (Mao-tun), fought several wars with the Chinese and then turned westward in 177 B.C.E. to complete the conquest of western Gansu from the Yuezhi, driving the remnants into the Gobi Desert. However, the Xiongnu had been compelled to sign a treaty with China's Han rulers in 198 B.C.E., the beginning of Chinese ascendancy over the nomads. Han emperor Wu Di (Wu Ti, 156-87 B.C.E.) attacked the Xiongnu of the Ordos west of China and ended the payment of tribute to the horde in 133 B.C.E. Within twelve years China overcame the Xiongnu in Gansu and initiated Chinese settlements there. Han troops then attacked the Xiongnu in Mongolia. By 48 B.C.E. the Xiongnu presence had disintegrated in Mongolia, and the southern branch recognized Chinese hegemony to inhabit the Ordos region as subjects.

Meanwhile, after 140 B.C.E. Śaka nomads had overwhelmed the Bactrian kingdom of Heliocles I (r. 150-140), bringing an end to the Greco-Bactrian state. They themselves were being pushed south by the Yuezhi. Chinese sources place them in Xingjiang province, present eastern Turkistan, as early as the fifth century B.C.E.. The Yuezhih, also called Tochari, were an Indo-European people dwelling in Gansu (part of Xinjiang), just south of the Gobi Desert, by the early second century B.C.E. In approximately 177 B.C.E. they were driven from that region to the Ili Valley by chief Mao Dun of the Xiongnu and twelve years later were forced south by the Wu Sun (Wu-sun), ancestors of the Sarmatian Alans and vassals of the Xiongnu. Part of the Yuezhi formed a confederacy and moved south to the Tibetan mountains. Most, however, occupied territories between the Amu Dar'ya and Syr Dar'ya Rivers in Sogdia, driving Śaka tribes south into Khorāsān and Bactria. The Yuezhi established their capital at Kienshih, previously known as Maracanda and Samarqand. In 138 B.C.E. the Chinese Han emperor Wu Di dispatched an ambassador to the Fergana Valley to secure the Yuezhi's assistance against the Xiongnu. However, the embassy came to nothing, because the Yuezhi were more interested in the southern lands. Hence the

TURNING POINTS

1000 B.C.E.	Cimmerians first produce bronze battle-axes.
900 B.C.E.	Scyths and succeeding steppe warriors master the use of bows while on horseback.
6th cent. B.C.E.	The lance is first used by the Alans and Sarmatians, and the chariot is first used by various tribes in battle.
4th-3d cent. B.C.E.	The use of protective bone breastplates is regularly adopted.
2d cent. C.E.	The use of armor spreads from the Ukraine to Manchuria.
451	Attila the Hun invades Roman Gaul.

Yuezhi invaded Bactria between 141 and 128 B.C.E., after which the region was renamed Tocharistan. One branch of the Yuezhi, the Kushāns, moved into the Sistan and Kabul river valleys and crossed the Indus River in 50 C.E. to establish the Kushān Dynasty in northwestern India. Nevertheless, a Yuezhi state continued to exist into the next century in Bactria.

In 380 C.E. a chieftain named Toulun led his Mongolian people, called the Juan-juan, westward from China. These warriors defeated the Xiongnu to establish a large steppe empire. About a generation later Toulun adopted the title of "khan" or "khagan." The Juan-juan were eventually overwhelmed, however, by the Toga Turks, who controlled northern China in the fifth century. The remaining Juan-juan migrated to the Yenisei region in Siberia to launch the Avar Empire that spread westward through the steppes. That empire lasted until it was overthrown by the Altai Turks under a leader named Tuman or Duman, who took the title Khan of the Blue (or Celestial) Turks. Meanwhile, the western tribes of the Avars migrated to the Russian-Ukrainian steppes, eventually invading Eastern Europe to threaten the Byzantines for two hundred years.

The Huns emerged in fourth century B.C.E. Mongolia. Although little is known about them for several centuries, they most probably descended from the Turkic Xiongnu. After they had established control of Inner and Outer Mongolia, a rift occurred in their ranks by the year 44 C.E. Some of the Huns formed a new confederation and moved the nation into what is now Kazakhstan. By 48 C.E. the eastern branch further split into northern and southern factions, and the former were conquered by Mongol tribes called the Xianbi (Hsien-pi). Those in the south became confederates of the Chinese emperor and resided south of the Great Wall in Shansi. These southerners, under Liu Cong (Liu Ts'ung, died c. 334), eventually overthrew the Chinese emperors and became rulers of North China by 318. However, by 348 this Hun or Xiongnu Empire in China had collapsed.

The western Huns took their federation farther west, across the Volga, in 374, defeating first the Sarmatian Alans and then the Ostrogoths. All of the Goths were pressured to leave the steppes for Roman East Europe, and the Huns then followed them, terrifying the inhabitants with their mounted archers. The Roman historian Ammianus Marcellinus (c. 330-395 C.E.) described them as "skilled in unimaginable ferocity." In 432 the Romans were compelled to pay tribute to the Huns. When the Romans later balked at further exactions, Attila (c. 406-453), the Hun chieftain, led the Huns farther into the Roman world, as the emperor ceded vast lands to them south of the Danube River. Early in 451 Attila moved his nation into Roman Gaul. After crossing the Rhine, he set Metz ablaze but failed to take the fortified town of Orléans. He was stopped to the west of Troyes by a Frankish-Roman confederacy under Aëtius (died 454) in 451. A year later the Huns ravaged Milan and Pavia in Italy before retiring northward, following the promise of tribute by the bishop of Rome. After the death of Attila in Pannonia in 453, no new leader could manage to hold the nation together. The forced allies revolted and killed Attila's eldest son. Another son, Dengizich (died 469), at first directed the Huns back toward the steppes but then altered course to attack the Eastern Roman Empire. The Huns were defeated, Dengizich was killed, and his head was placed on exhibit in the circus of Constantinople in 468.

In Central Asia another horde, called the Ephthalite or White Huns, moved south from the Altai Mountains to the Aral Sea region of Turkestan in the mid-fifth century. This horde occupied Sogdiana, Transoxiana, and south to Bactria. Later in the fifth century they attacked Khorāsān, killing the Sāsānian king Peroz. Subsequently the White Huns took Merv and Herat, eventually replacing the Yuezhi and Kushāns in Bactria, Kandahar, and Kabul. They were stopped, however, when they attempted to conquer the Punjab. Sources describe these White Huns as barbarians eschewing all the elements of settled civilization. Like their counterparts in the West, they seem to have passed out of history in the same era.

WEAPONS, UNIFORMS, AND ARMOR

Paleolithic grave sites reveal the use of knives and spear points. Those of the Andronovo population of 1750 to 800 B.C.E. show flint arrowheads and bronze weapons. However, such evidence may indicate more

of a hunting than a military culture. The Okunev peoples, who engaged in metalworking in the Altai Mountain region in the era from 1800 to 1500 B.C.E., may have been the first Siberians to develop metallurgy, especially bronze casting, for military enterprises, although armed horsemen arose much later. The Cimmerians had produced bronze battle-axes by 1000 B.C.E. Early in that first millennium sword-length daggers with hollow handles were typically found in grave sites. The first militant horsemen appeared in north Central Asia at about this time.

HUNNIC MIGRATIONS, C. 484

With the rise of organized warfare, the dominant weapon in the steppe was the bow and arrow. The Scyths and their successors in the steppes surpassed all other peoples in their ability to fire with accuracy from both sides (50-60 meters) while galloping on horseback at great speed. After dismounting they could fire also with amazing agility while running at full speed. Their arrows were usually of sharp bone points, shot from composite bows made from different materials, usually with a wooden core backed with sinews and bellied with horn. The length of the bow was 140 to 160 centimeters, and the string was permanently attached to one end. Such bows were found in graves from the fourth century B.C.E. Characteristic of the Scythian bow was its short length and double-curved nature. They were made by professional craftsmen, not by the steppe warriors themselves. Much later the Huns improved the composite bow, which was copied by the Romans.

Among other common steppe weapons was the lance, used since the sixth century B.C.E. The longest one was extended 10 feet and its weight was such that the user held it with two hands while on horseback. First used by the Alans and Sarmatians, it was still employed by the Huns one thousand years later. The lasso, used to entangle an opponent before hand-to-hand combat, was a device employed by the Alans, the Sarmatians, and later the Huns.

As for armor, the steppe warriors for centuries fought without breastplates, until they were first worn by nobles. Gradually, the practice of wearing protective cuirasses made from bone or horn began to be regularly adopted. By the fourth or third centuries B.C.E. bone breastplates were found in use from evidence in burial mounds of the lower Ob River, although bone lamellae from as early as the eighteenth century B.C.E. have been discovered in the Cis-Baikal region. From 100 B.C.E. to 100 C.E. scale armor was introduced by steppe warriors in the Altai region and in Western Siberia.

The Xiongnu wore leather and bone armor and sometimes even bronze. Iron scales were used in Tuva as early as the second century B.C.E. Within a century, chain mail had appeared among the Sarmatians in the Kuban Basin. Use of armor spread from

the Ukraine to Manchuria by the second century C.E. By the early fifth century the nobles among the Huns wore a metal thorax that covered the sides as well as the breast. By this time the same Huns wore helmets that protected even the nose, a device that may have been Sāsānian in origin. In the East, tribes wore such helmets by the beginning of the modern era. To decrease their weight, shields were made of wicker and supported by leather; they were made smaller for use on horseback and larger for use on foot. As for dress, common to the both the Scyths and Huns were wide trousers, gripped tight at the ankles to facilitate horse riding. The sleeves of the loose robes were also wound close to the wrists. Ammianus wrote that the Huns wore "ratskin" and linen tunics until they "rotted away on their bodies."

Library of Congress

Mounted Hunnic warriors on a raid carry a collection of weapons, including spears, swords, maces, and bows and arrows.

MILITARY ORGANIZATION

Steppe warriors were ruled by khagans, or khans, who exercised total authority over their troops. Organization was primitive, but the warriors gave allegiance to the tribal nobles who administered the wishes of the khagan. Military federations were formed, reformed, disintegrated, and overwhelmed. Armies depended upon the charismatic appeal of the leader and, upon his death, civil wars usually erupted among the followers of each son until the strongest was able to meld together a new federation. Grave sites confirm the existence of class among the warriors, and the elites were the first to wear armored protection. Armies also included women warriors, who may have constituted between 15 and 18 percent of the fighting forces. Most steppe warriors of the early centuries had no known military organization, similar to that of the medieval Mongols, yet the Huns were organized into right and left provinces, each of which was under a king who governed his army commanders. They in turn supervised the chiefs of either one thousand, one hundred, or even ten soldiers.

Most, however, were simply organized into hordes, living off the conquered lands by pillaging. As they moved over long distances, their allegiances were fragile, often breaking down over competing grazing rights or plunder.

DOCTRINE, STRATEGY, AND TACTICS

Nomad military success depended upon speed, surprise, and psychology. The rapid advance of the cavalry would be highlighted by volleys of arrows from the horsemen followed by hand-to-hand fighting by scattered bands who appeared to fight in disarray, but whose intent was to destroy any unity among the opposition. Often, when fighting other steppe tribes, the strategy of feigned flight was successfully employed. Sometimes steppe warriors fled quickly when encountering opposition and then suddenly reversed direction to attack again with amazing speed. There was no strategy employed to attack fortified positions, because, in most cases, warriors' accuracy with bows was sufficient to overcome the defenders. In many cases, combat was accompanied by "howling" typical of the Avars, Magyars, Huns, and others. Another psychological weapon was the well-advertised practice of scalping their defeated foes, whose heads were used for drinking vessels during victory feasts. From the Scyths in the West to the Xiongnu in the East, the steppe warriors were known for their swift, unexpected raids for plunder. If pursued, they would lead their opponents into an open field, where they could not be pinned down and where their horses could work to the best advantage. The nomads would employ volleys of arrows to exhaust their foes before engaging them in hand-to-hand combat.

As early as the fourth millennium B.C.E. the skill of horse riding may have existed in the region of modern Kazakhstan. The horse culture became so pervasive among the steppe peoples that the warriors, men and women, spent a great portion of their lives on horseback, eating, fighting, negotiating, and even sleeping. Such traits were common throughout the long history of nomadic peoples, whether Turk, Mongol, or Indo-European. Early steppe horsemen wore neither metal stirrups nor spurs, and they directed their horses with whips. Surely, however, the Avars used the stirrup with great success in their attacks on Eastern Europe. The early warriors used few saddles, though pillow saddles stuffed with deer hair were discovered in graves at Pazyryk. At the same site was evidence of earmarks to discern ownership of horses, and by the second century C.E., the Sarmatians were branding horses. From the era of the Scyths, steppe peoples castrated their male horses to better manage their herds.

Grave sites and burial mounds also reveal the use of chariots for carrying war booty from battle, as well as for fighting. Such practice was true of the Scyths (Śaka), Sarmatians, Xiongnu, Alans, and Huns from the sixth century B.C.E. Two-wheeled chariots drawn by steppe horses provided formidable fighting forces. The custom of burying chariots in the graves of rulers was common in Mesopotamia, the steppe cultures of Eurasia, and China. By 900 B.C.E. steppe warriors had mastered the art of attacking with bows and arrows while on horseback. When on march the warriors consumed fermented horse milk, horse blood, and sometimes a mixture of the two, as well as horse meat and cheese. It is said they even tenderized the meat by pounding it under their saddles.

ANCIENT SOURCES

Ancient sources on the earliest history of steppe warfare depend more on the findings of modern archaeologists than upon the ancient writers. Nevertheless, valuable information still rests upon classic works such as Sunzi's (Sun Tzu) *Bingfa* (c. 510 B.C.E.; *The Art of War*, 1910), which deals in part with the Chinese wars with the Xiongnu nomads. The military exploits of the Scyths, Massagetae, Cimmerians, and even the Amazons are fully described by the Greek historian Herodotus (c. 484-424 B.C.E.), especially in chapter 4 of his *Historiai Herodotou* (c. 424 B.C.E.; *The History*, 1709).

The Roman historian Ammianus Marcellinus (c. 330-395 C.E.), who was born a Greek and later served as an officer in the Eastern Roman armies, wrote a history describing the plight of the Roman Empire in its struggles with the barbarians, including the Huns and Avars. He did not know the Huns directly but relied upon Gothic intermediaries, ending his account in the 390's. The sixth century Gothic historian Jordanes tells much about the Huns from his knowledge of the writings, which survive only in fragments, of the Roman philosopher Helvidius Priscus (died c. 70-79 C.E.).

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John D. Windhausen

India and South Asia

Ancient

Dates: c. 1400 B.C.E.-500 C.E.

Political Considerations

Compared with those of other ancient civilizations, the interstate relations and warfare of India were the weakest aspects of Indian political affairs. Much of the role of fighting was traditionally assigned to the *kṣatriya* warrior caste. This caste, similar in some ways to the knights of medieval Europe, had its own traditions and customs, similar to the European concept of chivalry. The art of fighting was extolled and ancient epics glorified war, with legends such as the *Rāmāyaṇa* seeing men fighting demons. However, India appears to have displayed little skill in military matters. Generally peaceful and docile, the people of ancient India were not able to offer much resistance to hordes of invaders from the north. Even medieval Hindu kingdoms could not create lasting empires, maintain strong alliances, or sustain large military forces. Ancient traditions, cumbersome pedantic theories, and outmoded military techniques hampered the progression of military science. None of these burdened the invaders of India. War was accepted as an essential state activity, and condemnation of it was rarely voiced in Indian literature. The quintessential Jain-Buddhist doctrine of ahīṃsā, or nonviolence, was never interpreted as a condemnation of war until the Mahatma Gandhi (1869-1948) took up the banner in the twentieth century. Even Aśoka the Great (c. 302-c. 232 B.C.E.), the only monarch to repudiate war, as well as most Buddhist kings, accepted the use of warfare as necessary to achieve the cultural unit of Bhāratavarṣa, the ancient name of India—a dream constantly challenged by invaders of Indian soil.

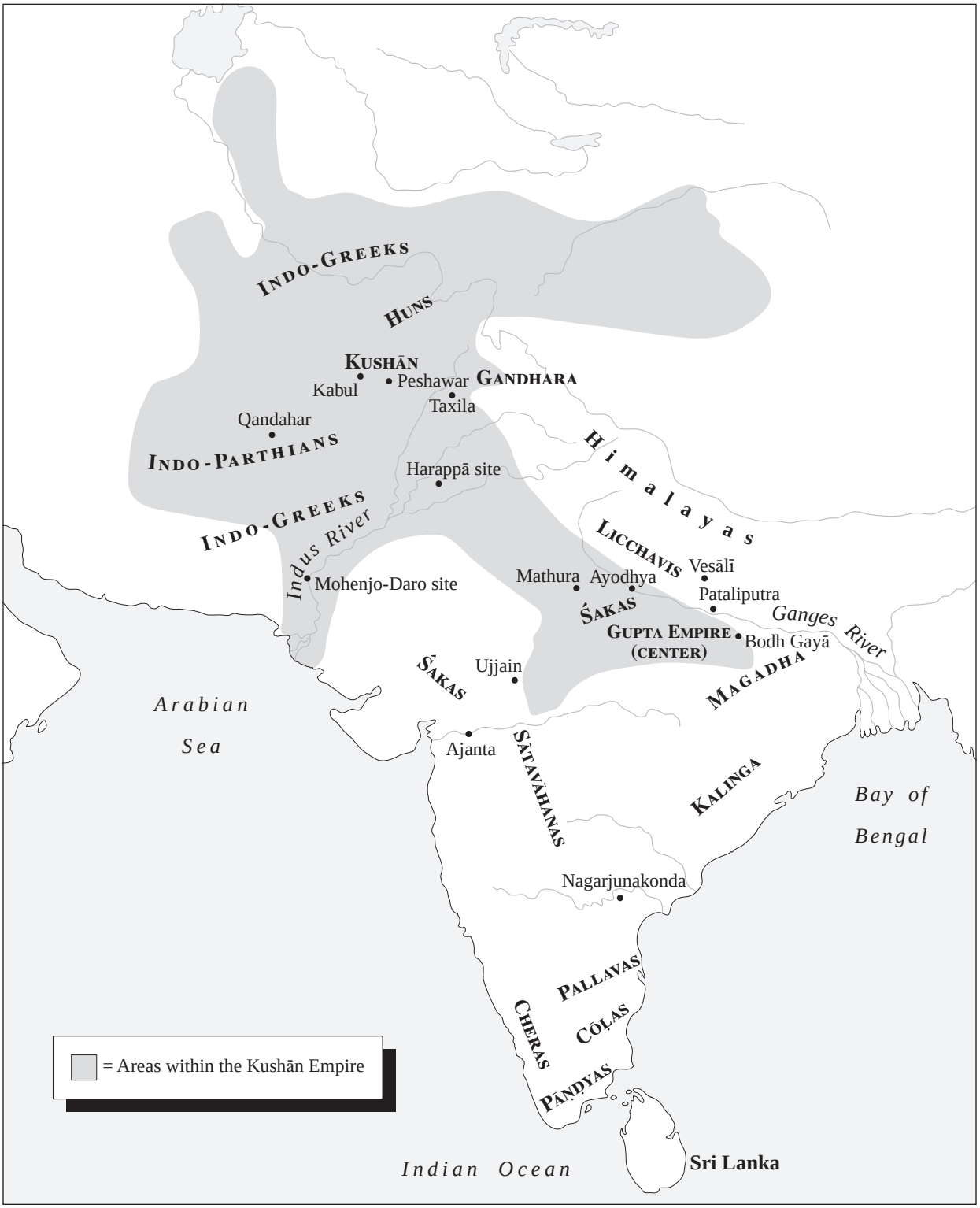
Military Achievement

The military history of South Asia coincides with the influx of Indo-European invaders, who, hardened by migrations from the steppes of Eastern Europe,

Turning Points

c. 1800-1000 B.C.E.	Aryan invaders conquer India, mixing with earlier cultures to produce a new Hindu civilization in the area of the Ganges River Valley.
c. 1000-600 B.C.E.	Aryan Hindu civilization comes to dominate most of northern and central India while smaller states wage war for control in the South.
326 B.C.E.	The Indian king Porus employs war elephants against the forces of Alexander the Great at the Battle of the Hydaspes River, seriously disrupting the Macedonian phalanx.
c. 321 B.C.E.	Chandragupta Maurya expels Alexander's forces from India and establishes the Mauryan Dynasty.
4th cent. B.C.E.	The *Arthaśāstra*, an influential treatise on Indian politics, administration, and military science, is reputedly written by the prime minister Kauṭilya.
c. 274 B.C.E.	Aśoka the Great, grandson of Chandragupta Maurya and a military genius in his own right, solidifies the strength of the Mauryan Empire.
320 C.E.	Chandragupta I establishes the Gupta Dynasty, recalling the glory days of the Mauryan Empire and employing a feudal system of decentralized authority.

Indian Kingdoms and Empires, 400 B.C.E.-500 C.E.



entered the Indus Valley and made contacts with the indigenous, dark-skinned Dravidians. The innate aggressiveness, superior military technology, iron weaponry, and horse-drawn chariots of the steppe nomad warriors successfully overwhelmed the local population. However, little is actually known of the conflicts between the two cultures. Archaeological finds present scant evidence of military conflict. Integration of the Indus Valley seems to have been achieved by means other than military absorption. The synthesis of the two cultures resulted in a Hindu civilization after 1400 B.C.E. in which small states pursued incessant warfare for dominance. Against this background developed the *Vedas*, the most ancient and sacred writings of Hinduism, which give tantalizing clues to military events of the Vedic period.

The post-Vedic era, however, produced reliable histories describing military events and weaponry in South Asia. The format of war that continued well into the modern era had its birth around 400 B.C.E. Between 600 and 400 B.C.E. a patchwork of feudal tribal states consolidated into sixteen republics, *māhajanapadas*, four of which in the eastern Gangetic Valley—Kosala, Kasi, Magadha, and Vrjji—gained ascendancy. Magadha emerged victorious under Chandragupta Maurya (r. c. 321-297 B.C.E.), who founded the Mauryan Empire and expelled the forces of Alexander the Great (356-323 B.C.E.) from India. The Mauryan Empire achieved its grandeur under Chandragupta's son, Bindusāra (r. c. 297-272 B.C.E.), and grandson, Aśoka. Of these, Alexander, Chandragupta, and Aśoka represent the first great military geniuses of Indian history. Although the art of warfare that Chandragupta learned from the Macedonians helped him solidify India under the banner of the Mauryas, dramatic developments in warfare remained static for approximately 2,200 years. Aśoka even renounced war and its effects in favor of Buddhist pacifism, although later Buddhist monarchs such as Harṣa of Kanauj (c. 590-647 C.E.) and Dharmapāla of Bihār and Bengal (r. c. 770-810 C.E.) pursued their political aims as ruthlessly as their Hindu neighbors.

Between 200 and 180 B.C.E. Mauryan power steadily declined, setting the stage for invasions by the Scythians, Parthians, and Yuezhi, with ensuing warfare and chaos. Dynasties rose and fell, with the Scythians, or Śakas, establishing a foothold in North India between 80 and 40 B.C.E. that was held by the efforts of the Andhra king. At the dawn of the Christian era the Andhra Dynasty controlled central India, and the Śakas the Indus Valley. South India, although independent, was engulfed in constant warfare between the Cōla, Pandya, and Chēras kingdoms.

The first two hundred years of the Christian era continued as a period of confusion throughout Hindu India with no significant developments in design or employment of weaponry. Between l and 50 C.E. an offshoot of the Śaka, the Kushān, entered the Punjab and carved out a vast empire under Kaniṣka (fl. c. 78-103) between 78 and 103 C.E. It was a short-lived attempt at empire building. Upon Kaniṣka's death, Śaka authority was usurped by satraps and feudal lords who maintained a state of confusion for ninety-seven years. During this period wars in South India were marked by copious bloodshed, violence, ferocity, and treachery, while in the north warfare was a sport of the monarchs, rarely a struggle for existence. Northern wars usually had limited objectives and were less savage than wars elsewhere in the world.

During the third and fourth centuries, kingdoms continued to rise and fall with no major power appearing on the scene. The Kushān Dynasty lingered into the mid-third century, and the Andhra Dynasty in the south collapsed and was replaced by the Pallava Dynasty of warrior kings, who dreamed of expansion. In 300 C.E. another Chandragupta, claiming descent from the founder of the Maurya Dynasty, consolidated the central Ganges, crowned himself Chandragupta I (r. 320-c. 330), or "King of Kings," and established the glorious Gupta Empire in 320 C.E. He conquered territory almost equal to that governed by Aśoka, but he employed a feudal decentralized authority. The golden age of the Gupta Empire was reached by the third emperor, Chandragupta II (r. c. 380-415), who added Vikramaditya to his name. With the approach of the Middle Ages, Ephthalite, or White Hun, invasions from the north challenged the now-weakened Guptas, who proved helpless against them. The Ephthalites established a kingdom in the Punjab and Rajputana between 500 and 530 C.E. but

held sway for only twenty years. A patchwork of warring Hindu states ensued, with violent wars waged for territorial control.

The first five hundred years of the Christian era, then, were characterized by partially successful attempts at reestablishing Mauryan and Gupta glory, but ancient militarism did not result in a permanent empire. Only the Mauryans and Guptas exhibited the genius of empire building. The remainder of Indian history is a maelstrom of invasions and petty struggles toward creating a recognized cultural unit of Bhāratavarṣa.

WEAPONS, UNIFORMS, AND ARMOR

Although the military history of South Asia coincides with the influx of Aryan invaders, Stone Age weaponry in the form of celts (axes), knives, and arrowheads have been discovered. Between 3500 and 3000 B.C.E. Mesopotamia and Egypt utilized weapons of copper which, a few hundred years later, were hardened with tin to usher in the Bronze Age throughout the Near East and Indus Valley cultures. The subsequent Iron Age enhanced the manufacture of weapons. In major cultural centers a highly developed art of war with land and water transport, chariots, cavalry, and iron-steel weaponry ensued. Primitive military organization and combat techniques began to surface. By the sixth century B.C.E. continuous warfare records reveal the more sophisticated military trends.

The Aryans who entered India in the second millennium B.C.E. proved formidable adversaries, skilled in warfare and bronze metallurgy as seen in spear, dagger, arrowhead, mace, and sword specimens found in the mounds of Mohenjo-daro. The most significant improvement during the early historic period, then, was the use of metal for implements of war. Metallurgical skill permitted the working of malleable metal, a skill that produced highly sophisticated weaponry to ensure conquest of the Indus River Valley.

The primary weapon was the bow and arrow, which was used from the Stone Age until the end of the Middle Ages. Four to five feet in length, the bow was constructed of bamboo, horn, wood, or metal. Its strings were made of *saṇa* fiber, hemp, skin, or animal hide. An invaluable weapon, its effective range was 100 to 120 yards, fewer if heavy, antielephant arrows were used. It was carried into battle on the left shoulder or carried aloft in the left hand. So great was its importance in ancient times that a code of rules regarding archery was ennobled as a subsidiary *Veda*, the *Dhanur Veda*. The title of *Dhanurdhāra*, or "master of the bow," was the highest accolade paid to a warrior, and the stringing of the bow was often a test of strength as with Prince Rama in the *Rāmāyaṇa*.

Arrows, fabricated from deer horn or iron, were barbed, crescent-shaped, needle-pointed, and dentiform, or serrated, and they were carried in a quiver made of hide, basket-work, or metal plates. The quiver was slung on the back and tied in front by a cross-belt. Fire-arrows and other incendiary missiles, often used against elephants, were disapproved by *smrti* writers. The *Arthaśāstra* (300 B.C.E.-300 C.E.; *Treatise on the Political Good*, 1961) of the Indian philosopher Kauṭilya (fl. 300 B.C.E.), a treatise on Indian polity from the Mauryan period, stressed the value of birds and monkeys to carry fire to enemy rooftops. Arrows tipped with metal and poison were used but were also condemned in religious texts.

Warriors also used a variety of hacking, stabbing, and felling weapons in the form of pikes, lances, spears, and battle-axes, as well as an assortment of swords, daggers, and javelins. The javelin, or *śela*, used by the infantry was highly praised, and a special long lance, the *tomara*, was used by warriors mounted on horses or elephants. Swords were double-edged, thick and heavy, and always borne in the hand. Sabers, on the other hand, were short-bladed, curved, single-edged, and worn on the left side. The *mushṭika*, a dagger of varied shape and form, was especially favored by the warriors. Siege machinery in the form of artillery, battering rams, and ballistae for hurling rocks, boiling oil, melted rosin of the *sal* tree (*kalpala*), and fire-tipped darts became common during the Mauryan period.

Besides traditional weapons, charioteers and infantry used a *nāgapāśa*, or lasso, to snare the enemy, as well as a boomerang that returned to the spot from which it was thrown.

Hindu warriors wore protective armor for head, torso, and legs, usually fabricated from leather reinforced with metal. Helmets, which had generally appeared by the Middle Ages, as well as breastplates and greaves, to protect the leg below the knee, were made entirely of bronze and iron. Prior to the Middle Ages warriors had depended on the thick folds of a turban to protect the head. To protect hands and arms from bowstring friction, leather guards were used. A wooden or wicker shield covered with buffalo or rhinoceros hide was carried in the left hand on the left arm. Archers without shields were protected by a front rank of oblong or circular shield-bearing javelin throwers. By the Middle Ages coats of mail were common protective gear for both man and beast.

North Wind Picture Archives via AP Images

The Indian prince Porus is defeated by Alexander the Great at the Battle of the Hydaspes (327 B.C.E.), during the ancient Vedic period of Indian history.

Around the sixth century B.C.E. two decisive war machines appeared, namely the chariot, which developed after the Persian invasions, and the war elephant, which was considered as valuable as the chariot.

Elephants were outfitted with a housing, or howdah, covered with cloth or carpet and bells around the neck and rump. Lower-ranked warriors armed with bows and other missiles were seated in the howdah. According to the Greek historian Megasthenes (c. 350-c. 290 B.C.E.), who was sent as a representative to the royal court of India, three archers and a driver rode on each elephant.

Primary reliance was placed upon the chariot, or *śaṭangaratha*, a two-wheeled, open vehicle similar to those used in other ancient cultures. Drawn by horses, the chariot became a decisive fighting instrument in Indian warfare. Chariot wheels were occasionally outfitted with scythe-like blades projecting from the axles, making the chariot a most dangerous weapon. Sanskrit literature describes chariots ornamented with precious materials and armed with an array of weapons. Large numbers were used in battle. Battalions of 405 infantry, 81 chariots, and 243 horses are commonly described in Sanskrit literature.

Cavalry armed with lances and short swords dominated the warfare of North India, whereas infantry was most important in South India, because southern geography and climate did not support the raising of sufficient horses for large cavalry units. Most of the superior horses of southern India were used for chariots. Although cavalry gave way to more disciplined and maneuverable infantry in Asia, India continued to rely heavily upon cavalry. India generally lagged behind other civilized cultures in military development. Its major contribution to military technology was the stirrup, which provided lancers stability in the saddle and was used by the Indian army as early as the first century B.C.E.

Military Organization

The Hindu army consisted of various categories of warriors but its backbone of seasoned hereditary troops were the *Kṣatriya* professionals. Its ranks were filled by southern mercenaries from Chēra, Karnata, and other areas; troops that generally protected caravans or trading posts of *śreṇi*, or merchant guilds; troops supplied by subordinate allies; army

deserters; and wild guerrilla tribesmen. All castes were incorporated into the army, but *Kṣatriya* represented the warrior par excellence. Brāḥmans held high military ranks, whereas the lowest two castes, Vaiśya and Śūdra, fought as auxiliaries. Warriors were arranged according to the clans and districts to which they belonged. During the Vedic period, all free men were subject to military service, but this obligation vanished as caste rules solidified. After the Mauryan period general conscription was rare.

The army was divided into four sections, the whole forming a *caturangam*: elephants, chariots, cavalry, and infantry. Elephants, the first line of defense, were trained with extreme care and utilized as battering rams, to frighten horses, to trample troops underfoot, and to ford rivers. Although they were difficult to wound, they were protected by infantry. However, there was constant danger that elephants could easily be unnerved by fire and panic. When Porus used them at the Battle of Hydaspes in 326 B.C.E., he used between 85 and 200 elephants to shield his infantry and then used his cavalry, which Alexander the Great drove back on the elephants who were, in turn, driven back on the infantry. In spite of these occasional disasters, elephants were used well into the nineteenth century by later Muslim monarchs.

The cavalry, long considered indispensable, were the shock troops in the time of Porus. However, gradually they were less and less used, and by medieval times they proved to be a weak element in Indian armies. The mounts were often wretched, failed to cover great distances, and proved vulnerable to mounted invaders from the northwest. They were not relied upon to any great extent. Chariots, on the other hand, were major fighting units in the Vedic period. They were used widely in Mauryan armies but by Gupta times, the light two-horsed car had evolved into a larger, more cumbersome transport vehicle.

The strength of the army rested in the infantry. In most Indian kingdoms an elite corps was pledged to protect the king to the death. Generally, however, they represented a miscellaneous horde of men that fell upon an enemy without any method or concerted plan. Each recruit usually provided his own mount and also received a stipend for himself and for the upkeep of his horse. Undisciplined mercenaries often deserted. Some reference is made to armies having mutinied in face of the enemy until pay was received. Yet the infantry, numerically the army's largest contingent, represented its main strength and was relied upon heavily.

Thousands of noncombatants also accompanied the fighting force to battle. They were especially evident in disorderly camps pitched during campaigns. Soothsayers, astrologers, dancers, prostitutes, acrobats, quacks, merchants, cooks, fakirs, religious mendicants, entire families of the fighting men, and royal family, wives, and concubines often slowed the pace of the army. The *Arthaśāstra* speaks of physicians and veterinarians attached to the army to care for man and beast.

The size of the Hindu army usually was enormous. In ancient and medieval times, according to various sources, the army engaged 600,000 to 900,000 men, although these figures are clearly exaggerated. The king led his army personally into battle. Under him were a number of superintendents with a *senāpati*, or general, at the head of all military affairs. The Mauryan army, according to Megasthenes, was organized under a committee of thirty with subcommittees that controlled infantry, cavalry, chariot, elephant, navy, and commissariat elements. Captains from feudal nobility served under the general. Standards identified all regiments, divisions, and squadrons.

DOCTRINE, STRATEGY, AND TACTICS

Three reasons are given in the *Arthaśāstra* for pursuing war: *dharmavijaya*, or victory for justice or virtue; *lōbhavijaya*, or pursuit of booty and territory; and *āsuravijaya*, or incorporation of territory into that of the victor and political annihilation. The Mauryan kingdom waged wars for glory and homage rather than wealth and power. The Guptas, on the other hand, stressed political annihilation and incorporation of territory. However, *dharmavijaya*, or victory for justice, was the ideal that Hindu kings were expected to pursue. War, however, became a sport of kings, profitable and always serious. Defeat was usu-

ally expunged by suicide. Dravidian South India, never fully influenced by Aryan culture, waged wars of annexation. Captives and noncombatants were treated with ruthlessness, but the ideal of *dharma-vijaya* was still present.

War was considered a religious rite, the highest sacrifice of a warrior. Battle was preceded by purification rituals, and astrologers determined the time and day for battle. The *Arthaśāstra* advised the employment of elephants and infantry in the center; light infantry, chariots, and cavalry on the wings; and archers behind spearmen. Emphasis was placed on single combat between selected warriors, but mass encounter of rank and file proved decisive. Morale was provided by leaders; if a leader was slain, the army generally fled. Elite *Kṣatriya* warriors were expected to fight to the death. Prisoners were treated honorably, usually released upon payment of ransom or after ransom was fulfilled by labor. Massacre was deprecated in Sanskrit literature.

The king and his nobles, the *rājanya*, fought from chariots. Infantry marched along with charioteers to the accompaniment of martial music that inspired them toward victory. Laying siege was considered dangerous and was rarely pursued. Generally a town was attacked and starved into capitulation.

Armies met each other face to face, approaching in parallel lines, infantry in the center, with chariots and cavalry on the flanks. Swarms of archers and slingers approached in the foreground, raining harassing fire with shouts and clashing of arms. The usual objective was to outflank an enemy, because the ten to thirty ranks of infantry were deemed vulnerable. Until 700 B.C.E. chariots provided the striking force, and the infantry provided a solid base around which more important groups could operate. Little organization was present, because the primary objective was to reach a suitable battle site and overwhelm the enemy. When charioteers struck terror in the enemy, the battle resulted in a rout. Usually each side converged and fought for an hour or more until one side would sense defeat. After 1000 B.C.E. more order, discipline, and organization entered the military system.

India generally lagged behind other civilized cultures in military theory, strategy, and tactics up to the dawn of the common era. Although training and discipline were well known to the Hindus, they found it difficult to impose military fundamentals upon the troops. The *Arthaśāstra* of Kauṭilya became the primary guide for military organization, tactics, ethics, and doctrine well into the medieval period.

Ancient Sources

Early Indian literary sources such as the *Rigveda*; the *Mahābhārata* (c. 400 B.C.E.-200 C.E.; *The Mahabharata*, 1834), including the *Bhagavadgītā* (c. fifth century B.C.E.); and the *Manusmṛti* (compiled 200 B.C.E.; *The Laws of Manu*, 1886) describe the power of weaponry, the religious duty of war, the importance of strong leadership, and the ethical aspects of waging war. The comprehensive Mauryan *Arthaśāstra* of Kauṭilya, composed between 300 B.C.E. and 300 C.E., looked upon war as a "continuation of polity by other means," as a legitimate last resort for achieving the aims of government and not to be embarked upon lightly. Although earlier literature had stressed a warrior's *dharma*, or duty, the motive of the *Arthaśāstra* was the establishment of a great empire. Around 500 C.E. the *Śiva Dhanur Veda*, of unknown authorship, stressed the skills of archery and military science in general. Its importance is seen in the application of the term *Dhanur Veda* to all writings on the art of war. There are also many battles, albeit largely men and monkeys against demons, in the *Rāmāyaṇa*, but it still contains some important military concepts. The major non-Indian source is Arrian, the *Anabasis Alexandri* (early second century C.E.; *The Campaigns of Alexander*, 1893), which contains detailed descriptions of the Indian commander Porus at Hydaspes.

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George Hoynacki

THE MEDIEVAL WORLD

THE MEDIEVAL WORLD

THE ROMAN LEGACY

Byzantium

Dates: 312-1453 C.E.

Political Considerations

In 312 C.E. Constantine the Great (c. 272 to 285-337) won a key battle at the Milvian bridge outside Rome that ensured his domination over rivals in the Roman Empire. The victory relied on Roman divisions who counted numerous Christians among them, and Constantine announced that his victory had been blessed by heaven when he saw a cross in the sky with the words, "By this sign you shall conquer." Constantine built a new eastern capital, in addition to the one in Rome. This city, Constantinople (modern Istanbul), was built on the old Greek colony of Byzantium, and historians regard its establishment as a capital in 324 as the beginning of the Byzantine Empire. At this time Constantine also legalized Christianity and ordered its organization, although the pagan religion was not outlawed until 385.

The early Byzantine Empire still regarded itself as part of the Roman Empire, and its legions were formed in the Roman way. In its early centuries the Empire concerned itself with the increasing Germanic, Slavic, and Hunnic invasions into the Danubian region and the western portions of the Empire, where a co-emperor remained in Rome until 476. From the east the Byzantines also faced incursions of the Persian Empire. Unlike Rome, Constantinople was able to resist the German invasions mainly due to its fabulous defense system, created by its early emperors. In contrast to the modern city of Istanbul, which spans two continents, Europe and Asia, old Constantinople was confined to the southwestern tip of a peninsula on the European side of the Bosporus Strait linking the Black Sea and the Sea of Marmara. Constantinople was bounded by the Sea of Marmara, the Bosporus, and, to the north, the Golden Horn, an inlet on the Bosporus. In the fourth and fifth centuries Byzantine emperors constructed a series of impenetrable walls, whose ruins can still be seen, across the land side from Marmara to the Golden Horn. An additional sea wall was built around the Sea of Marmara and the Bosporus to the Golden Horn, and a large boom blocked the entrance to the latter. The Byzantines, with a majority Greek population, would in fact, after the seventh century, be considered Greeks. They were the best sailors in the Mediterranean. Just as their wall held off land armies until the Fourth Crusade of 1204 and the Ottoman Invasion of 1453, their navies protected the city from sea attack.

In addition to foreign wars, the Byzantines fought civil wars against pagan generals opposed to the new Christian order and against heretical Christians associated with the old Hellenistic centers, such as Antioch and Alexandria. By the time of Justinian I (483-565),

Turning Points

324	Roman emperor Constantine builds a new eastern capital at Constantinople.
527-565	Emperor Justinian reigns, definitively codifying Roman law, waging war against the Germans and Persians, and changing the nature of the Empire from that of a constitutional to that of an absolute monarchy.
610-641	Heraclius reigns, Hellenizing the Byzantine Empire and introducing the theme system of Byzantine provinces ruled by military governors.
1096-1204	The First through Fourth Crusades are waged by Christians seeking to protect the Byzantine Empire and to recapture the Holy Land from Muslims.
1453	Constantinople is captured by the Ottoman Turks, ending the Byzantine Empire.

the religious wars had died down, but the emperor himself had almost lost his throne in the Nika Uprising of 532, which began after a fight between fans of competing chariot teams. The steadfastness of Justinian's wife, Theodora (c. 497-548), a commoner, saved the throne. Justinian continued with a glorious career, building the magnificent church of Santa Sophia, definitively codifying Roman law, and waging war against the Germans and Persians. In the last, however, he ultimately failed. Although his commander-in-chief Belisarius (c. 505-565), one of the four great generals of antiquity, regained much land in North Africa and Spain and won significant battles against the Persians, he did not restore the old Roman Empire, and those lands gained were lost just a few years after Justinian was succeeded by his nephew, Justin II (r. 565-578).

Justinian changed the nature of the Empire from that of a constitutional to that of an absolute monarchy. The emperor now bore the title "autocrat." In the early seventh century, under Heraclius (c. 575-641), the Byzantine Empire became Hellenized, with Greek replacing Latin as the official language. Although citizens of the Byzantine Empire still called themselves Romans, they were now really Greek. Heraclius also fought against the Persians in the field, winning victories that exhausted the empire's resources. In the years from 632 to 670 the Muslim Arabs, storming out of the Arabian desert and filled with religious zeal inspired by the recently deceased prophet Muḥammad (c. 570-632), easily conquered the Near Eastern and North African lands even while they fought among themselves for leadership of the faithful. The resentment of the Christian dissidents who still lived in those regions and who were tolerated by the Muslims played an important part in these defeats.

From the north the Byzantine Empire contended with the Slavic invasions of the sixth and seventh centuries that culminated in the creation of the first Bulgarian empire on both sides of the Danube. The next four centuries witnessed periods of peace and alliance alternating with wars between the Greeks and Bulgarians. During this period the Byzantine emperors established the "theme system" of Byzantine provinces ruled by military governors. During times of war the peasants of the theme manned the Byzantine army and navy. The themes of the sea embraced the islands and hence were the major contributor to the navy.

Beginning in 711 the Byzantine Empire went through its most critical internal struggle until its downfall—a period of civil war over Iconoclasm. Iconoclasts were religious dissidents who wanted to remove religious pictures and icons from the Christian service, and one of their proponents, Leo III (c. 680-741), became emperor. Even though he won important victories against the Arabs and Bulgarians, his Iconoclast views were unpopular. At the end of the century Byzantine ruler Irene (c. 752-803) restored the veneration of icons and was later made a saint in the Christian church.

In 867 Basil I (c. 812-886) established the 189-year Macedonian Dynasty (867-1056), which brought the Byzantine Empire to new heights. In the tenth century the dynasty repulsed an attempt of the Bulgarian king Simeon I (died 927), claiming to be the Byzantine emperor, to seize the capital and the throne. In 1018 Basil II (c. 958-1025) defeated the Bulgarians and incorporated their empire into his own.

However, within forty years the Macedonian Dynasty had ended for lack of a male heir, and a series of intrigues and bloody rivalries among the noble families ensued, which gave the term "Byzantine" its pejorative connotation. The conflicts of this period led to the losses of southern Italy to Norman adventurers at the Capture of Bari (1071) and of Asia Minor to the Seljuk Turks (Battle of Manzikert, 1071). Furthermore, in 1054 during the height of the struggles, the Christian church had split into Eastern and Western branches. In response Emperor Alexius I (c. 1048-1118) of the Comnenus Dynasty (1081-1118) asked Pope Urban II (c. 1042-1099) to send some Western knights to Constantinople as military assistance to heal the breach by helping the Greeks reconquer Asia Minor. The pope embraced the enterprise, with a grander vision of expanding the Christian community, calling for the First Crusade (1095-1099).

Alexius initially welcomed the knights but was unhappy to see the throngs of peasants who also took up the cross and came on crusade. Furthermore,

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The Roman emperor Constantine, who in 312 B.C.E. established a new, eastern Roman capital at Constantinople, which became the seat of the Byzantine Empire.

when the Crusaders conquered the Arab land, they would not agree to hold it as Alexius's vassals but instead set up their own feudal hierarchy under Godfrey of Bouillon (c. 1060-1100), the Crusade leader who became the king of Jerusalem. When the Muslims reconquered the Crusader states, and Western Christians launched the Second (1145-1149) and Third Crusades (1187-1192) led by kings, the Greeks became less hospitable. After the failure of the Third Crusade, the spirit declined even in the west. In the meantime there had been a family rupture in the Byzantine Angelus Dynasty (1185-1204). Alexius III (r. 1195-1203) had overthrown and blinded his brother Isaac II (r. 1185-1195; 1203-1204) and had him imprisoned with his son, Alexius IV (r. 1203-1204). In 1202 a new group of Crusaders had gathered at Venice for another attempt to retake the Holy Land. However, the project did not have enough funds to begin. The Crusaders relied on the doge of Venice to give them the needed resources in exchange for the conquest of the merchant city-state of Zara, which had recently broken away from the Venetian empire. Because of the destruction of this Christian city, Pope Innocent III (1160 or 1161-1216) abandoned the enterprise. Isaac II's son Alexius IV escaped from Constantinople and promised to finance the Crusaders further if they could help him reestablish his father's claim to the Byzantine throne. The Crusaders agreed

Byzantine Empire at Justinian's Death, 656 C.E.

to the diversion, invaded Constantinople, expelled the blind emperor's brother, and put Isaac back on the throne with his son as co-ruler. Alexius IV, however, was unable to honor his commitment to supplying the Crusaders. Furthermore, a popular uprising in the city turned against Isaac and Alexius in favor of another member of the family. After realizing that Constantinople was an even better and easier prize than Jerusalem, the Crusaders and their Venetian allies seized the city and established themselves as rulers of the empire. Baldwin of Flanders (1172-1205), sponsored by the Venetian doge, became Baldwin I of Constantinople, and he distributed the themes among his followers as vassal fiefs.

This Latin Empire (1204-1261) continued for only fifty-seven years, but the damage it did continued until the end of the Byzantine state in 1453. While Western rulers established a dozen new states in the themes of the empire, other rulers established independent realms as well. The great medieval Slavic empires—Serbia, Bulgaria, and Croatia—flourished in this age. There were several independent merchant cities, such as the Italian and Hungarian enclaves of Venice and Dubrovnik, as well as the Ottoman sultanate, which appeared in the thirteenth century and within two hundred years had steadily engulfed all of the Christian states, culminating in the conquest of Constantinople in 1453.

MILITARY ACHIEVEMENT

The key to Byzantine endurance was its magnificent defense system, beginning with the walls of Constantinople and the boom at the entrance of the Golden Horn. Added to this was the best navy in the region, which was used primarily as a defensive force. The Greeks also effectively employed both peasant infantry and noble cavalry. However, throughout its history the empire alternated between periods of military victory and defeat. It reached its heights during the reigns of Justinian and Heraclius and later during the Macedonian Dynasty, but constant civil and religious wars, popular uprisings, and internal rivalries and intrigues revealed its weaknesses and flaws. The Greeks suffered at various times major defeats at the hands of the Slavs, Arabs, Turks, Normans, Crusaders, pagan Patzinaks, and other adversaries.

WEAPONS, UNIFORMS, AND ARMOR

The most spectacular and renowned weapon of the Byzantines was Greek fire, a paraffin mixture whose exact formula remains unknown. When set aflame it could not be doused by water. Greek fire was especially effective in naval warfare when the Greeks catapulted balls of the flaming wax onto enemy ships, spreading general panic. In the last years of the empire, it was shot through tubes using a form of gunpowder. Individual sailors and soldiers carried small amounts of Greek fire in a type of hand grenade that exploded on contact. Greek fire was also used in land warfare and dropped from the walls of besieged cities against soldiers trying to scale the defenses.

At the height of the Byzantine Empire, from the sixth to eleventh centuries, the cavalry was the mainstay of the Byzantine land forces. The heavy cavalry, known as *cataphracts*, dressed in mail covering their bodies in the Persian fashion and wore steel helmets. Their weapons included swords, daggers, bows that were also borrowed from the Persians, and lances. They protected their horses with breast and frontal armor. Light cavalry and light infantry also used the bow, which was employed on long attacks. Some light infantry carried lances. Heavy infantry wore mail, as did their cavalry counterparts, and fought with swords, spears, battle-axes, and shields.

In the navy there were several classes of warships, known as *dromons*. Battleships of different sizes had sails and several banks of oars with an average crew of two to three hundred men. Seventy of the crew were marines who fought both on land and ship-to-ship. The remainder were rowers and sailors. Cruiser-type ships, *pamphyli*, were lighter, swifter, and more maneuverable, having only two banks of oars. They also fought in set battles. A special pamphylus stood as the admiral's flagship. Light ships with one bank of oars served for reconnaissance and carrying dispatches. Byzantine ships had ramming rods, which the lighter maneuverable vessels used very effectively.

MILITARY ORGANIZATION

The first Byzantine army was Constantine's Roman army, which followed the organization of the late third and early fourth centuries. These were divided into the border divisions, or *limitanei*, composed of the peasants of the region; the mobile units, or *comitatensis*, who fought in the field; and the guards, or *palatini*, the best troops. Under the emperor the highest ranks were prefects and two commanders-in-chief, or *magistri militum*, the senior for the cavalry and the junior for the infantry. However, when on independent campaign, either commander led mixed cavalry and infantry. At the end of the fourth century Emperor Theodosius the Great (346 or 347-395) settled the original commanders in Constantinople and added three more in the provinces. The commanders then operated independently, subject only to the emperor. Justinian added one more. The generals, or *dux*, of the provincial armies served under the commanders and had administrative and supervised judicial bureaus headed by chiefs, *princips*, from the imperial bureaucracy.

In principle the state subjected all Byzantine males to conscription. In practice landowners could pay to keep their peasants out of military service, and the draft affected mostly the urban population. The sons of soldiers were also regularly recruited. In fact most of the military was filled with volunteers, including foreigners and mercenaries called allies or *foederati*. Generals also maintained, at their own expense, troops called *bucellarii*, who took an oath to their leaders as well as to the emperor, thus presenting a danger to the throne. Nevertheless by Justinian's time the bucellarii had increased so much that they formed a major part of the army. The Roman army continued, with divisions composed of soldiers from regions such as Asia Minor, Thrace, and Armenia, and was held in special esteem. In the sixth century the cavalry replaced the infantry as the main force, and the financial difficulties caused by Justinian's ambitious wars and projects, together with a threat from the Russian steppe in the form of the pagan Avars, reduced the mercenary forces and increased conscription.

Heraclius introduced the theme system as a military measure to strengthen the provincial armies. Theme governors known as *strategoi*, literally generals, and division leaders, or *comes*, replaced the infantry and cavalry commanders-in-chief. Each theme provided an army *thema*, the equivalent of an army corps, divided into two or three division-strength *turmai*, about five thousand troops, commanded by *turmachs* serving both as army generals and civilian administrators in their provincial district. Smaller units included *moirai* (brigades), *tagmata* (regiments), *banda*, *pentarchies*, *pentakontarchies* (companies of forty men), and *dekarchies* (platoons of about ten men). Banda contained five pentarchies and pentarchies contained five pentakontarchies. Banda officers included *drungarii* and *kometes*. *Komes* commanded pentarchies and *pentakontarchos* the pentakontarchies. In addition special troop *kleisurai* (literally "mountain passes") commanded by *kleisuriarchs* guarded frontiers subject to invasion. If these districts became themes, the theme organization was applied. *Akritai*, the legendary frontier warriors of the Byzantine folk epics, at times fought beside the kleisurai and at other times independently. Higher officers were usually of noble rank. Each bandon had its own baggage train and accompanying noncombatants, such as slaves, servants, and physicians. The train brought engineering equipment, for building bridges and field camps, as well as siege equipment.

Apart from the theme armies there were special corps assigned to the capital. They included four cavalry tagmata named *scholarii*, *excubitores*, *hikanatai*, and *arithmos*, sometimes called *vigla*. *Domestici* commanded the first three, and a drungarius led the latter, the imperial guard. However, the real protectors of the emperors were the *hetairia*, or retinue, which had a large number of mercenaries and was led by the *hetairiarchos*. There was also an infantry tagmata, the *numeri* commanded by a domesticus, and additional infantry troops. The Constantinople soldiers fought with the emperor except for a battalion under the domesticus of the walls that always remained to protect the city.

From the sixth century the highest army commander was the strategos of the Theme of the East, and the next in rank was the domesticus of the

scholarii. In the tenth century, after the emperors no longer regularly led the army in battle and the number of themes had increased, the scholarii domesticus became the commander-in-chief of the entire army. The army strength of the Byzantine Empire varied over time, but at its maximum it was about 150,000. Although military pay was small, soldiers' rights as peasants on theme land made up for the deficiency.

After the eleventh century the losses in Asia Minor and the Balkans brought about the decline and finally the end of the theme system. Citizens could purchase exemptions from the conscription, and the number of mercenaries increased to include Slavs, Arabs, Turks, Mongols, "Latins," Germans, and Caucasians. The elite Varangian corps of the Comnenus Dynasty was composed of Anglo-Saxons. The fortunes of the empire became more precarious. In a 1204 battle with Crusaders, the mercenary army, which had not been paid, refused to fight. By the last years of the Byzantine Empire, under the Paleologus Dynasty (1261-1453), the regular organization had dissolved and the army was a patchwork of troops, mainly mercenary soldiers.

Although the Byzantine army had evolved from that of the Romans, the Byzantine navy was created afresh. The Roman fleet was hardly more than a coast

BYZANTINE EMPIRE, C. 1250

guard, and even up until the time of Justinian, the navy had played only a supplementary role. However, during the height of the empire the navy was a key part of the Byzantine military, especially in the empire's defense. The threat of the Arabs forced the Greeks to increase the size of the navy and to integrate it into the theme system. The fleet commander-in-chief was the strategos of the *carabisiani*, named after the *carabos*, a type of ship. Under him were one or two drungarii, with the responsibility of admirals although the equivalent rank in the army is similar to a modern colonel—a discrepancy stemming from the higher position of the army in the empire. Sailors came from the coastal regions and islands, the best being the Cibyhrrhaeots, from the Pamphylian city of Cibyra in southern Asia Minor. In the eighth century the Muslim caliphate moved inland to Persia and lessened the threat from the sea, after which the imperial navy declined. Because of a renewed Muslim threat in the Mediterranean in the following century, the Macedonian Dynasty paid more attention to the naval fleet. They added a third theme of the sea and established naval stations in the European themes. After the crisis of the eleventh century, the navy, as did the army, suffered a steady and eventually irreparable decline.

DOCTRINE, STRATEGY, AND TACTICS

Byzantine commanders paid detailed attention to military science. The Greeks, including emperors themselves, wrote manuals and commentary of military affairs, for example the *Strategikon* (before 630; *Maurice's Strategikon*, 1984), attributed to Flavius Tiberius Mauricius (c. 539-602), a Byzantine emperor who reigned from 582 to 602, which gives detailed information on the differences in strategies between the Persian and the Roman soldiers, as well as the intricacies and differences in their weapons and their uses. The *Taktika* (compiled c. 905; tactics) of the emperor Leo VI (866-912) was another well-studied text. The commanders studied the character of the enemy and the nature of the region for battle and applied their findings in the preparation and execution of both offense and defense. Surprisingly, the Greeks, who throughout history had been renowned for their seamanship, did not pay as much attention to naval science.

Special emphasis was laid on defense, and the Greeks used attack as their main strategy only in siege operations. Byzantine defense followed the frontier tactics of the late Roman Empire; the Greeks built fortified camps and small forts and posted troops at strategic passes and areas from which the enemy might invade. They fortified interior towns and cities and erected a chain of warning signals throughout the empire. If enemy forces succeeded in invading past the border defenses, the infantry would fall in behind them and block their retreat, while light infantry harassed their troops until the theme commander could assemble support from neighboring provinces in sufficient number to attack. In battle heavy cavalry, the main force of the army, attacked in mass formation. Light cavalry fought in quick sorties, made harassing raids, and carried out reconnaissance.

Byzantine military manuals carefully laid down the rules of field operations, but the commanders were also expected to show innovation and independence. The guiding principle in battle was to minimize casualties. Among the stratagems used to gain victory with the least loss were intelligence and espionage, negotiation, delaying tactics, ambushes, moving troops for their protection, and feigning retreat. Training, discipline, and experience enabled the Greeks to use these doctrines effectively. The Greeks knew the value of esprit de corps, rewarding special service and recognizing valor. The emperor and commanders appointed orators to emphasize the glory of courage, arousing the spirit and enthusiasm of the troops for God, Christianity, the emperor, and the Empire. Religion played a major part in the life and spirit of the troops. Greek wars were holy wars. Solemn masses were celebrated on the battlefield. Every day began with morning prayers, and the Greek battle cries were "God is with us" and "The cross is victorious."

MEDIEVAL SOURCES

There exists a large body of primary sources for the Byzantine Empire, many of which have been translated into English and published. Among the best known are the sixth century Byzantine historian Procopius's *Anekdota, e, Apokryphos Historia* (c. 550; *Secret History*, 1674), an account of the reign of Justinian I and Theodora; Michael Psellus's (1018-c. 1078) *Chronographia* (English translation, 1953) on the eleventh century; and princess Anna Comnena's (1083-c. 1148) *Alexiad* (English translation, 1928), an account of reign of her father, Alexius I, which includes Comnena's impressions of the Crusaders and the war with Patzinaks. Although these are general histories, they contain valuable information on the Byzantine military. Procopius, who was secretary to the general Belisarius, also wrote the official court histories of Justinian, which included accounts of his wars. Information about the military hierarchy of the early centuries is found in the *Notitia Dignitatum* of the fifth century and John of Lydia's (fl. sixth century) *De Magistratibus* (after 554; *On the Magistracies of the Roman Constitution*, 1971) of the sixth. Descriptions of the wars of Heraclius are found in the poetry of George Pisides (fl. seventh century).

There are a number of seventh and eighth century chronicles of the Byzantine Empire. Those of the monk Theophanes the Confessor (c. 752-c. 818) and the patriarch Nicephorus are valuable. The tenth century historian Joseph Genisius wrote about the end of the Iconoclast struggle and the first years of the Macedonian dynasty. Leo Diaconus (fl. tenth century) recounted in his history the military achievements of the emperors Nicephoras II Phocas (r. 963-969) and John I Tzimisces (r. 969-976). The chronicle of Byzantine historian John Scylitzes (fl. eleventh century) covers the years 811 to 1057. Some non-Byzantine sources important to this period include *Provest' Vremennykh Let* (twelfth century; *Russian Primary Chronicle*, 1930), partly attributed to Nestor (c. 1056-1113), and the Latin *Antapodosis* (tenth century; *Antapodosis*, 1930) of Liutprand of Cremona (c. 922-c. 972). The emperor Constantine VII (905-959) wrote on a number of subjects, including the themes. Two military manuals of this period are the *Taktika* of Leo VI and the *Sylloge Tacticorum* (compiled tenth century; *Sylloge Tacticorum*, 1938). For the eleventh century, in addition to Psellus and Comnena, there is also the *Strategicon* of Cacaumenus, a Byzantine general. John Cinnamus and Nicetas Choniates wrote on the twelfth century. For the crusades there are many Western works with tangential reference to Byzantine military affairs. Important historians of the last years of the Byzantine Empire include George Pachymeres (1242-c. 1310), Nicephorus II Phocas, and the emperor John VI Cantacuzenus (1292-1354), all of whom wrote before the fall of the empire in 1453. Those who wrote after the fall include Laonicus Chalcocondyles (c. 1423-c. 1490), Ducas (fl. mid-fifteenth century), Critobulos of Imbros (fl. fifteenth century), and George Sphrantes (fl. fifteenth century), whose description of the fall of Constantinople is a standard account.

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Frederick B. Chary

The Franks and the Holy Roman Empire

Dates: 482-918 C.E.

Political Considerations

During the last days of the Roman Empire, the Western European landscape was divided among various Germanic tribes, remaining bastions of Roman administrative rule, and surviving Roman military settlements, or *laeti*. The Franks alone were divided into at least four subgroups that competed for control with various Gallo-Roman magnates whose cities and surrounding territories comprised lands sufficient for them to be called *sub reguli*, or "sub-kings," in the sources. It is little wonder that any military commander with enough drive and power to stitch together an identifiable fabric from this crazy quilt of disarray would be hailed as more than just another king. Such a man was Clovis I (c. 466-511), a king of the Sicambrian Franks who created something approaching a unified Gaul at the point of his lance. Although this first Francia would be a heterogeneous kingdom, it would suffer from two major flaws that were principally Frankish in origin: the practice of partible inheritance among royal sons, which divided lands and encouraged disunion and often outright civil war, and the eventual usurpation of royal power by the chief executive officer of the king, the major domo, or "mayor of the palace." The former flaw acted as a check on Frankish expansion and the latter eventually led to a change of dynasty from the ruling house of the Merovingians to that of the House of Charles, or Carolingians.

Although Clovis was named consul by the eastern emperor Anastasius (c. 430-518) after gaining control of most of Gaul, this title was imperiled upon his death in 511. Clovis's four sons each received an equal portion of his holdings and spent the next fifty years battling for his inheritance. No sooner had it all fallen into the hands of the surviving son, Chlotar I (c. 497-561), than he died, redividing the kingdom once again among his own four sons, who showed even less inclination toward cooperation than had the preceding generation. Gaul was torn by incessant civil war for yet another fifty years. With the execution of the matriarch queen Brunhilde in 613, Chlotar II (r. 613-629) introduced a brief period of effective Merovingian rule.

At this point, an office originally intended to relieve the kings of burdensome daily administrative duties began to encroach on royal prerogatives. The position of major domo had been created to oversee supplies and the smooth running of the royal estates. During the turbulent civil wars, the office came to be occupied by key magnates of the realm who could bring military power to the side of their king. By the mid-600's, the Merovingian kings had begun to place more military authority in the hands of the mayors. By 687 the mayor Pépin of Herstal (r. 687-714) had defeated his rivals and solidified his rule over all Franks. Pépin's illegitimate son, Charles (688-741), later known as Charles Martel, or the Hammer, furthered the power of the position by seizing control in a palace coup in 714. The stage was now set for a contest between the king and the mayor for mastery of Francia. However, there was no contest. The later Merovingian kings, long characterized by French historians as *rois faineants*, or "fainting kings," were unable, or unwilling, to contend seriously for power. By 752 Charles Martel's son, Pépin III (714-768), known as Pépin the Short, had sent the last Merovingian to a monastery and assumed the throne as the first Carolingian king with the blessing of the Pope.

This move inaugurated an efflorescence of Frankish power under Pépin and his legendary son, Charles (742-814), known as Charlemagne, or, literally,

Charles the Great. During this period the Franks reassembled a large portion of the old Roman Empire—Gaul, Italy, and extreme northern Spain—and conquered most of Germany as well. In 800 Pope Leo III crowned Charlemagne as Holy Roman Emperor, reviving the concept of a Roman Empire and solidifying the division between the Roman Empire in the west and the Byzantine Empire in the east. By the time of Charlemagne's grandsons, and the Treaty of Verdun in 843, however, the issue of partible inheritance had once again divided the Frankish Empire and diluted its power. This fact, coupled with the in-

CAROLINGIAN EMPIRE

creasing pressure of Viking invasions, brought an end to any dreams of unity as the newly emerging concept of feudalism further subdivided the West.

Military Achievement

The Frankish legacy is one of military conquest. Clovis's accession to the Frankish throne in 482 came at a time in which there was no one overarching military presence in northern Gaul. Therefore, with a fairly small contingent of troops, Clovis was able, in 486, to conquer the Kingdom of Soissons, a sub-Roman territorial remnant under the command of the patrician Syagrius (c. 430-486), the last Roman governor in Gaul. By 491 Clovis had absorbed Paris and campaigned victoriously against Thuringian settlements in eastern Gaul. The incursion of the Alemanni into Frankish lands in 496 provided Clovis with opportunities for leadership over all the northern Franks. He used this leverage to good effect with a decisive victory that same year over the Alemanni at Tolbiac, southwest of Cologne. Although Clovis's subsequent conversion to Christianity somewhat eroded his Frankish coalition, he was still able to intervene in Burgundy, come to terms with the Alan laeti in Armorica, in present-day Brittany, and finally secure his Rhineland borders. In 507 he moved on the biggest prize: the Visigothic kingdom of southern Gaul under Alaric II (r. 484-507). In the late spring and early summer of 507, Clovis's forces crushed the Visigoths at Vouillé, killing Alaric II and opening the way for the conquest of the south. Clovis took most of the key cities in the south and the Visigothic royal treasury but could not take the province of Septimania. He finished his career of expansion from 508 to 511 by incorporating holdout Frankish subgroups in the north, notably at Cambrai and Cologne.

The sons of Clovis were mostly concerned with one another's patrimony, but they did cooperate long enough to effect the conquest of Burgundy in 534, at the prompting of the queen mother, Clotilde, herself a Burgundian princess. After the old queen died in 544, the remaining brothers gave themselves over to internecine strife. Matters only worsened with the succession of the four sons of Chlotar in 561. Only an occasional raiding campaign into Lombard, Italy, broke the monotony of civil war.

After unity was restored under Chlotar II in 613, two major developments occupied the Frankish military: the extension of control into Austrasia, the territories east of the Rhine, and the growth of the positions of the major domos, or mayors of the palace. By the 660's, the mayors of Neustria (central France) and Austrasia were openly influencing the choice of Frankish kings. In 687 Pépin of Herstal, the Austrasian mayor, was able to defeat his Neustrian rival and proclaim one king with one mayor for all of Francia. As he passed this on to his son, Charles Martel, the Franks found themselves governed by the mayor much more than the king. This was the situation when the Saracens, under leader ʿAbd al-Raḥmān (died 732), encountered the Franks near Poitiers on October 25, 732. Charles Martel, the mayor, formed his men into a defensive infantry position, and the Muslim forces, mostly foot soldiers with some cavalry, broke on the Frankish shield wall.

In the ensuing years, as the Carolingians made their rule officially royal, Pépin the Short conquered central Italy for the Pope, the so-called Donation of Pépin of 756. Charlemagne subdued northern Italy in 774 and ultimately Saxony, at the end of a bitter decades-long campaign. Frankish military power had won a realm extending from the Spanish March to the Elbe River and from the plains of Hungary well into central Italy.

Throughout this period the Franks evolved from a fragmented Germanic tribe to become the single strongest military force in Europe. By incorporating into their fighting forces the strengths of the various peoples they conquered, the Franks became so powerful that the Pope, when threatened in the 750's with Lombard invasion and Byzantine control, intentionally sought an alliance with them. By the end of Charlemagne's reign in 814, the Franks were supreme on the continent. Only the old malaise of a divided empire and the new threat of recurrent Viking raids, which challenged even the most formidable military of the era, brought an end to Frankish power. After 918 the local military agreements collectively known as feudalism would fragment both the land and the military might of Francia, as it did most of Europe.

WEAPONS, UNIFORMS, AND ARMOR

The disparate nature of Frankish armies worked against any uniformity in their appearance. The concept of "personality of the law," wherein each man was judged by his ethnic background, had military applications as well. Whether Frank, Saxon, Sarmatian, Alan, Gallo-Roman, or from some group less well known, the individual soldier would be expected to wear into combat that which conformed to his own tastes, abilities, and national dress. Any uniformity in dress or equipment would have derived from a soldier's military function, such as cavalry, infantry, or siege operator. Even after Charlemagne's rule took on the characteristics of a centralized empire, the use of territorial levies precluded uniforms. Because there was no government issue of battle dress or equipment, there could be no uniformity assured.

Despite these variations, the typical infantryman in a Frankish army most likely carried a spear and a shield. The spear could be of two types; the *hasta*, or *lancea*, was a thrusting spear for close engagement, whereas the *angon* was a shorter, barbed throwing spear with an iron housing extending down from the head to encase almost the entire length of the weapon. The typical length of the lance was about 8 feet, although longer ones are known. The angon, generally no longer than 6 feet, also could be used for thrusting, but its long, narrow shaft made it more suited for throwing. The theory behind the angon was that once it impacted the enemy's shield, its weight could not be cast off due to its barbed head, thereby pulling down the shield. Battle descriptions also tell of Frankish warriors stepping on the trailing angon shafts in order to deprive their opponents of their shields. Should the angon penetrate the opponent's body, its barbed spearhead ensured maximum damage when removed. The angon's long metal casing prevented the easy hacking away of the shaft and created quite a problem for the victim.

Frankish shields appear to have been round, or occasionally elliptical, and of 32 to 36 inches in diameter. A metal stud in the center permitted the soldier to strike his opponent with a punching motion, giving the shield offensive as well as defensive possibilities. The shield was usually made of wood, rimmed with iron or, in lesser instances, wicker covered by hides.

Swords seem to have been fairly rare in the Frankish world, as they were throughout early medieval Europe. Those that did exist were of two types: the long sword and the *scramasax*. The long sword was a double-edged weapon of 30 to 36 inches in length. Because its center of gravity was somewhat closer to the tip of the blade, it was better suited for cutting rather than thrusting motions, which may explain why the long sword made the transition from foot to mounted combat. The short sword, or scramasax, a single-edged weapon, ranged in length from 8 inches to a more formidable 16 inches. Its obvious use was for close combat, and its lethal impact could be enhanced by the judicious use of poison in its blood-gutter groove.

A favorite weapon of the Frankish infantryman, particularly in the early years of the period, was the *francisca*. This small ax, with a 16-inch haft attached to its 7-inch single-edged head, weighed only about 2.5 pounds, making it suitable for both striking and throwing. When thrown, the francisca could have an effective range of up to 39 feet on three in-air rotations; sources mention the Franks engaging their opponents in this way. In hand-to-hand combat, the francisca also worked much like a heavy tomahawk or hatchet.

TURNING POINTS

482	Clovis I accedes to the Frankish throne.
507	Clovis defeats the Visigoths at Vouillé and unifies Gaul.
687	Pépin of Herstal wins the Battle of Tertry, solidifying rule over all Franks, and unifies the office of Mayor of the Palace.
714	Pépin's illegitimate son, Charles Martel, seizes control over Frankish kingdom in a palace coup.
800	Charlemagne is crowned Holy Roman Emperor by Pope Leo III.
843	The Treaty of Verdun divides the Frankish Empire.
918	Feudalism disintegrates the Frankish Empire as Saxons and northern raiders infiltrate.

Although some sources claim that the Franks were without bows and arrows, evidence in Frankish graves indicates otherwise. Double-curved bows and arrowheads of more than 2.5 inches in length are suggested by the archaeology of the age. Frankish prelate and bishop Gregory of Tours (539-594), describing a particularly arrogant Frankish count, noted the count's habit of entering church with his quiver slung over his shoulder.

Body armor included the helmet, or *galea*, usually a variation on the simple iron cap, often without a nasal piece. The better-attired warriors would also have a *brunia*, or leather tunic covered in either ring-mail or mail of iron plates that overlapped like scales. Even as late as Charlemagne's day, the high cost of these pieces of equipment made them rare; the brunia itself could cost the equivalent of six cows in the early 800's. Consequently the vision of Frankish armies with little or no body armor has taken hold. The heterogeneous nature of the Frankish forces meant that some of their early armies contained elements of Roman laeti, who were frequently outfitted in mail. By the time of Charlemagne, the heavy cavalry, or *caballarii*, were protected by the brunia, whereas the *lantweri*, or general levy, would be less heavily armed.

Library of Congress

Charlemagne, crowned Holy Roman Emperor in 800, united the Frankish kingdoms and solidified the division between the Roman Empire in the West and the Byzantine Empire in the East.

MILITARY ORGANIZATION

Despite the general impression of early medieval warfare as undertaken by ignorant armies, the military organization of this period in Francia was quite complex. When Clovis began his career of conquest he assembled warbands of Frankish sub-kings, the armed retainers of Gallo-Roman magnates, descendants of Roman garrisons, armed colonists, or laeti, from late Imperial days, and barbarian allies. Each of these components could be expected to contribute their distinctive abilities. For example, the Alan laeti of Armorica were noted for their cavalry, the Gallo-Romans for their siegecraft, and the erstwhile Roman garrison personnel for their archery and missile weapons expertise. The end result would be an army capable of a combined-arms approach to war, as well as one that conceivably could be available nearly year-round. The army of the first great Merovingian king, Clovis I, bore a much greater resemblance to a late Roman force than to a barbarian, tribal army.

The major addition to this system, introduced in Francia during the time of Clovis's warring grandsons (c. 560-590), was the introduction of levies.

Based on a double heritage of Frankish and Roman custom, each king could call out his populace in time of war. The Franks had held that all able-bodied men owed military service and had developed a procedure for bringing this into effect. It was called the *campus Martius*, which could mean either "field of Mars" or "Marchfield." It is assumed this was originally an early spring muster of all available fighting men, but the sources indicate that it eventually became a muster of combatants at any time of the year. Warriors

DIVISION OF CHARLEMAGNE'S EMPIRE

were to bring their own equipment and supplies, because pillaging was restricted until the army reached enemy territory.

The Roman tradition was one of each landowning group supplying a man from their land to serve in the army. This was called *praebitio tironum*, and it meant that the Roman populace was accustomed to regularly furnishing troops to the government. Once again these soldiers were financed and thus equipped and provisioned by those satisfying the praebitio. The sixth century grandsons of Clovis simply accessed an old notion when they began calling up levies of troops for their incessant civil wars.

There were, however, distinctions among the levies, of which there appear to have been two types. Local levies, only affecting the *territorium* of certain cities, did not include the poor or those whose absence from farming or commerce would cause disruption to the flow of society. The city would make the determination as to who would be called up and who would be excused. General levies, on the other hand, were just that: a general call to arms of every able-bodied man. Even general levies were restricted to the areas under direct threat. The general levies, owing to the low level of military fitness among the troops, were not particularly helpful. As the Frankish presence expanded throughout Gaul and into Germany and Italy, so did the concept of local and general levies.

By late Carolingian times, the Franks had virtually re-created the old Roman praebitio tironum. Charlemagne's edict of 806 required men of a certain level of landholding to fight and those of lesser landholdings to pool their responsibility with others to share in the provision of a warrior. A man whose small landholding was not enough for him to serve personally, but who joined with others to furnish a warrior and supplies, was said to have done his military service. All this could be seen to offer great numerical potential for Frankish armies. Yet out of a possible thirty-five thousand horsemen and some hundred thousand foot soldiers available to Charlemagne, his usual victorious army numbered from fifteen to twenty thousand, at the most. Given the shrunken state of early medieval armies, however, this was more than enough to dominate.

Doctrine, Strategy, and Tactics

The issue of doctrine, strategy, and tactics to a large degree revolves around the question of how "Roman" or how "barbarian" armies in Frankish Gaul were. Once again the heterogeneous nature of Frankish forces provides a clue to the mixed viewpoints of Frankish commanders and their armies. Much of the military action in the period from 482 to 918 appears reactive and circumstantial, and thus more "barbarian," as if devised to conform to events rather than some far-sighted, state-driven strategic plan. Clovis, for example, is said to have invaded the Visigothic south because he felt angry that the Arian Visigoths should occupy an Orthodox land.

Despite this alleged barbarianism, there are certain strategic considerations that can be seen in the Frankish campaigns. Clovis seems to have intentionally sought territorial expansion and executed a systematic campaign of besieging cities after his decisive victory in the open field at Vouillé. His sons and grandsons, however, appear to have begun and finished campaigns with little more than a grand raiding objective in mind. It would not be until the era of Pépin the Short and Charlemagne that the Franks would reattain a strategic view of conquest and the reduction of rebellious peoples. With that as their objective, the Franks invested their energies in the capture of key cities, using a type of scorched-earth policy to deny the strongholds their subsistence.

The Franks seem to have been somewhat deficient in siege warfare, at least until they incorporated into their empire those who had inherited knowledge of Roman siegecraft. Generally the Franks took fortified strongholds by deceit, which required abilities of a different sort. Although there is scant mention in source literature of them doing so, Franks do appear to have been able to construct many types of siege engines. They were, however, capable of circumvallation—building walls to deny the besieged city any outside contact. Frankish supply trains consisted of large wagons and carts, called *basternae*. So thorough could be the Frankish investment that the Avars, having fortified their strongholds for a 791 Frankish cavalry attack, simply gave up when they

saw Charlemagne's approaching army with all its supplies in tow.

Frankish battle tactics included the basic barbarian charge, called the "wedge," which, in formation, was sometimes likened to the blunt snout of a wild boar, an animal generally revered by the Germans for its ferocity. As the charge was made, the Franks would let their franciscas and angons fly and would generally count on breaking the enemy's resolve in one rush. With the incorporation of other peoples and tactics in their armies, the Franks also supplemented thier cavalry with Alans, a warlike people from the steppes northeast of the Black Sea. With their practiced wheeling maneuvers, the Alani rendered the Frankish army a more diversified and dangerous fighting force. When faced with a stronger foe, the Franks would form a shield wall with their infantry and allow the enemy to beat itself into submission on it.

Toward the end of the Frankish period, as cavalry grew in prominence, the Carolingian armies were still dominated primarily by infantry. Even the advent of the stirrup did not give the horseman the leverage he would have two centuries later when the cantle enabled him to deliver a lance blow without being driven over the rump of his mount. Lances were used, as were the long swords, by the Carolingian cavalry in a downward thrusting manner.

MEDIEVAL SOURCES

Although sources are not lacking for the period from 482 to 918, many are flawed as reliable sources of information. A common problem is brevity; for example, the Viking invasions are frequently dismissed with a terse "this year the heathen ravaged." There is also a fundamental problem of worldview. The sources of the early medieval period more frequently recount facts than convey causation. They describe what happened, but not why. Despite an abundance of detail about an event, the lack of analysis often hinders a holistic understanding of the event. Information about weapons, tactics, and military matters must be gleaned from chance comments offhandedly dropped into narratives. It is revealed, for example, that as Count Leudast strode into church, he wore a mail shirt, had a bow and arrow, a javelin, and a cuirass, but his sword is mentioned only when, much later in the story, he is called to defend himself. When descriptions are offered, they can be maddeningly vague.

Nevertheless, the sources available for interpretation do include some gems of Western historiography. They begin with Gregory of Tours' (539-594) *Historia Francorum* (c. 594; *The History of the Franks*, 1927), which covers the history of the Franks to 591. A work that provides an overlapping but slightly different view is the *Liber Historiae Francorum* (1973), translated by Bernard S. Bachrach from an earlier Latin text, as well as *The Fourth Book of the Chronicle of Fredegar* (1960), translated by J. M. Wallace-Hadrill, both of which take the Frankish saga up to the time of the Carolingians. A Lombard viewpoint covering many of the same events is offered by Paul the Deacon's (c. 720-c. 799) *Historia Langobardorum* (c. 786; *History of the Lombards*). Eastern views on Frankish warfare are available in small doses in the works of the Byzantine historians Agathias (c. 536-c. 582), whose work is contained in Averil Cameron's *Agathias* (1970), and Procopius of Caesarea's (between 490 and 507 and after 562) *Polemon* (c. 551; *History of the Wars*, 1960).

A Byzantine view on the Carolingian military is found in the *Tactica* of the emperor Leo VI (866-912), once again not translated into English. The greatest of the Carolingian personalities, the Holy Roman Emperor Charlemagne, is described in Einhard's *Life of Charlemagne*, translated by Sidney Painter. Because Einhard served in Charlemagne's court, he presumably had firsthand knowledge of his subject's governance.

A vast and disparate field of supplemental study is that of the lives of the various saints from

the period. Once again, it is the accidental rather than the intentional inclusion of material that repays the search.

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Burnam W. Reynolds

The Anglo-Saxons

Dates: c. 500-1100 C.E.

Political Considerations

With the end of Roman rule over the British Isles occurring with the withdrawal of the remaining legions by order of Emperor Constantine in 410 C.E., the local populations of Britain were left to govern themselves until the Angles and Saxons arrived forty years later. The indigenous people of Britain were left without recourse to Rome for assistance. As a result of their successful invasion, the Anglo-Saxon peoples filled the political and social vacuum left by the implosion of the Roman Empire. Through their many kingdoms, the Anglo-Saxons established the political, social, and economic systems referred to collectively as the feudal system. Rather than being governed by the familiar system of oligarchy that would develop later, with its single king and numerous lords, dukes, and earls, Anglo-Saxon England had a complicated set of sometimes conflicting allegiances between local manor lords, known as *princips*; regional powers, or kings; and seven overlords (kings of East Anglia, Kent, Lindsey, Mercia, Northumbria, Sussex, and Wessex), who held the allegiance of the regional kings in their area.

A freeman, a person who owned land and slaves, ruled over a small village and could move up in a number of ways. If freemen gained wealth, they could become *thegns*. Thegns could attain higher status through birth (with the laws of primogeniture passing down the possession of large amounts of land) but also through service to the regional king. The companions (*gesiths*) obtained their wealth and status by service to the king. In time, this latter group of royalty became manor lords and other vassals. These vassals became the landed aristocracy; their interests were primarily local. They evolved into magistrates and interpreters of the king's law. The basic fact of political life, however, was that one freeman's power grew through his gaining the fealty of less powerful freemen. Successful thegns could expand their influence by alliances with other vassals, through conquest of other thegns, and through intermarriage. This extended to kingship as well. During the sixth and seventh centuries, a king's claim to his throne was usually based as much on the patronage he had built as on patrilineal descent and succession. In fact, patronage could lead to a more secure claim in the long run, as fictitious claimants to the throne were often numerous and having the backing of one's vassals was a good way to ensure a long reign. It was not until Alfred the Great's reign over Wessex and Kent during the tenth century, just a century before the Norman Conquest, that a monarchy, with the backing of the Church and the military, brought about a more unified state.

The sheriff coordinated the links between political divisions known as the kingdom, shire, and hundred. He was responsible for justice and collected fees and fines for the crown. The shire had its own system, functioning under inflexible legal procedures. A smaller subdivision, the hundred (a term of Germanic origin), had military implications: It supported one hundred warriors and their families. King Canute I the Great (r. 1016-1035), a Viking, reinstated the laws of Edgar (962-963), Anglo-Saxon laws designed to ease common grievances. Canute said that non-noble freemen, or peasants (*ceorles*), were the basis of Anglo-Saxon society and referred to them as "trustworthy." Even serfs, the lowest element of society, had a *wergeld* (a monetary value, literally, "man worth"). Although a serf was totally dependent on his lord, the lord could not, theoretically, abuse him. The serf could marry, could not be sold, and had to pay for the land he held subject to his producing food for the nobility.

Military Achievement

Warfare was a constant part of life in Anglo-Saxon England. Whether it was, as during the fifth through eighth centuries, warfare between vassals in quests for greater power, or, as during the ninth through eleventh centuries, warfare against an ever-increasing threat from the Vikings, in many important ways warfare defined the parameters of Anglo-Saxon life. That said, characterizing the military arrangements of the entire Anglo-Saxon era is impossible, because it was constantly changing and took different forms in different shires, vassalages, and kingdoms. Early vassalage relationships revolved around warriors seeking out leaders who gave them the greatest chance for advancement.

Although the Venerable Bede puts the Anglo-Saxon conquest in 449 C.E., it was actually a process that began prior to Bede's date and took more than sixty years before it was completely successful. As late as 516, Britons defeated the Anglo-Saxons at Mount Badon, but by that time the Anglo-Saxons controlled much of the southeastern section of the island. The changes taking place were not just military, though; in 597, the Anglo-Saxon king of Kent, Æthelbert, invited Augustine to establish a monastery at Canterbury, beginning a very quick conversion of the island to the newly introduced religion. It did not take long for the new religion to impact warfare. In 642, Oswald, the king of Northumbria, fought Penda, the king of Mercia, in battle at Oswestry, dying in battle and gaining martyrdom in the eyes of the Church. However, religion was not always the cause of conflict. The desire for military power was always present among the Anglo-Saxon kings. In 685, Ecgfrith, the king of Northumbria, invaded Scotland, only to be defeated by an army of Picts under the leadership of his cousin. Henceforth, Anglo-Saxon power would remain confined to England.

In 789, a Viking attack in Dorset marked the beginning of nearly three hundred years of continual raids and warfare between the Vikings and Anglo-Saxons. However, the Anglo-Saxon kings did not present a united front. In 829, Egbert, king of Wessex, already the most powerful king in southern England, conquered Mercia and forced Northumbria into submission. It would be Egbert's grandson, Alfred, who consolidated the monarchy into a single institution over all of England. However, Anglo-Saxon hegemony was anything but sure. By the late 860's, the Vikings had stepped up the level of the conflict, going from small raiding parties to a large invading army, taking York in Northumbria, and killing both the kings of Northumbria and East Anglia. By 871, the Viking army had engaged the armies of Wessex, under the leadership of their king Æthelred (or Ethelred) and his brother Alfred. Æthelred was killed, and Alfred became king. In 878, the Vikings took Wessex, forcing Alfred into hiding for eight years. By 886, Alfred had signed a treaty with the Vikings to divide England into two kingdoms, one Anglo-Saxon and one Viking. Peace between the two groups lasted until 937, when King Æthelstan of Wessex retook York from the Vikings. Ten years later, the Vikings attacked Wessex once again. At the mammoth Battle of Brunanburh, Æthelstan of Wessex won a crushing defeat against the invading army.

In 1013, another Viking invasion army landed, under the command of the Danish leader Sweyn Forkbeard. Taking London, he forced the Anglo-Saxon king, Æthelred, to flee. Sweyn died the following year, seemingly opening the door for Æthelred to return, but he died two years later. The successor to the Anglo-Saxon throne, Edmund Ironside, made a truce with Canute, resulting in a divided kingdom again. However, Edmund died shortly thereafter, leaving Canute as king of all England. In 1042, Edward the Confessor became king of England, beginning a period of increasing Norman influence.

When Edward died in January, 1066, the succession was in question. Harold Godwinson Harold, earl of Wessex, became king (Harold II) but faced claims from William, duke of Normandy, and Harold Hardrada, king of Norway. In September, 1066, Harold Hardrada invaded England, defeating Harold II's forces at the Battle of Fulford Gate, taking York, but later that month Harold II killed Harold Hardrada at the Battle of Stamford Bridge, sending his army back to Norway. While Harold II was dealing with Harold Hardrada in the north, William of Normandy landed on the southern coast of the country, setting the stage for the cataclysmic Battle of Hastings. On October

14, 1066, William's Norman forces defeated Harold II's Anglo-Saxon armies. Harold and many of his nobles were killed, and the Norman Conquest brought an end to the Anglo-Saxon era.

WEAPONS, UNIFORMS, AND ARMOR

The Anglo-Saxons employed a wide range of weapons, depending on their purpose, including spears, axes, missile weapons, swords, mail armor, nail armor, helmets, and shields. Spears and javelins were light, with long shafts and barbs on the tip. One would aim the device at the enemy and shoot the blade in his shield to limit the shield bearer's movements. The thrusting spear (winged) was stronger, could be thrown a greater distance than the javelin, and would penetrate mail and padding.

Most warriors carried a single-edged knife called a *scramasax*. This was the symbol of a freeman; it served in everyday work as well as war, appearing in several varieties. The small hand ax (*francisca*) was an attack instrument used for close quarters. It had a heavy blade and did not travel fast. The intended could catch it and throw it back against the initiator of combat. Less favored, at least early on, were the bow and arrow, whose major purpose was to hammer down the opponent's shield. The sling, although primarily a hunting tool, was used to attack unprotected parts of the body, such as the head. Later in the period, swords began to serve as a mark of status and became the most prized weapons, especially those with well-decorated hilts. The pummel diverted an opponent's sword. Neither opponent wished to hit the other's sword, fearing that his own weapon could be broken or dulled. Swords could be used to breach armor, but their main purpose was to incapacitate the enemy by breaking bones and destroying internal organs. Shields made of linden, alder, or poplar wood were almost universally carried.

Although not all soldiers could afford it, the most common form of body armor was mail, which was made by putting small links of iron together into sheets and then creating mail shirts that extended just below the waist and were short-sleeved. Later in the period, mail shirts became longer, reaching the knees and elbows. As the mail could stop the cutting edge of weapons but not the blunt crushing effects, a padded garment was usually worn beneath the mail shirt. Mail coifs, or headpieces, covered everything but the face.

THE BRITISH ISLES, C. 885

MILITARY ORGANIZATION

After the beginning of the ninth century, the threat of invasion by the Vikings was an increasing reality for Anglo-Saxon kingdoms. Military service had always been a part

of the vassalage arrangement, but its particular forms varied greatly. By the beginning of the Viking raids, the forms of military service became more standard. Although there were still professional soldiers in service of the king and a good number of mercenaries, the basic military unit became the *fyrd*, or army, which was constituted by drawing one man for each small-to-medium-sized unit of land. The particular arrangements were set out in the land-grant agreements that a thegn would have with his sponsoring lord, but normally each thegn was required to provide one *fyrdsman*.

Later, naval service was introduced on a similar basis. Larger areas, called ship-sokes, were required to provide sixty *sokesmen*, or warrior seamen, and to pay for the construction and maintenance of a warship. During peacetime, fyrdsmen had to serve four months out of the year in order to keep a sizable military force on hand in case of raids and to act as a police force. By the early eleventh century, Canute I had created a small, elite band of soldiers called *huscarls*. Although their relationship was still based on the feudal obligation, these professional soldiers lived at the king's court and received pay for their services. Huscarls were well armed and heavily armored. As they constituted a small standing army, huscarls continued in service during peacetime, performing nonmilitary duties such as collecting taxes and witnessing royal charters.

Doctrine, Strategy, and Tactics

The fyrds' strategies, like their composition, evolved over the Anglo-Saxon period. However, some general comments are possible, especially about the later period of conflict with the Vikings and the Normans, about which more information is available. After the time of Alfred, when a truly national force became a reality, the English army consisted of various forces from the eolderdoms, shires, hundreds, private sokes, and personal forces of the king and nobles. Naval forces would have been similarly derived, including the king's warships, private warships provided by eolderdoms, and ship-sokes.

The Battle of Hastings offers a case study in the ultimate form of the strategy and tactics of Anglo-Saxon warfare. The front line of the English army consisted of the king's huscarls. These were the elite warriors of the day and would have been able to blunt any advance by Norman cavalry. However, many of them were cut down by Norman spears, and this shortened their lines, as they did not want to allow lesser soldiers to weaken their lines. When the fyrdsmen failed and began to flee, the huscarls closed ranks around the king, until Norman infantry and knights broke their ever shrinking lines, killing King Harold and ending the Anglo-Saxon era at the same time.

Ancient Sources

There are a large number of primary sources on Anglo-Saxon England, most prominently the Venerable Bede's widely published *Ecclesiastical History of the English People* (731; English translation, 1723).

In addition, the Knýtlinga saga details Canute's invasion of England in 1015-1016. Asser's *Vita Ælfredi regis Angul Saxonum* (893; *Asser's Life of King Alfred*, 1906) and *Annales Cambriae* (c. 1200; *Annales Cambriae (The Annals of Wales)* in *The Anglo-Saxon Chronicle*, 1912) cover wide swaths of life in Anglo-Saxon England, which largely revolved around warfare. The seventy-three-line poem "The Battle of Brunanburh," which details the 937 English victory under King Æthelstan over a Norse-Celtic army, is contained in the *Anglo-Saxon Chronicle*, held at Corpus Christi College, Cambridge.

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Arthur Steinberg and Steven L. Danver

The Lombards

Dates: c. 500-1100 C.E.

Political Considerations

Taking their name from the Latin, *Langobardi*, the Lombards included a series of Germanic tribes that originated in northern Europe and moved south, invading Italy in 568 and establishing the kingdom of Italy from 568 until 774, when they were overwhelmed by the Franks. The name subsequently became associated with the region of Lombardy in modern-day northern Italy.

The origins of the Lombards are described in the seventh century book *Origo gentis Langobardorum* (seventh century; origin of the Lombard people), which was used by the eighth century writer known as Paul the Deacon for his *Historia gentis Langobardorum* (after 796; *History of the Langobards*, 1907). These books state that the Lombards originated in parts of southern Scandinavia—as is seen in the nature of their gods—but owing to the pressure of the population on scarce land, they moved south into modern-day Germany. The Greek geographer Strabo (64 or 63 B.C.E.-after 23 C.E.) noted that they were living near the mouth of the Albis River (River Elbe), which is borne out by archaeological evidence.

Military Achievement

It is clear that from the time of the Roman emperor Augustus (r. 27 B.C.E.-14 C.E.), the fierce fighting spirit of the Lombards was well known to Romans, with further information coming from the Roman historian Velleius Paterculus. It has been suggested that the Lombards had made a treaty with the Romans that kept them out of the Battle of the Teutoburg Forest in 9 C.E. They started consolidating their military strength, and by the mid-second century, the Lombards were living along the west bank of the River Elbe, through to the Rhineland, and focusing on expanding the lands under their control, which gradually came to threaten the power of the Roman Empire.

Their main military achievements were that they were able to take advantage of the weakness of Byzantine Italy, invading in 568 under King Alboin (r. 565-572), who had succeeded to the throne after a power struggle. Alboin had led the Lombards to victory over the Gepids, an eastern Germanic tribe, and his success caused the Romans to enlist his help in defeating King Totila of the Ostrogoths, a victory that took place in 552.

It was after this that Alboin recognized the weakness of the Romans, and he allied with the Saxons and invaded the Italian peninsula, taking Venice and then advancing into Liguria, taking Tuscany. His forces were never strong enough, however, to take fortified cities such as Rome and Ravenna, and Alboin's victory led to his ruling much of Italy for three and a half years, until he was assassinated in 572. In spite of this, the Lombards remained in control of much of Italy until 774, when Charlemagne led the Franks against them on the pretext of coming to the defense of the papacy.

Weapons, Uniforms, and Armor

In the first century C.E., the Lombards, in common with most of the other Germanic tribes, were armed with swords, axes, spears, and shields—wielding their long swords (*spatha*) like their axes, to cut and harry opponents rather than to stab and slash as the Romans did, although many wore daggers (*scramasaxes*) as well. Archaeological evidence indicates that the scabbard was often attached to a belt slung over the shoulder and then secured to the belt around the waist. The shield, usually relatively small and round, made from bronze rather than wood—and

with a spike (*umbo*) on it—was used to take blows from the opponent and was good for combat in which the numbers were evenly matched or the Lombards were more numerous than their enemy. In close combat, or when the Lombards were outnumbered, their shields were not as good as the Roman shields, which protected more of those who bore them.

The use of horses by the Lombards is an issue debated by historians, with the Lombard law issued by King Aistulf stating that all wealthy Lombard warriors should have a horse, and those who were unable to afford a horse should be able to use a bow and arrow. The Ostrogoths were known to deploy dismounted archers, and this was probably the case with the Lombards as well.

As to horses, certainly the royal bodyguards and retainers had their own horses, and when fighting the Franks the Lombards used horses more often in battles. In May, 2008, archaeologists working on a sixth century site at Testona, near Turin, uncovered the grave of a twenty-five-year-old Lombard warrior who had been buried with his horse. The skeleton of a hunting dog was also found nearby. Although there was heavy reliance on horses, it seems that, like the Anglo-Saxons, the Lombards used their horses largely for getting to battlefields and around battlefields, with much of the fighting taking place on foot, although some fighting on horseback was inevitable. Certainly a surviving letter from Lupus of Ferrières to Bishop Pardulus of Lyon in 849 noted that the writer was unable to carry out his duties as an infantryman and cavalryman, suggesting that Lombard fighters were trained in fighting both on foot and on horseback.

Although chiefs wore some armor (often only breastplates), for much of their period in Italy the Lombards, who relied heavily on their speed and mobility on the battlefield, did not do so. However, a gilded copper repoussé helmet plaque from the late sixth century depicting King Agilulf does show guards to a king wearing armor in plates—possibly iron or leather, and with helmets that have plumes on their tops. Some carvings of Lombard civilians show them wearing tunics with belts, in the Roman fashion, but it appears that warriors wore much heavier tunics, sometimes protected by leather pads, and also trousers that were tied up with leggings.

Military Organization

Regarding the military organization of the Lombards, it is known that certain families owed their position in society to their being related to the bodyguards of the king; these bodyguards were well trained and fought as a cohesive unit in small engagements. By the eleventh century, the men in this unit were often dressed in chain mail and were influenced in their military planning by their battles with the Normans.

In larger battles the Lombards relied on numbers of less well-armed men drawn from villages, either as volunteers or as conscripts. In the periods of the barbarian invasions, these warriors were involved in regular fighting and could form themselves into effective fighting units with ease. As time progressed, however, and the Lombards came to control much of Italy, their military organization became more relaxed; this is what allowed them to be overwhelmed so easily by the Franks.

Doctrine, Strategy, and Tactics

Before the sixth century, the Lombards formed themselves into large raiding parties and skirmished extensively with the rival Germanic tribes. However, for the invasion of Italy they had to form a much stronger military unit in order to be able to defeat their opponents. In battle, they relied heavily on mobility, and often a large proportion of the soldiers were cavalry—Lombard leaders tending to downplay the importance of archers. This battle strategy often involved the Lombards charging their opponents, with the aim of forming a wedge in the enemy lines.

As the Lombard kings changed from being invaders to being rulers who governed large areas in Italy, the tactics in battle changed, with more and more Lombards fighting on foot. By the eleventh century, the Lombards had started to adapt to new military tactics, and in battle they tended to revert to the Norman tactics of a shield wall for the infantry, with the cavalry, backed by archers, sent against their opponents.

MEDIEVAL SOURCES

There are a number of sources on the Lombards, the most well known being that by Paul the Deacon, *Historia gentis Langobardorum*, which in turn drew heavily on the *Origo gentis Langobardorum* from the seventh century. Other information comes from a range of contemporary accounts, such as that in the *Codex Gothanus*, which dates from about 830. Further descriptions come from Frankish, Norman, and other accounts by the Lombards' adversaries.

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Justin Corfield

The Magyars

Dates: c. 500-1100 C.E.

Political Considerations

During the period from 500 to 1100, the Magyars, or Hungarians, underwent immense political and social transformations. Prior to their settlement in the Carpathian basin in 895 or 896, the Magyars lived a nomadic lifestyle on the southern steppes of modern-day Russia and Ukraine. Traditionally, the Magyars were said to have consisted of seven tribes, and though each tribe had its leaders, the tribes were held together in some form of tribal confederation. Around the middle of the ninth century, the Hungarians moved farther west between the Dnieper River and the lower Danube, known as Etelköz.

Pressure from another nomadic group from the east known as the Pechenegs forced the Magyars into the Carpathian basin, where they eventually established themselves as overlords of the native population. The arrival of the Magyars into the Carpathian basin is traditionally termed "the Conquest" in Hungarian historiography. Initially, the Magyars continued the practice of conducting raids, some of which ranged as far as Iberia and Italy. However, exposure to the settled peoples of the Carpathian basin, combined with a series of serious defeats at the hands of Otto I the Great in the west (Augsburg, 955) and Byzantine and Bulgarian forces in the south (Arcadiopolis, 970), ended the practice. The last decades of the tenth century and the first decades of the eleventh saw a series of wars for supremacy among the Magyars themselves. Stephen I (István; r. 997-1038), with the help of knights brought in the entourage of his Bavarian wife Gisella, defeated the other Magyar tribal leaders, and established the dominance of the Árpád clan. Stephen also set the Hungarians on the course of becoming a Western-oriented kingdom based on Catholic Christianity.

Military Achievement

The Magyars established themselves within the Carpathian basin during the Conquest, and from there they staged raids across western and southeastern Europe. After the civil wars, the Árpáds under Stephen gained supremacy over the other tribes and created a Western-oriented kingdom. Stephen's victory over the other Magyar tribes fashioned a viable state that eventually became fully integrated into Europe.

The Magyars conducted raids against Bavaria, Moravia, and Bulgaria while they still lived east of the Danube in the 880's and 890's. The Carpathian basin was, therefore, not unknown to them. In 895-896, the Magyars came under attack by a neighboring nomadic group called the Pechenegs. By 899, the Magyars began the first of the great raids on western Europe when Arnulf of Carinthia paid them to conduct raids on his enemies in northern Italy. With each year, the Magyars raided farther into western Europe, crossing the Rhine for the first time in 911 and raiding Burgundy in 913. Almost yearly raids sent the Magyars as far as the Iberian Peninsula, where in 942 they attacked both Andalusia and Galicia. The period of raids came to an end, in part, because of two significant defeats inflicted on the Hungarians. In 955, a Magyar army crossing Bavaria was destroyed by Otto I at Augsburg, and in 970, a Magyar army suffered an equally significant loss to the combined Bulgarian and Byzantine army at Arcadiopolis.

Following these defeats came a series of civil wars in which the descendants of Árpáds established primacy over the other Magyar tribes. The main actors in the rise of the Árpáds were Prince Géza (died 997) and his son Stephen, or István, who was crowned king of Hungary in 1001. Stephen had married Gisella, the daughter of the duke of Bavaria, and sev-

eral German knights in her entourage lent their service to the rising Stephen. After Stephen I's death in 1038, the new kingdom underwent a series of wars for the throne. During the course of these wars, the German emperor invaded three separate times in attempts to put his protégé on the throne. The kingdom withstood the crisis, but German intervention was a continuing threat until 1077, when László I (r. 1077-1095) came to power. A stabilization of the kingdom occurred under László, who fended off an invasion from the east by the nomadic Cumans. László also added Croatia to the crown through conquest in 1091.

Weapons, Uniforms, and Armor

The primary weapon of the Magyars was the recurved composite bow. The importance of the bow is seen in Regino of Prüm's testimony about the Magyars: "They seldom use swords, but they kill thousands with arrows." The bow is called composite because it was constructed using several materials, such as wood, sinew, and horn. In addition, the bow itself could consist of up to five different joined pieces: the handle, to which were attached the two arms, which in turn would have pieces of hardwood attached to their ends (the "horns"). All these pieces were connected using a tongue-and-groove structure. The foundation material of the bow was most often a soft wood, such as birch, and softened, degreased sinews were attached to the front (the side away from the archer) with a glue made from fish innards. On the back of the bow (toward the archer) was glued horn. The sinew and the horn provided the relatively short bows (40-47 inches, roughly 100-120 centimeters) with great strength. The "horns" provided leverage with which the archer could bend the bow even further. The bow was recurved because prior to being strung, it rested in a slight "C" shape toward the front at approximately a 35-degree angle, and only when strung would the curve be in the normal direction (toward the archer). The arrows were typically of willow, birch, or cottonwood and were around 20-24 inches (50-60 centimeters) long. The arrowheads were typically of iron and were rhomboid in shape, with a slight spine running the length. The composite recurved bow had maximum effective ranges of 500-600 feet (150-200 meters).

Though by far the most important, the bow and arrow were not the only weapons used by the Magyars. For close combat, a short lance appears to have been common, and there is some evidence of the use of mace and ax. The Magyars also used the slightly curved single-edged saber, though its presence seems to have been limited to the more prominent members of society. In the tenth century the saber was replaced among the Magyar elite by the double-edged sword. As for defensive armor, most warriors wore only leather armor, although aristocrats covered the leather with either bone or iron plate.

Military Organization

The organization of the Magyar military experienced significant transformation during the time period in question. These changes were directly the results of the transition of Hungarian society to one based on landownership and the development of a Western-style monarchy. Before the rise of the Árpád Dynasty, the Hungarians were organized into a tribal alliance of seven tribes. Some historians have held that the army consisted of the retinues of the tribal and clan leaders and that the common freeman would therefore not have participated in warfare. However, consensus now generally holds that the population was divided between free and servile, and all free males (the overwhelming majority) would take part in war. The Hungarian army during the era of the tribal alliance was divided into units of tens, hundreds, thousands, and tens of thousands. It is difficult to determine how many fighters there were among the Magyar tribes, but scholars have estimated their numbers to be approximately twenty thousand at the time of the Conquest.

The tenth and eleventh centuries saw a great transformation in the military system of the Hungarians. First Géza, then his son, Stephen, used foreign immigrant knights as their retinue. These German and Italian knights formed the elite units in the army and were completely separate from the native, Magyar units, which were still essentially mounted archers.

VIKING, MAGYAR, AND MUSLIM INVASIONS, NINTH CENTURY

After Stephen took control in the civil wars of the first part of the tenth century, the Hungarian military was reorganized. The organizational center of the army was the castle, which had its own lands and subjects to support it. This territory was known as the "castle county" and was headed by a royal official called an *ispán*. At the same time, the base of power became landownership, and common free Magyars were allowed to settle on the land of the more powerful magnates in exchange for their labor service. In

this way they became subjects of their new lords and excluded from the army. Some of the warriors, however, were settled on the castle lands and continued to serve in the army under the command of their ispán.

Doctrine, Strategy, and Tactics

Warfare provided the Magyars with a significant source of income, and Magyar campaigns were frequently raids in force with the purpose of obtaining plunder. Captives provided a significant source of income for the Magyars, as they were sold into slavery. The Magyars also commonly sold their military services to the highest bidder. Thus, in 881 Svatopluk I of Great Moravia paid the Magyars to attack the eastern Franks. In 894, the situation was reversed, and the Franks hired the Magyars in their conflict against Svatopluk. In the following year, the Magyars again served Svatopluk against the Franks.

The tactics of the Magyars were those common to other steppe nomads and centered on lightning raids, showers of arrows to disrupt the enemy, and the feigned retreat. At the beginning of engagement, the Magyars would release volleys of arrows from horseback into the enemy's ranks in an attempt to disrupt them. The Battle of Ennsburg in 907 is a clear example of the use of the feigned retreat by the Magyars. After a failed invasion of Hungary, the Bavarians sought refuge behind defensive earthworks. The Magyars drew them from behind their defenses by simulating a retreat, and the Bavarians soon found themselves surrounded by other Hungarian forces that had been well hidden and were quickly destroyed. Similarly, the Magyars defeated a Bulgarian-Byzantine coalition in 934 when a feigned retreat allowed the Hungarians to surround and destroy the Byzantine heavy cavalry. However, the feigned retreat was successful only if the enemy forces lost battle discipline while pursuing the apparently retreating Magyars. At the Battle of Merseburg (933), neither volleys of arrows nor feigned retreat was successful in breaking the ranks of the Bavarian forces, and the Magyars quickly withdrew from the battlefield rather than risk combat with the still-closed ranks of the Bavarians.

The military reforms of Stephen took time to complete, and the Hungarian military was not fully Westernized until the thirteenth century. As a result, Hungarian tactics frequently relied on the mounted archer and feigned retreat through the eleventh century. For example, it seems likely that the Magyar tribal leader Ajtony and his army fell victim to the tactics of feigned retreat and encirclement by Stephen's forces at Nagyősz in 1008.

Medieval Sources

The main literary sources regarding the pre-Conquest Magyar life and military affairs come from Muslim geographers or from Byzantine authors commenting on the steppe peoples. Unfortunately, several of the key works regarding the Magyars still await translation into English. The earliest Muslim source is the work of the Persian geographer Ahmad al-Jayhāni, who served in the Saminid court in the tenth century. Jayhāni's work is no longer extant, but portions of it can be found in Ibn-Rustah's *Kitāb al-a'lāq al-nafisah* (c. 903-913; French translation, *Ibn Rusteh: Les Atours précieux*, 1955). Portions of Jayhāni's work are also found in that of the later Persian geographer Gardizi. The relevant portions of Gardizi's *Zayn al-akhbār* (c. 1050-1053) have been translated by Arsenio P. Martinez in "Gardizi's Two Chapters on the Turks," which appeared in the journal *Archivum Eurasiae Medii Aevi* in 1982. Gardizi described the Magyars as conducting frequent raids against neighbors primarily to obtain slaves to sell to the Byzantines.

Byzantine authors provide the most detailed descriptions of Magyar warfare. Unfortunately, the relevant portions of the most important work, Leo VI the Wise's *Tactica* (c. 895-908; tactics), has yet to be translated into English. Constantine VII Porphyrogenitus's *De administrando imperio* (c. 948-952; *On the Administration of the Empire*, 1967) described the political associations of the Magyars, whom Constantine termed "Turkos."

For the transformations that occurred with the supremacy of the Árpáds, the early laws of the kingdom are very useful: *Decreta regni mediaevalis Hungariae* (1000-1526; *The Laws of the Medieval Kingdom of Hungary*, 1989 and ongoing). The chronicle composed by Simon de Kéza, *Gesta Hungarorum* (1282-1285; *The Deeds of the Hungarians*, 1999), provides a picture of the myth of the Conquest as it had developed by the thirteenth century. In his account, Simon depicts the Hungarians as the descendants of an earlier steppe people—the Huns.

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Cameron Sutt

The Vikings

Dates: c. 700-1066 C.E.

Political Considerations

The Vikings were Swedish and Danish/Norwegian. Viking homelands were made up of kingdoms divided into districts. Farmers, merchants, the rich, and the king all theoretically had equal voices in the *thing*, a political assembly, and in the hearing of land disputes and criminal cases. In reality, wealth and power led to greater influence in gatherings with few formal procedures. Sometimes the only justice was the feud or trial by ordeal. When justice seemed impossible, slighted merchants could take matters into their own hands.

Viken was an area located near Oslofjord, and the Vikingar were merchants disgruntled by tariffs levied by their rulers on goods passing across Danish waters. Rather than acknowledge their subordinate status, they went to sea as traders. Swedes sailed to Russia, the Islamic Caliphate, and Byzantium. Danes and Norwegians sailed to Iceland, Greenland, North America, and Europe.

Despite Charlemagne's establishment of the Carolingian Empire, European kingdoms were weak and disunited by feuds and rivalries—and ripe for exploitation. The modern nation-state was centuries away, and a kingdom often consisted of a town and however much of the hinterland the sovereign could hold. Besieged at Paris, Frankish king Charles III (the Simple) gave Normandy to the Viking Rollo on condition that Rollo become Christian. The Scandinavians were absorbed by the dominant French culture.

Danish Vikings ruled half of England from late in the ninth century into the eleventh century. In the Danelaw, Scandinavian lords governed under Danish law. By 1014 England was virtually under Danish rule. Knud (also Knut or Canute), known as Canute the Great, became English king in 1016, marrying Ethelred II's widow as well. By 1033 Vikings controlled England, Normandy, southern Sweden, and Denmark, the lands surrounding the Baltic Sea that provided entry to the waterways that led to Europe and Arab lands. In 1066 the Norwegian king Harold III Hardrada was defeated at Stamford Bridge, leading to the Norwegian consolidation of their gains and the end of Viking expansion.

Vikings extorted and stole and became Normans and Irish and English and Byzantines. In the North Atlantic they extended the European frontier. They influenced languages, cultures, and political institutions. They revitalized towns and commerce, making commercial centers of York, Kiev, and other towns.

Military Achievement

The first Viking raid in Britain was at Lindisfarne in 793. Within five years thereafter, the Vikings had raided in Northumbria, Wales, Ireland, the Isle of Man, the Isle of Iona, and islands off France's Aquitaine. Thus began a 250-year reign that terrorized Europeans, ending the period between the sixth and eighth centuries when Europeans experienced little external invasion and leaving Europe at the conclusion a more cohesive area with a broader awareness of a larger world.

Vikings had been for the most part farmers and traders. When they began trading in Europe they noticed that many European locations were wealthy and poorly defended, and by the eighth century trade was secondary for the Vikings, done only if the Europeans were too well armed for the Vikings to plunder with impunity. The eighth century was also a time of European disarray, a consequence of the Fall of Rome in the fifth century, and the Carolingian Empire was powerful in France and Germany but not in the rest of Europe, where Charlemagne lacked the numbers to resist the Vikings. Between 790 and 840 the Vikings used the advantage of the shallow draft

VIKING RAIDS, 790-850

of their longships to strike coastal towns and monasteries quickly, looting and departing before the locals could react. They hit coastal England and France first, moving along the rivers on later forays.

Between 841 and 875 the raids became more frequent, faster, larger, and more intense. From initial forays of three ships they grew to forays of more than three hundred ships at a time, and the Vikings plundered, killed, enslaved, and burned before departing. In 843 they wintered on foreign soil for the first time, settling in Aquitaine and never leaving it. The Danish Great Army in East Anglia established winter quarters in 873-874.

Attacks after 841 shifted to the Mediterranean. In 844 a Viking fleet hit Nantes, Toulouse, Gijon, Lisbon, and Seville before being defeated and forced back to Aquitaine. After that, another fleet hit North Africa, France, and Spain before being defeated in Italy. Vikings as permanent residents were a political threat, leading many rulers to attempt to bribe them to leave. The Vikings at this time established their Great Army, thousands organized into smaller bands that fought on their own, sometimes with each other.

From 876 to 911 the Vikings and the Great Army plundered but also began colonizing their English and French bases as well as establishing settlements

in Ireland, Russia, Iceland, and other lands they raided from England and France. In 911 Charles the Simple ended the raids by giving the Vikings Normandy. The Viking Rollo became a duke and Christianized, a vassal of the French king and the ruler of Normandy. Normans expanded to Italy and Sicily, pushing out Byzantines, Lombards, and Muslims. They established the Kingdom of Naples and Sicily, friendly to the pope and a counter to other Italian nobles.

Vikings also raided Persia and North Africa. They were in Iceland and Greenland and touched North America. With only a handful of people (Scandinavia had a population of barely one million in all), they controlled territory with millions of inhabitants.

WEAPONS, UNIFORMS, AND ARMOR

The most common Viking weapon was an ax that could be thrown or swung. The "bearded ax" had a curved blade. An adept fighter could decapitate an ox with a single blow using this weapon.

Viking spears, which were either thrust or thrown, had iron blades on wooden shafts, usually ash; they ranged from six to ten feet long. The iron blades took various shapes, from long spikes to broad leaves. A skilled spearman could reportedly throw two spears at once or catch one in flight and throw it back on target.

Swords were expensive and represented high status. They were double-edged and about thirty-five inches long. Early Viking sabers were single-edged; strips of wrought iron and mild steel were twisted and forged together, and than a hardened edge was added. Scabbards were of wood bound in leather. Later swords had homogeneous steel blades. Because weapons symbolized wealth and status as well as battle-readiness, they were often decorated with twisted wire or inlays in copper, bronze, and silver.

Wealthy Viking warriors wore expensive chainmail hauberks or byrnies, tunics reaching below the waist; these were worn over heavy cloth padding. Average fighters wore leather armor, metal plates attached to leather or cloth backing, or padded leather shirts topped by iron breastplates. Reindeer hide was more effective than mail as armor.

The helmets Vikings wore were made of iron, some of a solid piece hammered into a cone or bowl shape, others of various pieces of iron riveted or tied together with leather. The nosepieces were of iron or leather, and some face guards protected the eyes. Cheek guards were uncommon. Helmets were most likely worn only by the leaders, because they were extremely hard to make; average fighters wore hide caps. Horned helmets were not part of the Viking armory because such headgear would be unbalanced and heavy in battle while offering no protection. Horned helmets probably were used ceremonially by pre-Viking chieftains.

The typical Viking shield was circular, about three feet across. It was wooden, with a central hole for an iron handgrip riveted to the back of the shield boards. An iron boss over the hole protected the hand. Leather covered the shield, and the rim was bound with either leather or metal. Some shields were painted in simple patterns or with scenes of heroes and moments from

TURNING POINTS

793	Vikings sack Lindisfarne Abbey in northern England.
843	Vikings sack Dorestadt and Utrecht.
845	Charles the Bald, king of the Franks, pays Vikings money to retreat.
886	Last Viking siege of Paris.
891	The Vikings suffer a rare defeat at Louvain.
911	Rollo receives county of Normandy from the French king.
930	Vikings settle Iceland.
954	English expel the last Viking king from York.
1013	Danish king Sweyn I Forkbeard defeats English king Ethelred I, forcing him into exile.
1016-1035	Sweyn's son Canute rules both England and Denmark.
1066	Norwegian king Harold Hardrada is defeated at Stamford Bridge in England; William of Normandy defeats English at Hastings.

mythological stories. Around 1000, the continental kite-shaped shield, which better protected the bearer's legs, came into use among the Vikings.

The Vikings' longships used sails and oars. The builders employed overlapping planks split from trees with mallet and wedge, riveted the planks with iron, and caulked them with tarred, twisted horsehair or other animal fur. The ships ranged in length from about 60 feet to 120 feet, and both bow and stern had the same shape, allowing them to change direction without turning around. Steering was accomplished through the use of a starboard oar, not a rudder. The average speed of the longships was 10-11 knots. With frightful figureheads and red-painted sails to intimidate foes, a longship with sixty armed Vikings aboard was a fearsome weapon.

MILITARY ORGANIZATION

The early Viking formation was the *hird* (a medieval term for hearth), the lord's retinue or household or court, which consisted of the men who lived in the lord's domicile and had sworn loyalty to him—in effect, his knights. They were often countrymen attracted by the reputation of the lord for generosity or bravery, but some were more mercenary, professionals in search of the best opportunity for gain. By the thirteenth century the hird developed ranks comparable to the continental squire, man-at-arms, and knight. The hird in time of war served as the core of the army.

The country was divided into units called *hafna*, each of which had to provide a mark of gold toward the arming and manning of a ship. The ship would have a crew of forty to sixty *lithsmen*, each supplied with a spear, a helmet, and a shield. Each ship had a single mail shirt, and bows with arrows were provided at one per six benches. There may have been a rotation in service similar to that of the Saxon *fyrd*, because full-time duty would have been onerous on the estates, even with the professionals in the retinue.

During the eleventh century, the Viking military became more professional. In 1012, during the attack of Sweyn I and Canute against England, forty-five ships separated from Sweyn's fleet and promised to defend Æthelred's (Ethelred's) land in return for food and clothing. After disbanding the army, Canute maintained a standing army of forty ships. The lithsmen were professionals, unlike the draftees of the earlier age. Lithsmen received eight marks a year per oar. The system lasted until the reign of Edward, when the Danish influence faded. The Danish ships sailed away with their wealth.

Canute established the *tinglith*, or *huscarl*, which formalized the *hird*. The difference between the tinglith and the hird was that the tinglith was supported only by the king through taxes and fees on towns, which sometimes provided *butsecarles* in lieu of fyrd service. The butsecarles were mercenaries who served in garrison to safeguard a town while its men were on the fyrd.

Viking armies consisted of *drengs*, or young warriors, and *thegns*, or older crewmen. The *merkismathr* was standard-bearer (an important post because the standard was believed to have magical properties). The king's deputy was the *stallari*, or marshal. The king's retinue in the eleventh century consisted of about ninety men along with associated hangers-on and menials. The retinue broke out into *hirdmenn*, those who shared the hearth, and *gestir*, guests who received half hirdmenn pay. Gestir lived apart from the household with their own leader. They were the king's police, tax collectors, and enforcers of justice. Hirdmenn were the handpicked elite, loyal to king and the other hirdmenn—Viking knights, in a sense.

DOCTRINE, STRATEGY, AND TACTICS

Vikings had no standing army for most of the period, and their discipline was slight. There were no set fighting formations, but loyalty to the lord helped the force remain cohesive. Weapons training began with hunting, games, and raiding at an early age. The ambitious would-be warrior sought the best retinue, there to earn wealth, weapons, and fame. War became necessary as a way of keeping the retinue satisfied and keeping the warriors from shifting to rival retinues.

The principal battle method was the strong blow

North Wind Picture Archives via AP Images

An artist's depiction of a tenth century Viking raid carried out in Norse longboats.

that could break through the enemy's armor and crush bone and flesh. Where space permitted, the battle-ax was commonly used. The broad axes of the late tenth and eleventh centuries required two hands to wield, so warriors carrying these weapons were shieldless; they would hide behind the front line of fighters until, at the opportune moment, they raced into the open and attacked enemy fighters.

Through the eleventh century Vikings were foot soldiers. Their horses were small and inferior to those of the lands they attacked. Leaders sometimes had horses for rapid movement to the battle, where they dismounted to fight.

Vikings preferred to hit and run, but when forced to stand and fight they formed a shield-fort, the *skjaldborg*, preferably on a hill or with marshes on the flanks. A bodyguard stood close by the commander. The Vikings' foes drank ale or mead to fortify their courage before taking on the skjaldborg.

The battle began with the Vikings throwing a spear across the enemy line to dedicate the soon-to-be-slain foe to Odin, the chief Norse god. A rain of spears, arrows, and other missiles followed. If the two sides still were not ready to quit, one attacked the other. A wedge of twenty to thirty warriors, the *svinfylking* (boar formation), charged and either broke the enemy or initiated a general melee. When the two sides collided with thrusting spears, swinging axes, and ramming shields, neither wanted to back off. The side that broke away and turned to run left itself open to slaughter by the pursuers.

The maniacal warriors known as berserkers may have worn the skins of wolves or bears and may have fought in groups. Berserkers believed themselves protected and given supernatural powers by Odin; they drank ale infused with hallucinogenic mushrooms and attacked with no regard for any wounds they received. They often bit the edges of their

shields in battle. Some scholars have speculated that berserkers tended to be psychopaths.

It was uncommon for Vikings to engage in sea battles, and those they fought took place close to shore. Ropes tied the longships in a line facing the opposing fleet. After an exchange of arrows and other missiles, hand-to-hand fighting ensued as each crew sought to board the opposing ship. The goal was to capture, not destroy, the opposing ship, as it represented a significant investment in money, time, and resources.

MEDIEVAL SOURCES

Medieval Scandinavia lacked the literary tradition of the Islamic and Christian areas. Contemporary sources on the Vikings are mostly Anglo-Saxon or Frankish cautionary tales written between the thirteenth and fifteenth centuries. They include chronicles, sagas, skaldic epics, laws, and runic inscriptions. Runic inscriptions are the exception, being written at the time of events they describe. They are normally only a few lines long, and they are scattered both geographically and chronologically. Runic sticks are few, but rune stones are more common, with 140 in Denmark.

The other types of source are all foreign. Most of them are written in Latin in the context of a military or religious conflict with the Vikings. Annals are the chronological yearbooks written by a country's clerics about internal and foreign policy. Among them are the *Annals of the Frankish Empire*, which reports that in 808 Godfred, king of the Danes, fortified his southern border in defense against Emperor Charlemagne of the Frankish Empire. The *Annála Uladh* (entries from 431 to 1540; *Annals of Ulster*, 1895) of January, 840, mention the first foray by the Vikings: They plundered and took bishops, priests, and scholars captive, putting others to death. These annals date from the fifteenth century, but scholars regard them as reliable reports of the Viking activity in the Christian world during their era.

Also important is the *Anglo-Saxon Chronicle*, a collection of documents on Anglo-Saxon England to 1154. Some are secondary sources based on legend, but there are also firsthand accounts of Viking conquest and plundering not covered elsewhere. *Povest vremennykh let* (*The Russian Primary Chronicle*, 1930) dates from the eleventh century to the twelfth century.

Travelogues and biographies usually mention the Vikings only in passing. *Chronicon Roskildense* (c. 1138-1140; Roskilde chronicle) and *Gesta Danorum* (1514; *The History of the Danes*, 1894, 1980-1981), the latter by Saxo Grammaticus, are the two oldest histories of Denmark. Both are modeled on the work of Adam of Bremen, whose *Gesta Hammaburgensis ecclesiae pontificum* (c. 1075; *History of the Archbishops of Hamburg-Bremen*, 1959) contains, in its fourth book, *Description of the Islands in the North*, an account from Danish king Sweyn II, making it an important source for the period from 870 to 1080. The biography of Saint Ansgar deals with his missionary work in Denmark and Sweden in the ninth century. Arab travelogues include that of Ahmad ibn Fadlan, who met the Vikings on the Volga River in the tenth century. The Spanish Arab Ibn-Rustah recorded a tenth century visit to Hedeby in *Kitāb al-a'lāq al-nafisah* (c. 903-913; French translation, *Ibn Rusteh: Les Atours précieux*, 1955). Other travelers who wrote about the Vikings include Ohtere and Wulfstan.

Sagas are high medieval Icelandic tales about Norse notables. They provide information about ships, fleet sizes, and other elements of Viking society. Snorri Sturluson's *Heimskringla* (c. 1230-1235; English translation, 1844) is the progenitor of the Scandinavian skaldic (bardic) epics.

Occasional medieval legal texts have laws traceable back to the Viking era. Among them is

the *Gulatinglov*, the model for Icelandic law. It dates from before 930 but was written in the twelfth or thirteenth century.

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John H. Barnhill

Armies of Christendom and the Age of Chivalry

Dates: c. 918-1500 C.E.

Political Considerations

Most historians agree that warfare in the Middle Ages cannot be studied in isolation. By its very definition, war—organized violence by groups against other groups—reflects the societies involved and, in turn, shapes them. This dynamic was especially true in the high medieval period, when military needs fueled administrative developments in finance, organization, recruitment, supply, and the tools of government itself. Before then, however, the very deterioration of such structures would limit the forms that warfare could take. Larger cultural issues would likewise play off of, and be played upon, by war. The Christian Church spent centuries trying to restrain or redirect the violence of its newest converts, the Germanic peoples. In time, however, the Church would find itself inextricably entangled in violent endeavors. On the secular side, the cult of chivalry developed first as the expression of a new, knightly identity; once in place, this new ethos sometimes had its own power to shape the contours of battle.

Although scholarly ideas about its dominance and character are undergoing continual revision, the network of feudal relations that lay across most of Europe in this period was the hallmark of medieval politics and war. In summary, these arrangements were coming into being even during the reign of Charlemagne (r. 768-814), but their evolution was speeded by the breakup of his empire and of effective central government, coupled with foreign invasions by Vikings and Magyars. By the end of the first millennium, the Western European population's overwhelming need for protection had caused feudalism to be cobbled together in varying ways across the former Carolingian lands. The typical model of feudalism appeared thus: Men in need (vassals) would approach someone (a lord) capable of protecting them because of his already collected followers. In officially entering this lord's entourage, the vassals would swear faithfulness or fealty to that lord. The price of protection for the vassal was his own service in the lord's retinue, or mesne, as it was later called. Other obligations later became standard, but military service was the original and fundamental one. These early vassals depended on the lord for upkeep, and in the absence of a money economy, the institution of the fief evolved. Usually in the form of land, the fief provided the economic component of feudal relationships; with it, the vassal had the wherewithal to report with all the panoply of war: horse, armor, weapons, and supplies for campaign.

Military historians have recognized for some time that feudalism did not accurately describe all the means whereby medieval armies came together. The idea of the "nation-at-arms" still compelled many to answer a summons. This was as true of the Anglo-Saxon *fyrd* before 1066 as it would be 150 years later when King John (1166-1216) of England summoned even the most recently liberated serfs to repel French invaders. On the continent, King Louis VI (1081-1137) in 1124 gathered more of his vassals together to face a German attack than he had ever commanded as a feudal lord. In addition, money was never truly absent; its role in recruiting and maintaining armies continued throughout the High Middle Ages. Thus, military historians see less incongruity than do legal historians in the use and prevalence of contracts to engage soldiers in the late medieval period.

It would be difficult to overstate the reciprocal influences on each other of the Church and medieval warfare. At first, though, the Church saw little success in its efforts to curtail the violence of its members. Before the year 1000, it had already proposed

(*Continued* p. 262)

Holy Roman Empire, c. 1190

the idea of the Truce of God. The Truce endeavored to set certain days aside as inappropriate for any violence: Days of religious significance obviously dominated this agenda, thereby "officially" making large parts of the yearly calendar off-limits for warfare. The Peace of God quickly followed, which insisted that certain groups, primarily the unarmed populace such as clergy, women, children, and peasants, were also off-limits. Although both movements had limited success, constant appeals indicate how often they were violated by combatants. Such calls on the conscience of medieval warriors went unheard for the most part, but the many gifts to the church by soldiers testify to the soldiers' uneasiness about their profession.

When Pope Urban II (c. 1042-1099) preached in 1095 that Europe's knights could actually earn redemption instead of condemnation by going on armed pilgrimage to Jerusalem, he struck a more responsive chord than he had anticipated. The success of the First Crusade (1095-1099) guaranteed that generations of Europe's knights would "take up the cross" both as penance for their violent misdeeds and as a novel continuance of their profession. The Church would rail against Christians who killed Christians in wars, including even those simulations of war, tournaments, which were condemned in numerous councils. Against infidels and heretics, however, warfare was deemed more than licit; it was divinely approved. As the later Crusades not only failed to achieve similar success but also went terribly awry, as did the Fourth Crusade (1198-1204) at Constantinople, the Church found its military involvement more problematic. The Church got further involved in the development of the knightly caste, as it sanctioned some of the trappings of chivalry. The vigils that preceded formal dubbing ceremonies as well as the oaths taken by new knights seemed to confirm that the Church had indeed domesticated its most troublesome sons. Such an appearance was deceptive, though, because chivalry always remained more a secular creation than an ecclesiastical one.

In fact it ought to be remembered that chivalry was the province not only of a secular group but also of a knightly caste that was not alone on Christendom's battlefields. In the early 1100's writers such as Ordericus Vitalis (1075-c. 1142) remarked that the absence of fatalities among knights came from a mutual Christian desire to hold violence in check. This idea of brotherhood among foes continued throughout the Middle Ages. The national orders of chivalry of the fourteenth and fifteenth centuries regularly welcomed foreign members who displayed the requisite chivalric virtues. Although chivalry might restrain lethal tendencies among knights, however, it hardly mattered when aristocratic warriors met their social inferiors. With ransoms or honor rarely at stake, this combat was far more vicious and far more deadly.

Military Achievement

The conviction that the Middle Ages was above all the Age of Cavalry is primarily a legacy of the great military historians of the nineteenth and early twentieth centuries. For them, this was the military contribution, and a questionable one at that, of the Middle Ages to history. The British historian Sir Charles Oman (1860-1946) wrote of the "complete superiority of heavy cavalry" and drew a compelling picture of the massed charge of horsemen with their couched lances. Although this image continues to be propagated in film and general histories, even very good ones, military historians have revised their view of the role of heavy cavalry to one of more limited importance. Some suggested that the end of cavalry's dominance originally seemed to lie in the successes of the Swiss pikemen of the 1300's. Others focused on the Hundred Years' War (1337-1453), in which the longbow supposedly played the more decisive role. This interpretation, however, has since evolved to place more emphasis on the combined use of forces by the English to cripple the French charge. Other historians credit the Flemish infantry, who withstood the French in the opening years of the 1300's. The motion picture *Braveheart* (1995), even though it transposed the actions of Bannockburn (1314) and Stirling Bridge (1297), validated, with some dramatic license, those who credit the Scots with teaching the English the value of foot soldiers.

Historians of the Angevins and Anglo-Normans have demonstrated the pivotal role of infantry, or dismounted knights, at multiple battles. Although the mounted knight was a hallmark of the Middle Ages, he was not the period's definitive warrior.

As a result of this improved understanding of medieval combat, a better appreciation of the military achievement of the Middle Ages is possible. Rather than seeing an epoch of heedless courage and pell-mell charges that appear as an endless cycle of fruitless violence, late-twentieth century historians have come to appreciate the sophisticated answers of medieval commanders to problems that were peculiarly their own. At first, the emphasis on cavalry grew quickly because of the need to counter the mobility of Viking, Magyar, and Muslim raiders. Other military issues came into play, however, as the new feudal blocs began to compete with each other. This competition drove innovation: in tactics, weaponry, fortification, and behind the lines, in the very creation and provisioning of armies. The crucible of invasions and internal fighting honed the overall military practice of Christendom so that it was able for centuries after 1095 to field armies far away in the Middle East. The experiences of Crusader forces sharpened European armies, as veterans returned with an appreciation of the successes to be gained by discipline and practice. Although Europe would effectively give up crusading after 1291, other conflicts, especially the Hundred Years' War, would further the development of military establishments. Amending the thesis of historian Geoffrey Parker on a "Military Revolution" in the early modern period, medievalists have traced the outlines for earlier changes that might account for Europe's later military preeminence.

The Saxon Dynasty came to power in 918 in the Germanic territories of Charlemagne's former empire. Reviving not only Charlemagne's imperial title but even some of his political and military power, this dynasty managed to withstand the double threats to any medieval government: internal factiousness and external invaders. The victory of Otto the Great (912-973) at the Battle of the Lechfeld (955) confirmed their success. By the end of the medieval period—a date open to much dispute—an entirely different military and political situation prevailed. The nation-state was replacing the feudal system, permanent armies appeared by the 1470's, and Charles VIII's (r. 1483-1498) invasion of Italy in 1494 showed that old styles of warfare no longer applied against national armies wielding powerful gunpowder weapons.

Weapons, Uniforms, and Armor

Two weapons especially dominated the personal medieval arsenal: the sword and the spear. The latter was undoubtedly the most popular weapon employed, but the former was the most prized. The expense and time involved in the manufacture of swords restricted their availability and thus contributed to their importance as status symbols. Not surprisingly, those who could afford a mount also owned swords, and the sword became associated with cavalry and medieval society's elite. The long sword tended to be between 75 and 100 centimeters in length with a blade of up to 6 centimeters in width, double-edged, and counterweighted by an enlarged pommel behind the hilt. A fuller, or groove, ran much of the length of the blade's center, removing some of the weapon's weight without sacrificing any strength; the result was a sword that averaged 1.5 kilograms in weight. Some time before the tenth century, blacksmiths began to taper the blade so that it began a gradual narrowing immediately from the cross-guard. This development helped shift the blade's center of gravity closer to the hand, making the sword even more manageable. The importance attached to swords ensured their preservation across generations of owners and thus led to an increasing number of them available in the later Middle Ages. At one muster in England in 1457, swords were second only to bows in the number of weapons brought.

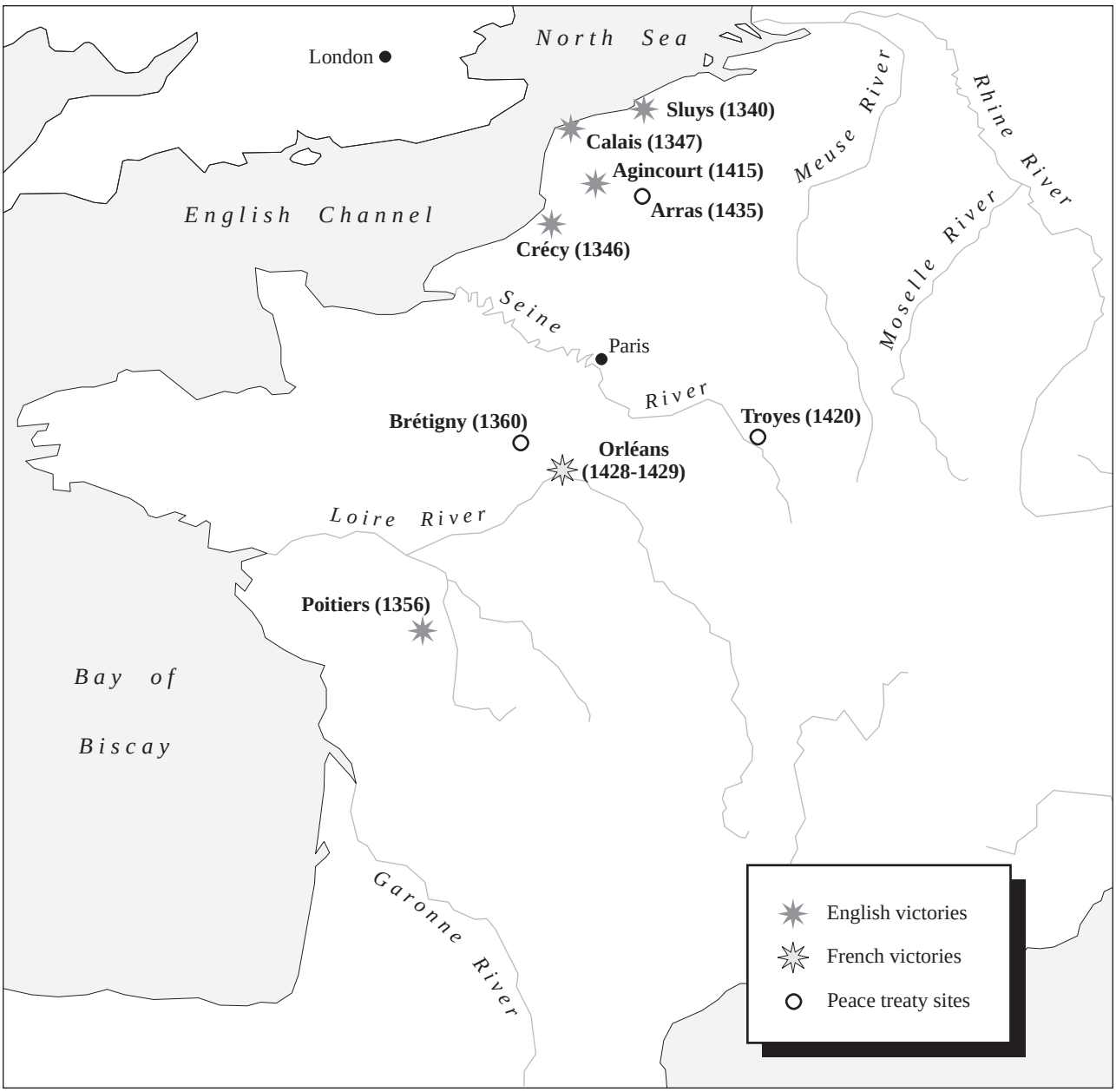
The innovations in gunpowder and armor in the later medieval period caused rapid changes in sword design. As the transition from chain mail to plate armor became more widespread after 1350, the emphasis in sword design moved from slashing to perforating. Blades grew shorter and stiffer, because the point was now the offensive part of the weapon.

For both infantry and cavalry, however, the spear

was the weapon that lay most often at hand. In the wake of some efforts at standardization by the Carolingians, spears for both branches averaged 2 meters in length, but both archaeology and contemporary art evidence a wide variety of spearheads. The basic similarity testifies that for infantry and cavalry alike it was a thrusting weapon. If the Bayeux tapestry's representation is true-to-life and not an effect of the weaving, spear shafts were rather flimsy even late in the eleventh century.

The medieval cavalry's switch to sturdier lances came with its implementation of "mounted shock

MAJOR SITES IN THE HUNDRED YEARS' WAR, 1337-1453



combat." This form of attack is the archetypal view of medieval combat: The horse-borne warrior, lance couched under his armpit, charges his enemy. The combined weight of the knight and his horse are thus concentrated in the irresistible point of the lance. At least, contemporaries saw it this way. Byzantine princess and historian Anna Comnena (1083-c. 1148) suspected that the walls of Babylon would not withstand a charge by the Frankish Crusaders she witnessed passing through Constantinople in 1095. Popular poems such as the French epic *Le Chanson de Roland* (eleventh century; *The Song of Roland,* c. 1100) painted a far more graphic, if exaggerated, picture, making reference to a knight charging his foe, cutting through his bones, and tearing the whole spine from his back.

The necessary prerequisite to such mounted combat is the stirrup, which holds the rider on his horse, and this small piece of equipment has created quite an industry among scholars trying to date its first appearance in Europe. The old assumption that mounted shock dominated the entire medieval period was unseated in 1951 when D. J. A. Ross contended that references to such assaults came no earlier than the late eleventh century *chansons de geste* such as that of Roland. Lynn Townsend White, Jr., challenged this argument a decade later when he tried to date the stirrup (and shock combat) as early as the 700's. A bevy of historians, among them Bernard R. Bachrach and David Charles Nicolle, arose to counter White's assertion, and, on the whole, their arguments have focused on the early twelfth century as the moment when mounted shock combat became the primary cavalry tactic of Christendom. To date, their contentions have carried the field.

Infantry weapons, such as the spear, remained mostly unchanged until the late medieval period. However, there were experimental modifications. King Philip II (1165-1223) of France and his retinue at Bouvines (1214) faced mercenary foot soldiers who endeavored to pull the king and his knights from their horses with hooked spears that caught their chain mail links. Unhorsed, the knights were threatened by the soldiers' daggers, which could reach unarmored areas, such as the groin or armpit. In the 1300's and 1400's the Flemish and Swiss levies began utilizing pikes in regular formations that achieved repeated victories against cavalry. Other alterations of the spear resulted from combinations: spear and ax became the halberd; the billhook had a curved blade on the side of a lance.

There was no shortage of other handheld weapons. The Vikings often used axes in battle, as did the Anglo-Saxons. The Bayeux tapestry may show one of the earliest representations of a mace, which had by the twelfth century become a popular weapon in tournament melees and on the battlefield. The dagger, like the sword, evolved in form to whatever shape was most effective at penetrating the weak points of armor.

Armies of the High Middle Ages understood the value of missile weapons and relied upon a variety of them. Slings were still used as late as the thirteenth century, especially in the form of staff slings, which propelled the missile more forcefully. For the early part of the period, short bows and composite, or Turkish, bows predominated. The latter were adopted by Christians from their Muslim foes, particularly in Spain, where the Christians even went so far as to emulate Muslims in the use of horse archers. In the Crusader kingdoms, warriors turned to native horse archers willing to fight for their new masters. The composite bow was less popular to the northwest, perhaps because the wetter climate affected the glue that held the bows together. Short bows were used by the Normans, including William the Conqueror (c. 1027-1087), who saw no dishonor in personally using the weapon. William took a great many archers with him to England, where they proved their worth by the attrition they caused in the formations of Harold II (c. 1022-1066).

The best-known bow of the Middle Ages is the Welsh longbow. Averaging 1.8 meter in length, with an exterior strip of sapwood and an interior strip of heartwood to increase its spring, the longbow was able to propel "cloth-yard shafts" from 365 to 400 meters. At 200 meters, the longbow's arrows could penetrate chain mail. After facing this formidable weapon in the thirteenth century, the English reacted by recruiting large numbers of Welshmen proficient with the bow to serve in their continental armies. The longbow had its heyday during the Hundred

Years' War, playing a large role in British victories at the Battles of Crécy (1346), Poitiers (1356), and Agincourt (1415). However, the longbow was one weapon among several that the English used wisely in conjunction with others to assure victory. The longbow's use continued with English armies until the fifteenth century, when the government simply found itself unable to ensure that there were enough bows, arrows, and archers to fill the usual complements.

The counterpart of the longbow was the crossbow, which was known throughout the period but grew in usage as siege warfare became a larger component of campaigning. From that function, it developed also into a weapon of field armies. Its potential for lethality resulted in official bans of its use by the Church in the late eleventh century and 1139. The repeated bans also testify to the fact that medieval soldiers did not give up such a weapon easily. After 1200, the Church finally approved the crossbow's use against non-Christians. Nonetheless, Christians often used it against other Christians. English king Richard I (1157-1199) was so fond of using crossbows that he was erroneously credited with introducing the weapons to the French. Experimenters improved the bow across the Middle Ages, constantly increasing its power and range while attempting to decrease the time necessary for reloading. The original wooden bow and stock became a composite bow by the 1200's and would be made entirely of steel by the 1400's. Stirrups, ratchets, and levers were all added to ease the task of drawing the bow's string back to the trigger. Load times varied between 12 and 35 seconds, but the tremendous power was sufficient to puncture even the plate armor of the later Middle Ages. The advantages of the crossbow, power combined with a low level of training necessary for accuracy, would be the same ingredients that in the later fifteenth century would enable the gun to displace the crossbow on the battlefield.

Apart from personal weapons, successful armies also employed a siege train, a collection of raw materials, prefabricated weapons, and personnel who could build and operate such pregunpowder artillery. The importance of such weapons is reflected in the complaint that the so-called artists of war, knights, had been replaced by the new specialists: engineers, miners, crossbowmen, and artillerists.

The siege weapons handled by the new specialists worked by one of three means. The onager was a survivor from antiquity in which a single beam, inserted through a horizontal braid of animal tendons or hair, was pulled back into firing position. This torsion weapon was less powerful than its classical predecessors and was immensely heavy; one reconstruction weighed nearly 2 tons. The ballista of the Romans was probably a two-armed torsion weapon, but the term referred in the Middle Ages to a tension weapon that was essentially an oversized crossbow on a stable platform. Lever machines were the third variety of pregunpowder artillery. The use of lever artillery originated in China and spread via Byzantium and the Islamic lands. Lever artillery relied on either traction power or a counterweight. In the former case, a crowd of operators hauled downward on ropes attached to one end of the lever-arm, causing it to swing on a pivot and release its projectile in a high arc. This was the *petraria*, or stone thrower. The trebuchet was the pregunpowder giant; it replaced the human hauler with a fixed counterweight that allowed truly impressive weights to be launched. Projectiles typically weighed between 50 and 75 kilograms, with a range of approximately 200 meters.

Given the impressive arsenal that both the well-to-do knights and common soldiers carried into battle, there is little wonder that medieval combatants also invested in sophisticated personal armor. The simplest, most efficient form of armor remained the shield, in use since ancient times. In the tenth century, the shield was still evolving, from a round shape to that of an elongated kite. The new shape better protected the legs of horsemen without adding too much weight. In addition, infantry could jam the shield's lower point into the ground for more stability when creating the formation called a "shield-wall." Although the shield would later be shortened, this triangular shape remained standard until the best plate armor made shields themselves redundant.

Armor itself underwent several changes throughout the medieval period. The primary body armor before 900 had been a leather jacket with metal scales attached. By the eleventh century this form of armor

had grown more complex; the Bayeux tapestry shows coats of chain mail on most of the Normans. Made up of thousands of interlocked rings, this hauberk was probably worn over a padded undergarment both to prevent chafing and to soften opponents' blows should some of the links be broken and forced inward. This form of armor, with continued improvements, would dominate Europe and the Crusader kingdoms for several centuries. Extra pieces of mail would be added for the lower legs, the back of the neck, the lower face, feet, and hands. The helmet evolved from a conical shape with only a nasal guard to the "great helm," an enveloping, metal defense for the entire head. As missile weaponry evolved, plate armor became widely adopted. Steel, which had been tested especially against crossbows, began to be combined with chain mail and later replaced it. Eventually, knights would wear form-fitting plates that covered not only all major parts of the body but also protected complex joint areas such as the knees, elbows, and even fingers. Apart from such armor's protective benefits, its gleaming qualities also appealed to those who could afford it.

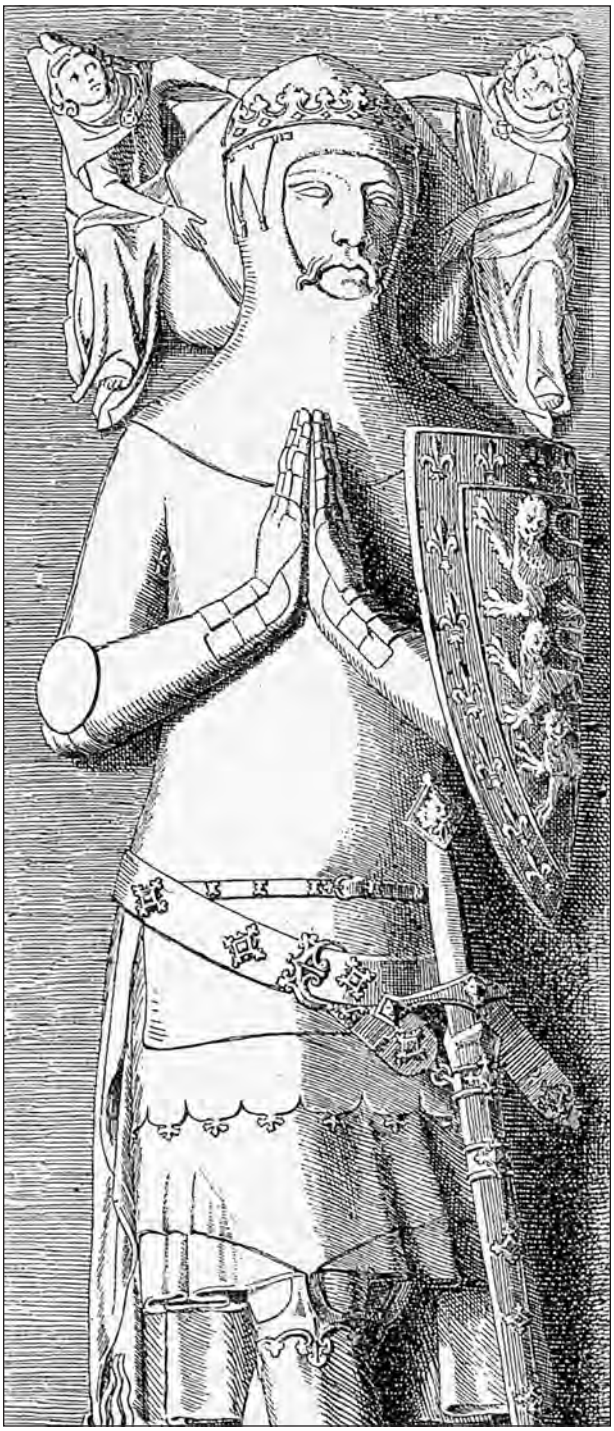
Because medieval warriors were usually responsible for outfitting themselves, there would be little use of standardized uniforms until the late Middle Ages, when powerful rulers and some cities would either provide or require them. Before that point, the emphasis fell more on individual insignia and costume. Although the Bayeux tapestry shows some painted shields, the earliest evidence for heraldic decoration comes from the reign of Stephen, king of England, also known as Stephen of Blois (r. 1135-1154). During his day, the Clare family began consistently to display its gold and red bands, and Geoffrey of Anjou (Geoffrey Plantagenet, 1113-1151) his two lions, which would in changed form become the English royal insignia. Although the participants in the Third Crusade (1187-1192) would adopt national identifiers such as differently colored crosses for the French, English, and Flemish, the real shift from personal to corporate designations came later. Wealthy cities such as Tournai were outfitting contingents in uniform livery in 1297 and again in 1340. Men from Wales and the adjoining marches wore green and white costumes and hats when serving on the Continent in the mid-1300's. As revenues increased, princes also began to outfit notable units within their forces; thus, French kings Charles VII (1403-1461) and Louis XI (1423-1483) contributed to the distinctiveness of their Scots Archers in the fifteenth century. The dukes of Burgundy would do likewise before their finances and power failed.

A turning point in medieval warfare came with the widespread adoption of gunpowder weapons. The first known recipe in Europe for gunpowder comes from 1267 in the works of Roger Bacon (c. 1220-c. 1292), more than two centuries after its first mention in Chinese texts. Within sixty years the first evidence for cannons appears in the illustrated margins of medieval texts, followed by their confirmed use at Puy-Guillaume (1338) and then against Lille (1341). Within twenty years, evidence of gunpowder artillery spread from Italy to Scandinavia and from Russia to England. The most dramatic example of the new technology was the bombard. With a weight of around 16,000 kilograms and firing balls of 380 kilograms, the largest of these giants could breach almost any wall with only several well-placed shots. On the battlefield, however, the effect of early cannons was more limited. They may have been used at Crécy in 1346 merely for the shock effect of the noise they made. The adoption by the early 1400's of smaller calibers made cannons more accurate, and a roll call of distinguished victims began.

Even though the overall battlefield effect of cannons remained negligible, the sudden vulnerability of elite warriors, the quick obsolescence of old defenses, and the new demands on military budgets spelled the end of chivalric warfare.

MILITARY ORGANIZATION

Medieval warfare, at its most proficient practice, was a sophisticated affair, marked by careful preparations, skillful analysis of risk and reward, and the use of multiple branches of service. This thesis, however, has been only recently accepted by a wide audience holding a more traditional image of feudal armies as violent mobs. The historian Oman claimed in 1885



Library of Congress

A fourteenth century English knight. In the late Middle Ages the cult of chivalry developed as the expression of a new, knightly identity, an ethos that sometimes shaped the contours of battle.

that medieval troops were neither disciplined nor unified, and this idea has been long held. The conviction that chivalric ideals were "inimical" to battlefield discipline and organization appeared repeatedly in encyclopedia articles and surveys of military history throughout the twentieth century. It was supposed that knights, ever desirous of increasing their personal glory, turned battles into giant melees of individual combats. However, closer attention to the original sources by recent scholars has shown otherwise.

Well before battle got under way, medieval knights reported to a muster less as individuals than as members of a group. At the very least, they came as part of a lord's retinue, following his banner and perhaps wearing colors or insignia indicating their corporate identity. By the 1300's, even individual knights typically reported with a coterie of aides. In fourteenth century France this group, often called a lance, consisted of two men; in the 1400's the standard composition was three. These units could then be organized as necessary into larger units called by multiple terms: banners, *conrois*, *échelles*, *batailles*, or battles. Such units were then spread in compact ranks across the perceived battlefield. The widespread use of these terms across Europe and in all vernaculars indicates such tactical units had a long history in medieval warfare.

Vernacular literature also reveals that these units stayed together compactly in battle rather than being dispersed enough to allow the individual combats supposedly characteristic of war in the Middle Ages. The *chansons de geste* (literally "songs of war") repeatedly describe the ranks of armies as being drawn up so tightly that objects thrown amid them would not have reached the ground. Latin prelate William of Tyre (c. 1130-1185) provides a particularly instructive example, describing a Crusade in 1180 to relieve the fortress of Darum. Partly out of fear and partly from lack of training, the crusading knights crowded so compactly together that their ability to launch an attack was hampered. Nonetheless, this dense group forced its way through the Muslim lines with steady pressure, rather than a dramatic charge. Their success was a testament more to their organization and discipline than to their reckless courage.

DOCTRINE, STRATEGY, AND TACTICS

A legacy of late nineteenth century medieval studies has been an appreciation of the quality of medieval military strategy and tactics. Until that time, medieval historians had been heirs to the military tradition of the decisive battle. Such historians often had been frustrated by the study of medieval military efforts, because they saw a quite random pattern of violence marking medieval campaigns. The historians could not find the decisive, battlefield resolution that they assumed was the natural goal of any expedition. The repetitive medieval cycle of raid and counterraid appeared only as senseless violence. The appearance was only made worse by the fact that medieval commanders had, in the fifth century Roman military theorist Flavius Vegetius Renatus's treatise *De Re Militari* (between 383 and 450 C.E.; *The Fovre Bookes of Flauius Vegetius Renatus: Briefelye Contayninge a Plaine Forme and Perfect Knowledge of Martiall Policye, Feates of Chiualrie, and Vvhatsoeuver Pertayneth to Warre*, 1572; also translated as *Military Institutions of Vegetius*, 1767), a reputable guide to the tactics and strategy of late fourth century Rome. Numerous copies of this work in both Latin and native dialects survive as evidence of its popularity. There is also narrative evidence that commanders such as Geoffrey of Anjou consulted Vegetius's work for instruction on building incendiary devices. At the end of the Middle Ages, the dukes of Burgundy turned to Vegetius for counsel in building new siegeworks. Although the actual influence of Vegetius has been questioned, his work nonetheless served to introduce generations of medieval leaders to larger strategic issues.

One thing that medieval commanders understood quite well on their own was the utter uncertainty of battle. It was to be avoided not from fear, but from a sound recognition that far better means lay at hand to force an opponent to the bargaining table. The Latin kings of Jerusalem avoided battle as a policy, because the price of failure would be too high. In 1187 Guy de Lusignan (1129-1194) gambled at Hattin, and Saladin's (1138-1193) resulting victory left the rest of the kingdom incapable of defense. The destruction that attended so many raids was actually part of the medieval "science of war." Far more than daredevil heroes or wanton destroyers of countryside, good commanders such as William the Conqueror and Richard I conducted strategic raids that had the cumulative effect of enfeebling the opponent at the least risk to one's own army. Richard's case is all the more dramatic; in nearly thirty years of campaigning, he fought only one pitched battle by his own choice.

There were, of course, times to seek battle, as evidenced by William the Conqueror at Hastings (1066), Frederick II (1194-1250) at Cortenuova (1237), and the French in the great battles of the Hundred Years' War. Each demonstrates a different aspect of strategy. The French doubtless felt they had met Vegetius's criteria for offering battle; they had superiority of numbers, and the foe was in pitiful condition. Their defeats at Crécy, Poitiers, and Agincourt served to reinforce the lesson of fickle fortune. Frederick II gambled in 1237 by dividing his forces, but he did so as a ruse; by convincing the Milanese that he was retiring for the winter, he engineered a devastating ambush. Under different conditions William worked to provoke Harold to battle in 1066, primarily because he could not hope to hold his invasion force together indefinitely. Many other battles, however, occurred in more accidental fashion; even though a clash was intended, Bouvines took place on a Sunday in 1214 because Otto IV's forces overtook those of Philip II more quickly than was expected.

Although anything might transpire when battle did occur, a few themes appear amid the varied actualities. Although many other elements of medieval warfare are often emphasized, knights and their potential charge remained the central concern in battles. The actual, successful delivery of such a charge as both initiation and conclusion of a battle seems to have been a rare occurrence. Of more concern were the reserve or flanking units of cavalry, which many commanders kept ready. This very disposition belies the contention of some scholars that once battle was joined, the possibility of giving orders disappeared in the chaos. The prebattle arrangement of forces varied over the years. From the eleventh through early thirteenth centuries, commanders formed several long shallow lines composed mostly of infantry but often augmented by dismounted knights. Its primary role

was to withstand the opponent's charge. In protected positions, or even in front of this first line at the very start, archers would add their missile fire so as to disrupt the enemy assault. Variations on this line would appear. The Knights Templar had a "crown" formation they adopted for defense; the Flemings at Bouvines and the Scots a century later at Bannockburn withstood charges in circular formations. As the Flemings and later the Swiss fielded large numbers of infantry in the 1300's, they utilized massive arrangements of squares and wedges with no real center. Where the defending force was not wholly composed of infantry, the concern was to break the foe's charge or at least engage it until a counterattack came from reserve or flanking units. Once a formation broke, the pursuit naturally involved the mounted units; even here, the pursuers had to take care they were not being drawn out of their formation and into an ambush by a feigned retreat. In all cases, the charging knights constituted a minority on the battlefield but remained uppermost in the minds of leaders and combatants.

MEDIEVAL SOURCES

In the area of military affairs, and most especially combat, medieval sources present a number of intersecting problems. The authoritative writers of the age were churchmen, men unlikely to have witnessed combat, particularly if they were monks. Some, such as William of Tyre or Ordericus Vitalis, are noteworthy for having obviously sifted through their informants' accounts to give posterity as full and accurate a narrative as possible. However, the details of battle often did not concern such writers; they were more interested in the miraculous than the human aspects of battle. Thus they told more of the saints who appeared in the melee than of the actual tactics employed. Moreover, because the lesson to be drawn from a military event was far more important, ecclesiastical writers tended to treat numbers with some license. Medium-sized hosts numbered 300 so often as to defy belief, whereas truly large armies appear in multiples of 100,000, numbers quite beyond the administrative capabilities of any medieval government. Further complications arose when clerics adapted terms from antiquity to refer to peculiarly medieval items.

Such problems can be occasionally resolved, however, by relying also on secular, typically vernacular sources. The documents written for the military elite help us by using more precise language. Even the fanciful world of the *chansons de geste* can be instructive if carefully culled. Such songs had a practiced, knightly audience in mind who would have little appreciated an inaccurate picture of the realities of battle, apart from the superhuman accomplishments of the heroes. The *Histoire de Guillaume le Maréchal* (c. 1225; the story of Guillaume le Maréchal) often reads like the *chansons* but rather is a biography that has been found correct in many questionable details. Many of the poem's events were clearly witnessed in person. Firsthand accounts include those of Ambroise d'Évreux (fl. c. 1190), who was at Arsuf with Richard I; Jean (or John) de Joinville (c. 1224-1317), who was at Mansurah; and Jean le Bel (c. 1224-1317), who was in Scotland. These sources provide details on tactics, strategy, and weaponry, as well as a picture of the actual experience of the medieval warrior in combat. There were moments of both fear and courage.

Finally, there is the pictorial record. The Bayeux tapestry is a uniquely rich source. Numerous medieval manuscripts, even many that do not deal specifically with military topics, abound with decorated letter forms and illustrations of combat in the margins. Awareness of the dates of such manuscripts allows scholars to refine theories on the use of certain weapons and armor. Similarly, the carvings in churches and monasteries reveal much about medieval armaments. The seals of many feudal lords are also instructive, although only for the weapons of the elite.

Where details of armaments can be discerned in these smaller figures, though, the dating is quite precise.

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Steven Isaac

Crusading Armies of the West

Dates: 1095-1525 C.E.

Political Considerations

The engine driving the Crusades began with Pope Urban II (1042-1099) in 1095 at the Council of Clermont, when he called for Christendom to rise in defense of the Holy Land. The pope had responded to Byzantine emperor Alexius I's call for assistance against Islamic encroachment in areas Christianity deemed important as part of an effort to seal the 1054 rift between Catholicism and the Orthodox Byzantine East. Beginning at Clermont, the pope called for the Holy Land's rescue and the restoration of the "Truce of God." Following his cue, clergy throughout Europe began preaching sermons and delivering calls to liberate Jerusalem and the Holy Land from Islam, spurring nobles to take up arms and undertake the long, arduous journey. Additional inducements, such as the forgiveness of sins and eternal glory, convinced many to go. An additional political motive behind the Crusades was to divert the nobility from fighting with each other. This peace, both in the Holy Land and in Europe, would serve to strengthen the Church's authority.

When the First Crusade began in 1095, the Byzantine military had declined and its forces were composed of mercenaries throughout Europe. Despite the internal decay, the Byzantine military remained a force worthy of consideration. It would provide supplies, siege columns that proved extremely useful in siege operations, and medical units that marched in the field with the fighting troops. The Byzantines also used the Varangian Guard, descendants of the early Viking settlers in Rus who had followed two Byzantine monks, brothers Cyril and Methodius (later made saints), down the Dneiper River in the ninth century and whose mission was to convert the uninformed to Orthodoxy.

Library of Congress

Crusaders under English king Richard I reach the holy city of Jerusalem.

Military Achievement

The First Crusade did not succeed, at least in part because of a lack of planning and experience. Participants and their motives varied and the prospective glories were exaggerated in order to gain general support for the ventures. Seven Crusades between 1096 and 1254 marked Crusader-Islamic relations and left a negative imprint on relations between the Islamic world and Chris-

tian Europe. Also, internal problems plagued the Crusader force; while some wanted to conquer Jerusalem, other Crusaders wished to create a fiefdom for themselves. In time, the disorganization dissipated, but distance and supplies made short shrift of any gains. Many small "Crusader kingdoms" collapsed as quickly as they came into existence from 1098 until the fall of Acre in 1291, and enthusiasm diminished with each Crusade. However, as new militant orders were created, the Crusaders finally developed a semblance of central authority and armies to combat the Islamic forces. The Crusaders, led by European nobility, had knights, archers, battle columns, squares, archers, and footmen. Each nobleman could furnish a force, but not equal to that of the combined Islamic forces, who knew how to dress for warfare in the region.

Weapons, Uniforms, and Armor

As the Crusades were waged over numerous centuries, the types of weaponry used by both sides were vast. Often, the weaponry used was haphazard and makeshift. Crusaders who were not of high social rank used whatever weapons they could get their hands on, from pikes to rudimentary clubs, which could be fashioned easily from nearly any piece of wood. The cudgel was essentially a club with metal pieces attached to it, so as to inflict more damage. A step above the cudgel were crude axes. Likewise, the maul, essentially a large sledgehammer, could do significant damage. Taking some skill on the part of the weaponsmith were the mace and the ball-and-chain. These blunt weapons could inflict significant damage, but like all weapons of this sort, they were used by the lower-class Crusaders in hand-to-hand combat.

Those Crusaders who were of higher birth had access to better weaponry. Their blunt weapon of choice was the war hammer, which came in blunt and sharpened versions. Although the evolution of weaponry during these centuries was slow, one technological innovation that had an important impact was the crossbow, which appeared in the eleventh century. The fact that it could be loaded with arrows prior to the battle rather than during the heat of combat made it especially useful. Small daggers were useful as secondary weapons but were not especially effective. The Knights Templar were well known for their effective use of the lance. The weapon that knights were probably best known for, however, was the sword. (The stereotypical long sword, however, did not appear until almost the end of the Crusade era.)

The swords and knives used by the Muslims had many different types of blades, most of them curved, giving them greater speed in their use. Scimitars, sabers, and tulwars were three typical types of blades used by Muslim defenders, but, like the weapons of the Crusaders, the variety of the Muslims' weapons was nearly infinite.

Large-scale weapons were used to lay siege to cities. Many of them were too large to transport over long distances and thus were often built of local materials very close to the cities they were used to attack. A ballista was a large, arrow-shooting machine that could hurl heavy arrows several hundred yards. Different catapults, such as the mangonel and the trebuchet, hurled rocks at city walls. Siege towers were built and then pushed against city walls, allowing soldiers to climb stairs within the tower's interior, protecting them from city defenders. More crudely built, battering rams were used to break through city gates. In defense, garrisons poured boiling liquids—oil being the most effective, if the most expensive—from the tops of the walls, inflicting immense pain on those trying to scale the walls.

Only wealthy soldiers would have been able to afford any type of armor. Commoners used makeshift shields and other rudimentary methods to protect themselves as best they could. True armor was one way in which knights were identified. Chain mail, one of the earliest forms of armor, was used in conjunction with a shield and a helmet. However, with the development of better weaponry, such as the crossbow, mail armor became increasingly ineffective, and plate armor appeared near the end of the Crusades. Though cumbersome, it could protect the knight against most weapons and made other types of protection, such as shields, unnecessary.

TURNING POINTS

1095-1099	During the First Crusade, initiated by Pope Urban II, European crusaders, fighting to protect the Holy Land for Christianity, capture Jerusalem.
1145-1149	The Second Crusade, unsuccessfully led by the kings of France and Germany, is prompted by Muslim conquest of the principality of Edessa in 1144.
1187-1192	The Third Crusade succeeds, especially through the efforts of English king Richard I, in restoring some Christian possessions.
1198-1204	The Fourth Crusade, initiated by Pope Innocent III, captures Constantinople and damages the Byzantine Empire.
1217-1221	The Fifth Crusade, organized to attack the Islamic power base in Egypt, succeeds in capturing the Egyptian port city of Damietta but ends in defeat when the crusading army attempts to capture Cairo.
1228-1229	In what is sometimes referred to as the Sixth Crusade, the excommunicated Holy Roman Emperor Frederick II sails to the Holy Land and negotiates a reoccupation of Jerusalem.
1248-1254	The Seventh (or Sixth) Crusade is led by Louis IX of France and follows a course similar to that of the Fifth Crusade.
1269-1270	Eighth (or Seventh) Crusade is organized by a now-elderly Louis IX, who dies upon landing in Tunisia, leading to the breakup of his army.
1270-1272	Edward I, the son of Henry III of England, decides to press on alone to Palestine after the French abandon the Eighth Crusade and achieves some modest success with a truce before the ultimate fall of Acre, the last bastion of the Crusader states, in 1291.

MILITARY ORGANIZATION

The reasons for joining a crusading army involved the feudal class system as well as political, economic, and social factors. The feudal system defined every human's station in life. Society resembled a pyramid, with the king sitting at the apex, the nobility below him, and the great masses at the bottom. The king was the absolute ruler of the state, aided by his nobility. His knights of the sword governed without restraint and with the Church's collusion. The rationale for the existence of various classes was to defend the kingdom.

Kings, nobles, and knights controlled the workings of society but had a responsibility to provide soldiers when called upon. Feudal nobility and royalty hired mercenaries if they were unable to draft enough local soldiers, and such soldiers served regardless of faith and background. With increased births and the expansion of the noble classes, more heirs existed than positions available. As a result, many nobles did not acquire estates; the options were that the eldest received the estate (primogeniture), the second male became a warrior, and the third joined the Church. Many of those denied estates had to join the Crusades to make their fortunes. The lower classes served the needs of the nobility, whose duty was to defend them. Peasant classes had few rights and many obligations to their lords. They surrendered much of their produce, cared for animals, and had to endure the humiliation of the "first night," during which the noble could enjoy carnal relations with the newly married woman before her husband did. Such a custom, which could not be resisted, caused despair and offered no hope for the future. This hopeless status provided the impetus for many peasants to take up the Cross and join the Crusades.

Women's positions were even more confining and problematic. At the time of the First Crusade women of noble birth could marry, enter a convent, or walk to Jerusalem, the latter option providing an alternative to the confines of their roles in Europe. The long, arduous trip offered some hope of a less restricted life, but even that option was removed when, in the aftermath of the bloody failure of the First Crusade in 1096, the pope declared that no women, children, or old people would be allowed to go on later Crusades.

With the need for additional well-trained troops, the Knights of Saint John of Jerusalem (known as the Hospitallers)—whose membership comprised men

of noble birth and those who had taken vows of poverty, chastity, and obedience to the Church—were founded in 1080 as a hospital in Jerusalem. After the Crusaders were finally able to take Jerusalem in 1099, they were transformed into a military-religious order, and their experience in the region helped the Crusaders. They maintained medical and hospital facilities for the pilgrims and had military obligations, as the Church charged them with the defense of pilgrims in the Holy Land. They received donations of castles and other significant properties in the Holy Land and in time had to fight in their defense. The Knights of the Temple, or Knights Templar, were another military crusading order. They were chaste, subject to rigid discipline, and imbued with feudalism. They actively participated in the seizure of Jerusalem. After their formation in 1119, they bore the major burden of retaining Jerusalem for Christianity. They protected pilgrims, had small empires, formed the largest army in the east, and maintained castles and fortifications. Although their existence survived the end of the Crusades, they soon fell out of favor both with European royalty and with the pope, because of their great wealth. The pope would eventually, in 1314, abolish the Knights Templar for fear that they were acquiring too much wealth and power. Other orders appeared, but their contributions were smaller than those of the Knights Hospitaller and the Knights Templar. The Brethren of the Sword, the Knights of Calatrava, the Knights of Santiago, the Brethren of Santa Maria, and the Knights of Our Lady of Montjoie all made contributions, but to differing degrees. They demonstrate, however, the universal attraction of joining the Crusades, coming from as far away as Spain. Such orders, with small contingents, generally left the region after collecting their booty.

Despite the tenuous relations between Rome and

Europe and the Byzantine Empire During the Crusades

Constantinople, the Byzantines had shared a common enemy with the European Crusaders: the expansionist forces of Islam. Providing a safe route to Jerusalem led to constant warfare with the Seljuk Turks and others. Specialized units of Byzantine cavalry aided the Crusaders. They captured Antioch in 1137, forcing the Christians to pay homage to the Byzantine emperor. A year later, a combined force of Franks and Byzantines compelled the emir of Shaizar to yield. Shortly afterward, Byzantine forces accompanied the Franks in their struggle against the Saracens. In 1163-1164, the Byzantine navy transported the Franks on their Egyptian venture, but as competition between the Franks and the Byzantines became more obvious, this was the last engagement of a combined force against Islam.

DOCTRINE, STRATEGY, AND TACTICS

The Crusades were intended to purify Christendom against pagans, heretics, and the excommunicated. The driving ideology was that all disagreements between Christian lords should be put aside, and the nobles' efforts directed toward a more important enemy, the Muslims, who had held the Holy Land for more than three hundred years and who were making it difficult for Christians to make pilgrimages to the land where Jesus walked. The problem of the Muslims was not just confined to the Levant, though. At the time, Turks were at the gates of Europe and the Byzantine Empire was only a weakened shadow of its former self. Pope Urban II's call to free Jerusalem of the Muslim infidels provided long-sought opportunities under the guise of religious zeal and sacrifice. Individuals of every social, political, and economic class, many of whom were unprepared for the journey, assembled at various points through Europe and moved toward the Mediterranean Sea. On the way, the Crusaders pillaged for food and murdered in the name of God. Whole Jewish communities were eliminated solely for religious reasons. Rome, viewing Jewish and Muslim believers equally as infidels, made no effort to quell the Crusaders' European slaughter.

The Crusades, and the ideology behind them, flowed from the Papacy. The nobles who participated received indulgences for the forgiveness of sins, temporal privileges, and often immunity from civil jurisdiction. The Papacy itself stood to gain from the Crusades as well. At the time, papal jurisdiction did not extend outside Europe, and the establishment of the Crusader kingdoms certainly expanded the power of the Western, or Roman, Catholic Church into regions that had previously been under Eastern, or Byzantine, jurisdiction. The Knights Templar and the Hospitallers formed the largest portion of the crusading army remaining in the east. Their expressed devotion resulted in large donations and recruits for the Outremer (literally, "overseas"—the name for the Crusader kingdoms of the Middle East). They soon became the largest landholder in the area. Their self-declared responsibilities required them to patrol the vast regions seeking pilgrims in trouble. The quest for power was also a large part of the ideologies that drove many individual Crusaders and a number of the religious orders that were founded during this time. City-states, like the maritime cities in Italy, also saw the potential to gain power through participation in the Crusades. By 1204, papal leadership was for the most part dispensed with, as German and French princes pursued Crusades of their own accord. Still, Crusades went on until the fifteenth century, when the Turks were allowed to take Constantinople and Europe withdrew from the Middle East.

In time, the Crusaders, through the assistance of these orders, learned how to prolong the conflict between themselves and Islam. They allowed the creation of soldier-monks to protect the Christians on their pilgrimage to Jerusalem. Since they were involved in a "just war," the pope did not condemn the actions of his armies. Rather, European conduct became known and when the Franks arrived at Jerusalem, the Muslims and Jews united to fight for the city, which fell on July 15, 1099.

After capturing the city from the Muslims, the Jewish and Muslim populations were massacred. The Crusaders then established four major kingdoms, the Kingdom of Jerusalem with Godfrey of Bouillon proclaiming himself as king, County of Edessa, Principality of Antioch, and County of Tripoli. Throughout the region the Crusaders established other fiefdoms, in none of which were non-

Christians well treated. These events strengthened the opposition to the Crusades and provided Islamic fervor to fight. In 1009, Fāṭimid caliph al-Ḥākim destroyed the Church of the Holy Sepulchre, and by 1039 it was rebuilt mainly because the Muslims realized the profit of having Christian pilgrims in the region. Whether Turks, Mamlūks, ʿAbbāsids, Moors, Seljuks, Fāṭimids, Ayyūbids, or Syrians, they did not forget the Crusaders' conduct. Their professional armies were larger and better trained, had better archers, had more sophisticated strategies, were more adaptable to the climate and food, had public support, and had time on their side. While the European nobility eventually tired in their ventures, Muslims retained the vigor of fighting the "infidel" in their own land.

Eventually a Kurd, Saladin, became the commander of Islamic forces after the fall of the Fāṭimids, and he established a new dynasty, the Ayyūbids. He had military talent and was appointed commander of all Muslim forces. He united the Muslims in Egypt and, in 1187, recaptured Jerusalem in the Battle of Hattin. Under Muslim rule, Jewish and Christian populations were respected. After Saladin, the Crusaders lost their initiative and did not mount another credible campaign against the Muslims. By the thirteenth century, the few remaining principalities in Crusader control had fallen to the Egyptian Mamlūks. With the fall of Constantinople to the Ottoman Turks in 1453, Christendom gave up its religious and political influence in the region.

Medieval Sources

As interest in the Crusades has been nearly constant over the centuries, there is no dearth of published sources written by the Crusaders themselves. Mostly written by those of nobility, among the most accessible are those of William, archbishop of Tyre (c. 1130-c. 1190), who wrote *Historia rerum in partibus transmarinis gestarum* (*History of Deeds Done Beyond the Sea*, New York: Da Capo Press, 1973). Philippe de Mezières (c. 1327-1405) wrote *Le Songe du vieil Pelerin* (the dream of old Pelerin; London: Cambridge University Press, 1969). John M. Sharp edited and Frances Hernandez translated *The Catalan Chronicle of Francisco de Moncada* (El Paso: Texas Western University Press, 1975). The nine thousand lines of verse that constitute *The Chronicle of Morea* tell the tale of Frankish Crusaders during the Fourth Crusade. Edited collections include Elizabeth Hallam's *Chronicles of the Crusades: Eye-Witness Accounts of the Wars Between Christianity and Islam* (London: Weidenfeld and Nicolson, 1989) and D. C. Munro's 1902 *Letters of the Crusaders*. Primary sources looking at the Crusades from the Muslim side include Ibn Kalanisi's *The Damascus Chronicle of the Crusades* and Amin Maalouf's *The Crusades Through Arab Eyes* (London: Al Saqi Books, 1984).

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Arthur K. Steinberg and Steven L. Danver

THE MEDIEVAL WORLD

THE MIDDLE EAST AND AFRICA

Armies of Muḥammad and the Caliphate

Dates: 622-1060 C.E.

Political Considerations

The armies inspired by Islam unified the fractious Arabian Peninsula in the Riddah Wars (Wars of Apostasy) during the eight years before Muḥammad's death in 632 and the subsequent rule of his father-in-law, Abū Bakr, the first *khalīfat rasul al-Lah* (successor to the messenger of God, often rendered as "caliph"). From 636 to 714, relatively small but disciplined armies conquered a large portion of the Byzantine Empire and the entire Sāsānian Persian Empire, both exhausted by twenty-seven years of continuous mutual warfare. The Arabic language, which previously had no written grammar, became the language of religion, scholarship, law, and commerce over wide areas of western and southern Asia and northern Africa. Islam, a revealed faith centered in the isolated cities of Mecca and Medina (the latter formerly called Yathrib), became one of the world's largest religions.

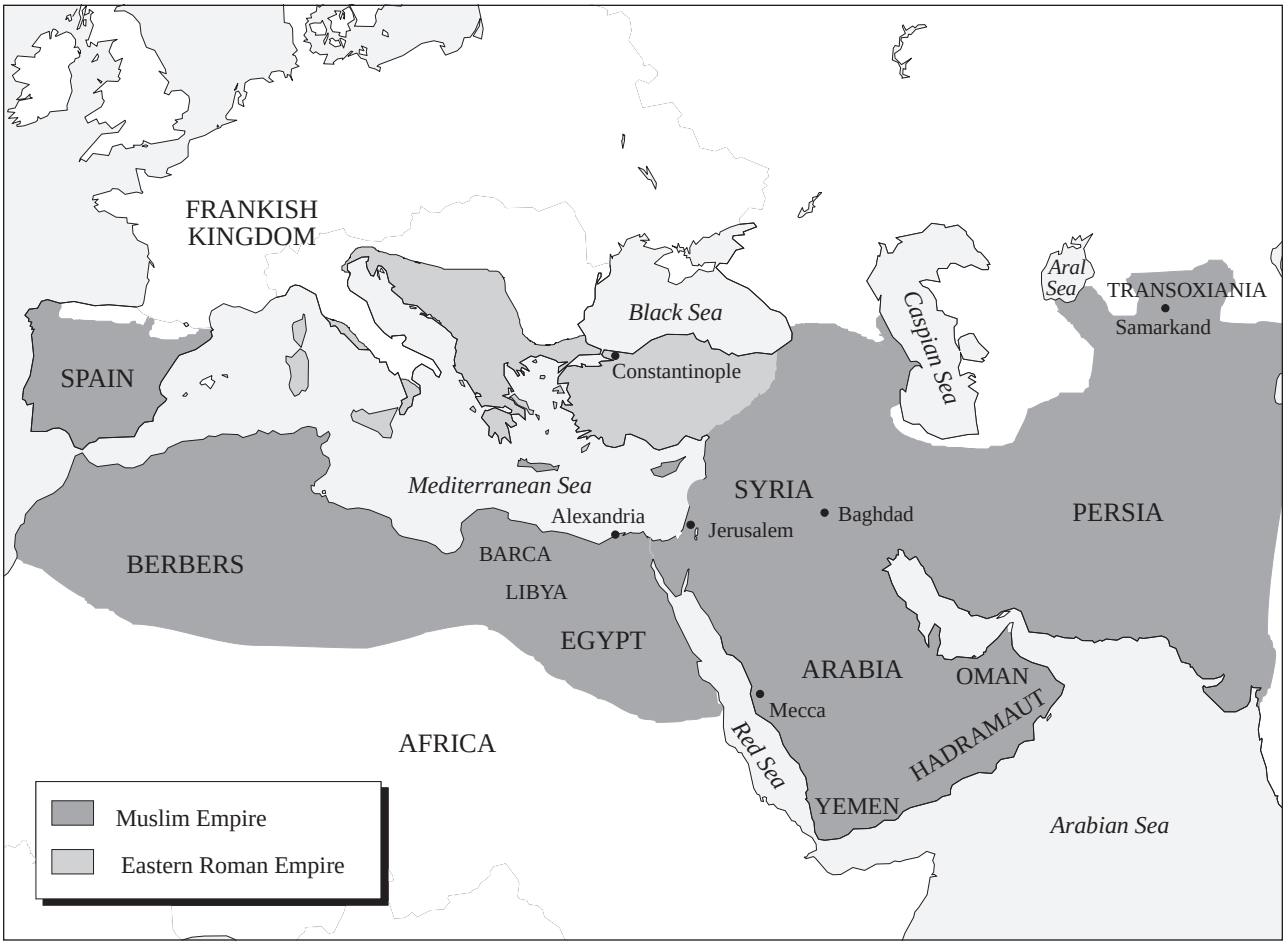
Three distinct caliphates ruled a more or less united, and expanding, Dar-al-Islam (literally "home" or "abode," a division of the Islamic world) from 632 until about 909. Abū Bakr, the consensus choice to lead the fledgling Muslim community, oversaw collection of notes from Muḥammad's revelations, which would become the Holy Qurʾān, and organized the command structure of a disciplined army. Three more *rashidun* (rightly guided) caliphs, from Muḥammad's inner circle, were chosen by consensus of the *shūrā*, elders of the Muslim community. The second caliph, ʿUmar ibn al-Khaṭṭāb, adopted the title *amīr al-muʾminin*, commander of the faithful. The two titles were used interchangeably, but over time, "caliph" was commonly the title of the highest ruler, while "emir" (or "amir") was sometimes a subordinate office. ʿUthmān ibn ʿAffān followed ʿUmar, who was followed in 656 by Muḥammad's cousin and son-in-law, Alī ibn Abī Talīb.

ʿAlī's caliphate was challenged by Muʾāwiyah ibn ʿAbī Sufynā, a son of Mecca's Banū Umayya clan, wealthiest of the Quraysh (Arabic *Quraš*). Muḥammad's Banū Hāshim clan were Quraysh, although lower on the social scale. Years of *fitna*, wars between Muslims, ended in 661, when Muʾāwiyah established the caliphate's first hereditary dynasty, with its capital in Damascus. Adherents of ʿAlī, who had been pushed into what is now central and southern Iraq, became the nucleus of the Shia branch of Islam. ʿAbbāsid caliphs (claiming descent from Muḥammad's uncle, al-ʿAbbās) took power in 750 after another fitna, nearly exterminating the Umayyads, and established a new capital, which became Baghdad. One Umayyad prince, ʿAbd al-Raḥmān ibn Muʾāwiyah ibn Hishām, established himself in 756 as emir in fractious al-Andalus (southern Spain), where his descendants would claim the title of caliph in 929.

Little effort was made to convert the inhabitants of conquered territory. Arabs, like Jews, considered themselves the chosen people of God's revelation. In the second sura (chapter), the Qurʾān enjoins believers to fight against unbelievers "until idolatry is no more and al-Lah's religion reigns supreme" but also asserts, "There shall be no compulsion in religion." The first caliphs had little experience and less interest in the details of administration, which was left to clerks, judges, and administrators among the conquered peoples. Umayyad caliphs made sharp distinctions between Arabs, *mawali* (non-Arab converts to Islam), and *dhimmi* (non-Muslim subjects). The finances of the Umayyad caliphate depended heavily on the *jizya*, a tax paid by nonbelievers.

Social and political distinctions between different Arab identities persisted for centuries in military ri-

MUSLIM EMPIRE IN 760



valry in newly acquired territories on three continents. Yemenis and southern Arabs competed with northern Arabs, while Arabs long settled in Syria (al-Shamiyyun) were resented by those remaining in the Hijaz of the Arabian Peninsula. Berbers in western North Africa, once converted to Islam, became rival claimants to power. One result of rapid conquest is that Arabia itself lapsed into tribal disunity as an isolated backwater of the growing empire. As early as 813, Iranians and Turks from beyond the Amu Dar'ya (Oxus River) dominated the armies of the ʿAbbāsid caliphs.

The Dar-al-Islam ceased to be a single caliphate, even formally, by 909. The Fāṭimid Dynasty of Ifriqiya (modern Tunisia) formally established the first Shia caliphate, eventually extending from Tunisia to Egypt and Palestine. The Umayyad caliphate of Córdoba, established in 929, broke up into competing *taifa* states after 1031. By the 1080's, successive Berber religious revivals known as *al-Murabitun* (Almoravids) and fifty years later *al-Muwaḥḥidūn* (Almohads) built their own empires in the Maghreb of North Africa and al-Andalus. In Baghdad, Seljuk Turks intervened between 1055 and 1060 on behalf of the weakened ʿAbbāsid caliphs, against the efforts of Buyid princes to establish Shia rule and ally with the Fāṭimids. In 1058, the authority of the caliph was delegated to the Turkish general Tughril (or Toğrül) under the title of sultan. By the early 1100's, political disintegration into a series of autonomous feudal es-

tates left the sultanate vulnerable to the invading Frankish Crusades.

Military Achievement

Muḥammad's first accomplishment was to survive military confrontation with the future generals of Islamic conquest, his Meccan adversaries of the Quraysh clan. These battles began as traditional *razzia*, or raids against caravans. A successful ambush by a few hundred Muslims in March of 624 at Badr was followed in March, 625, by Meccan revenge in a battle at Uhud. In March, 627, an army of ten thousand Quraysh marched on Medina and was repulsed at the Battle of the Trench. A combination of tribal diplomacy, domination of trade routes, growing wealth, and the allegiance of Bedouin warriors allowed Muḥammad to secure the capitulation of Mecca in January, 630, without battle.

Significant conquests outside the Arabian Peninsula began in 636, four years after the Prophet's death, under the second caliph, ʿUmar I. After defeating a Roman and Armenian force of thirty thousand at the Battle of Jabiya-Yarmūk on August 20, 636, the armies of Islam dominated Syria and Palestine. Jerusalem was surrendered after a seven-month siege in 638. Generous terms, allowing non-Muslims to pay the jizya (a tax on non-Muslims) and practic their own religion and laws, left little motive to die fighting Islam. Alexandria, with impregnable walls and a garrison of as many as fifty thousand Roman soldiers, was surrendered by its patriarch in 641, following a five-month siege, to Muslim commander ʿAmr ibn al-ʿĀs. The Eastern Roman Empire lost close to 80 percent of its territory in five years.

In 637, the Iranian capital of Ctesiphon fell after a battle with thirty thousand Sāsānian soldiers near al-Qādisiyya, on the west bank of the Euphrates River, near the present location of Baghdad. The Sāsānian Empire ended after the Battle of Nihawand in 642. Muslim influence reached and passed the Oxus River (Amu Dar'ya) into central Asia.

The first Umayyad caliph made a determined effort in 672-679 to take Constantinople, sending a fleet of as many as one thousand ships into the Sea of Marmara, after seizing a number of Aegean islands. Extensive use of the incendiary weapon "Greek fire" to destroy the caliph's ships, together with the walls built by Emperor Theodosius II, defeated the siege. The Theodosian walls were 5 yards thick, rose 12 yards high, and were constructed of brick and granite. In 717, Caliph Süleyman (or Sulaymān) ibn ʿAbd al-Malik tried again, with an army of eighty thousand, including the elite *ahl al-Sham* of Syria; Khorāsāni from northern Iran; cavalry from Persia, Iraq, Arabia, and Egypt; and infantry from as far away as the Oxus River and Ifriqiya. In addition to a fleet in the Sea of Marmara, Süleyman's brother Maslama brought an army to the plains west of Constantinople, against the walls built by Anastasius I.

Turning Points

622	In a journey known as the Hegira, the Islamic prophet Muḥammad (c. 570-632) flees from Mecca to Medina to avoid persecution.
632-661	Muḥammad is succeeded after his death in 632 by the four legitimate successors of the Rāshidūn caliphate.
680	The forces of Muḥammad's grandson Ḥusayn are ambushed and massacred at the Battle of Karbalā, marking the beginning of Shia as a branch of Islam.
mid-8th cent.	Islam becomes the dominant religio-political power structure of the Middle East, from the Atlantic to the Indian frontier, including the Mediterranean coast and Spain.
1095	The Crusades are launched by Christian warriors seeking to reclaim the Holy Land for Christianity.
1187	Jerusalem is captured by Saladin from the Crusaders.
1260	Baybars I, the Mamlūk sultan of Egypt, defeats the Mongol hordes at Nabūlus.
1453	Muslim Turks besiege and capture Constantinople, extinguishing the Byzantine Empire.

The siege ended after eleven months, the caliphal army decimated by cold weather, shortage of food, disease, and a surprise attack by Bulgarians.

Muʾawiya sent an army commanded by ʿUqbah ibn Nāfiʿ into the Maghreb of western North Africa in 670. After initial success, ʿUqbah died in 682 in Ifriqiya fighting a Berber chieftain named Kusayla, supported by remaining Greco-Roman soldiers and a substantial Jewish population. The Muslim fortification of Qayrawan (Kairouan or Kirwan) fell in 684; for the next twenty years, forty thousand troops under Hasān ibn an-Nuʾmān al-Ghassānī fought to retake the Maghreb. A Jewish woman known as Kahina of the Aurès led resistance after the death of Kusayla. Emir Hasān's soldiers captured Carthage in 690, but resistance was not fully ended until 704. A new vizier of Barqa and Ifriqiya, Mūsa ibn Nuṣayr, had employed diplomacy and Muslim ʿ*ulama* to secure Berber allegiance. By then, the caliphate had been through another fitna. After the death of Muʾawiya's son Yazīd and his son Muʾawiya II, another branch of the Umayya, the Marwanids, fought Arabs from the Hijaz region (including Mecca and Medina) in 684, ending with the Umayyad caliphate still ruling.

A convert from one of the Berber tribes, Tāriq ibn Ziyād, was given command in 708 of Tangier, and in 711 he launched the invasion of the Iberian Peninsula, where a Visigothic aristocracy ruled a disarmed population of Iberians, Romans, and Jews. A single battle in July near the Guadalete River and the town of Sidonia (Shaduna) eliminated King Roderick and a good part of the Visigothic nobility; Tāriq lost at least three thousand men. Eight hundred men under Mughith al-Rumi, apparently a Roman convert, took the undermanned fortifications of Córdoba, while Tāriq found Toledo nearly deserted. Tāriq was joined in 712 by Mūsa ibn Nuṣayr, with an additional eighteen thousand Yemeni soldiers. Sevilla resisted for three months in late 712; Merida was defended for more than five months in 713, including a charge by Visigothic cavalry and infantry, which badly damaged the besieging forces. At the end of 714, the entire land south of the Pyrenees, called al-Andalus by the new conquerors, was nominally subject to the caliph in Damascus. However, independent *wālis* resisted rule from emirs in Córdoba, even indulging in alliance with Aquitainian Christians. An incursion by Emir ʿAbd Allah al-Ghafiqi (ʿAbd al-Raḥmān) into Aquitaine was repulsed by Charles Martel, the Frankish king, at Tours in 732. A Berber revolt in 739 preoccupied caliphal armies in Spain and Africa for many years. By 795, Charlemagne's Spanish March had fostered small Christian kingdoms in the northern part of what became modern Spain, benefiting from alliance with wālis dissatisfied with the new Umayyad emirate established in 756.

WEAPONS, UNIFORMS, AND ARMOR

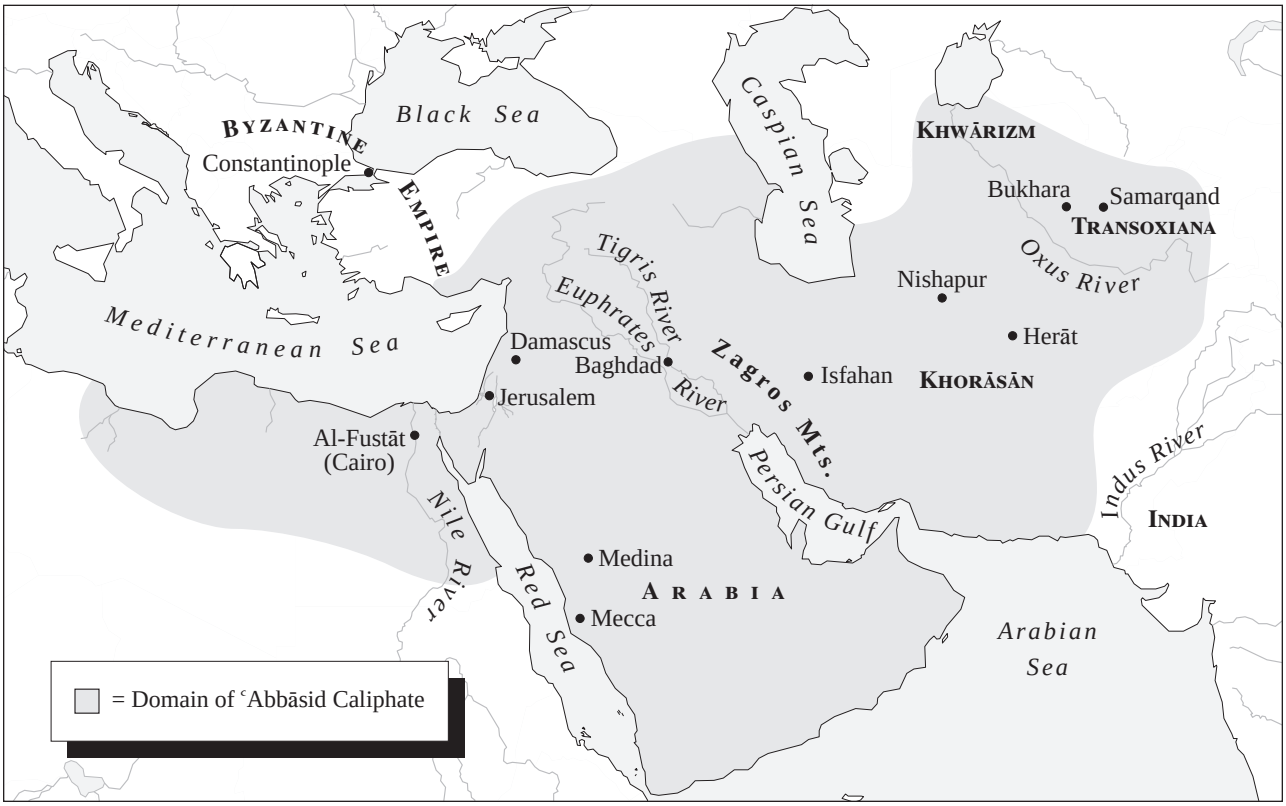
The armies that emerged from the Arabian Peninsula fought mainly with sword and spear, often wearing felt armor and carrying shields of various leathers. Helmets were rare, although chain mail and iron helmets were not unknown. Armored infantry were generally placed in the front ranks to protect those with lighter or no armor. Javelins were sometimes used prior to physical contact. At the Battle of al-Qādisiyya in 637, a Muslim army fought thirty thousand Sāsānians with darts, arrows, spears, swords, and battle-axes.

Bedouin lances—one 5 cubits in length, another 11 cubits—were the main cavalry weapon. (A cubit was defined as the length of a man's forearm.) Horse-mounted cavalry were equipped with shields, hauberks, and helmets and were armed with swords on baldrics; horsemen also carried a packing needle, five small needles, linen thread, an awl, scissors, and a horses's nose-bag and feed basket. Leather loop stirrups were known but despised as a sign of weakness and therefore seldom used. When Muslim conquest reached Khorāsān at the close of the seventh century, iron stirrups were adopted, spreading back across Mesopotamia and Africa.

Under the Umayyad caliphs, cavalry were supplied with lances, maces, swords, and the khanjar daggers. Berber cavalry, who fought first against the Muslims, then became fierce soldiers of Islam, were wearing the *imama* (a turban over a metal cap) and coats of light mail under leather.

Iranian (Persian) and Turkish armies from central Asia, which came to dominate the later years of the

THE ʿABBĀSID CALIPHATE, C. 800



caliphate, were predominantly cavalry, featuring armored archers shooting from horseback. Horses were protected by bards of felt, and riders were equipped with lamellar cuirasses, hauberks, arm covers, lances, and leather shields of Tibetan origin. Maces, battle-axes, and single-edged short swords were also used, and full-size swords were slightly curved.

MILITARY ORGANIZATION

Muḥammad and Abū Bakr organized the Muslim armies into disciplined formations, contrary to previous Arab custom. Troops were drawn up in lines of battle with a center (*qalb*, literally heart), right wing (*maymana*), and left wing (*maysara*). Many fought in tribal units, with their own banners. As in Byzantine armies, archers were deployed primarily to protect infantry flanks from enemy cavalry attacks.

Distinctions between infantry and cavalry were blurred, since infantry was transported on horses and camels, while cavalry often dismounted, fighting on foot. Warhorses were rare and carefully conserved, led to battle, and mounted only when fighting began. Horses were a high priority for tribute from newly acquired territory. While camels were not used in battle, they allowed the infantry greater maneuverability in choosing the time and place to give battle.

For the first few decades, successive caliphs kept their armies apart from the conquered population, building garrison towns such as al-Kufa, Basra, Qayrawan, and al-Fustat. Jabiya, the principal military camp of the Bilad al-Sham, was larger than the city of Damascus, which it secured. Muslim soldiers were enrolled in a roster called the *diwan*, with a salary according to a fixed pay scale, initiated by the second rashidun caliph, ʿUmar. Under the caliphate of Muʾawiya (661-680) the diwan reached forty thou-

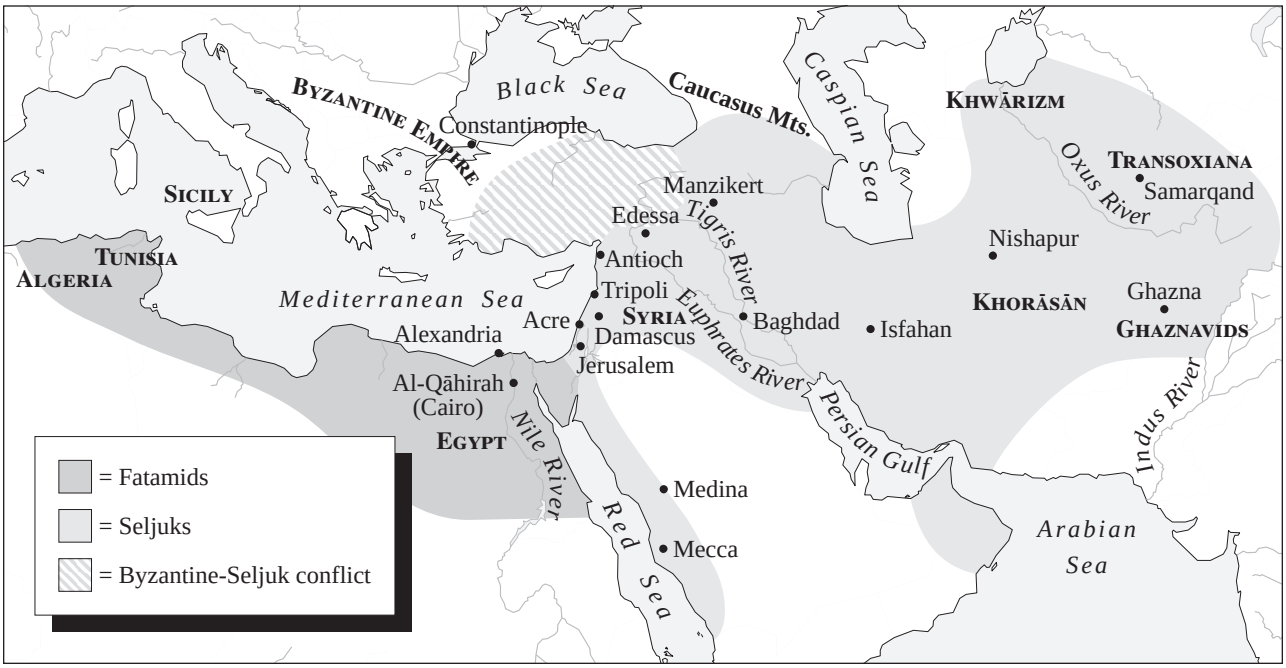
sand names but was thereafter closed, enrollment becoming a privilege rather than a routine record of enlistment.

Regional armies were organized or designated in territories that became part of the Dar-al-Islam, both the region and the army known as a *jund*. The soldiers were Arab settlers, supported by tax revenue from their area. Junds were assigned for Damascus, Jordan (with the capital at Tiberias), Palestine (capital at Jerusalem), Ascalon, and Homs. Later junds were designated for Qunnasrin (including Antioch, Manbij, and Aleppo). The original jund established in Egypt included south Arabian or Yemeni tribes, principally the Azd, Himyar, Kinda, and Lakhm. Junds were also designated in al-Andalus. The original leadership were *ahl al-Raya*, or "people of the standard," drawn from the Quraysh and the *ansar*, companions of the Prophet. Parcels of land known as *khittas* were allotted to each tribal group. Soldiers in the jund were enrolled in the diwan, and received monthly pay called *ata*. Inevitably, the junds became power centers on which caliphs, rebels, or challengers relied to uphold the current ruler or overturn him, to sustain the unity of the Dar-al-Islam, or to secede from caliphal authority. In the late ninth century, junds were largely replaced by the Turkish *ghulams*.

DOCTRINE, STRATEGY, AND TACTICS

Speed and maneuverability accounted for many of the early Arab victories over larger, better armored and well-established armies, trained to hold fixed positions or move en masse. Offensive moves called *karr wa farr*, repeated attack and retreat, were employed not only against Byzantine and Sāsānian forces but also against Visigothic Hispania, which became Muslim al-Andalus. At the Battle of Jabiya-Yarmūk in 636, a feigned retreat on the third day of fighting by Āmir ibn ʿAbdullāh ibn al-Jarrāh's troops drew Armenian general Vahan's infantry in pursuit, opening space for Khālid ibn al-Walīd's soldiers to drive a wedge between Byzantine infantry and cavalry, ending the battle in a rout. The armored cavalry of Tāriq ibn Ziyād similarly opened a wedge in the Visigothic line near the Guadalete River in July, 711. Repeated

THE FĀṬIMIDS, C. 1040



charges failed to dent the Sāsānian cataphracts at al-Qādisiyya in 637, and Iranian war elephants panicked Arab cavalry horses. After experienced elephant fighters arrived on the third day, sending the elephants crashing back into the Sāsānian line, Persian discipline broke down. With limited room to maneuver, the defenders were driven into the Euphrates River.

MEDIEVAL SOURCES

Prior to the emergence of Islam from the Arabian Peninsula, there was little tradition of either scholarship or written literature in the Arabic language. Perhaps the most comprehensive Muslim scholarship roughly contemporary to the history of Muḥammad and the Caliphate is Abū Jaʿfar Muḥammad ibn Jarīr al-Ṭabarī's *Taʾrīkh al-rusul wa al-mulūk* (872-973; *The History of al-Ṭabarī*, 1985-1999, 39 volumes). Individual volumes include *Muḥammad at Mecca* (volume 6) and *The Conquest of Iraq, Southwestern Persia, and Egypt* (volume 13). Al-Ṭabarī was already well known for an exhaustive multivolume commentary on the Holy Qurʾān, completed about 903 C.E. A later reference is Ibn Khaldūn's *Muqaddimah* (1375-1379; *The Muqaddimah*, 1958; also translated as *An Introduction to History*, 1967). While much of the material is secondary, it offers the most detailed primary material on the history of the Mahgreb.

Offering a rare glimpse from the nearly illiterate lands north of the Pyrenees is the *Annales regni Francorum* (741-829; *Royal Frankish Annals* in *Carolingian Chronicles*, 1970), which includes reference to the Spanish March. While most Byzantine manuscripts from this period have not been preserved, Theophanes' *Chronographia* (815; *The Chronicle of Theophanes*, 1982) draws on many lost sources, and it along with Nikephoros's *Breviarium historicum* (787; *Short History*, 1990) are both available in English translation.

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Charles Rosenberg

Armies of the Seljuk Turks

Dates: c. 900-1307 C.E.

Political Considerations

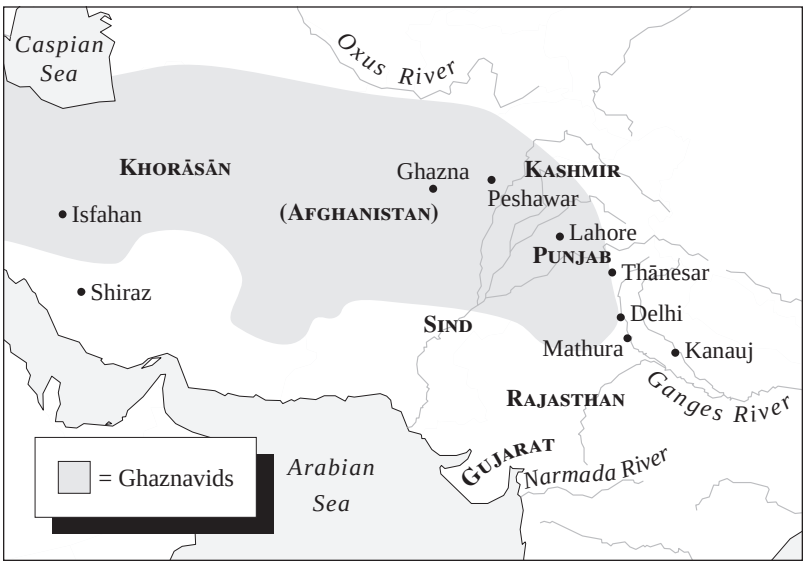
In 750 the ʿAbbāsid Dynasty had succeeded the Umayyad Dynasty as rulers of the Muslim world. However, by 1050 ʿAbbāsid authority was greatly reduced; this decline further splintered the followers of Islam. Into this leadership void stepped the Seljuk Turks, and for nearly a century and a half they were the dominant Muslim dynasty ruling abroad in Armenia, Persia, Iraq, and Syria.

Close to a century earlier, a tribal leader named Seljuq (also known as Selchuk or Seljuk) had moved and settled this nomadic band from the region north of the Aral Sea into Central Asia. Around 1040 this tribe, which had been previously identified as part of the larger group of Oghuz Turks, became known as the Seljuqs or Seljuks. Two brothers, Toghrïl Beg and Chaghrï Beg, grandsons of the Seljuq namesake, successfully united various tribes into a Seljuk army, which they led to victory over the Ghaznavid Dynasty (which spanned eastern Iran, central Afghanistan, and modern-day Pakistan) at the Battle of Dandanqan. This decisive victory signaled the end of the Ghaznavid Dynasty and heralded the rise of the Seljuk Turks.

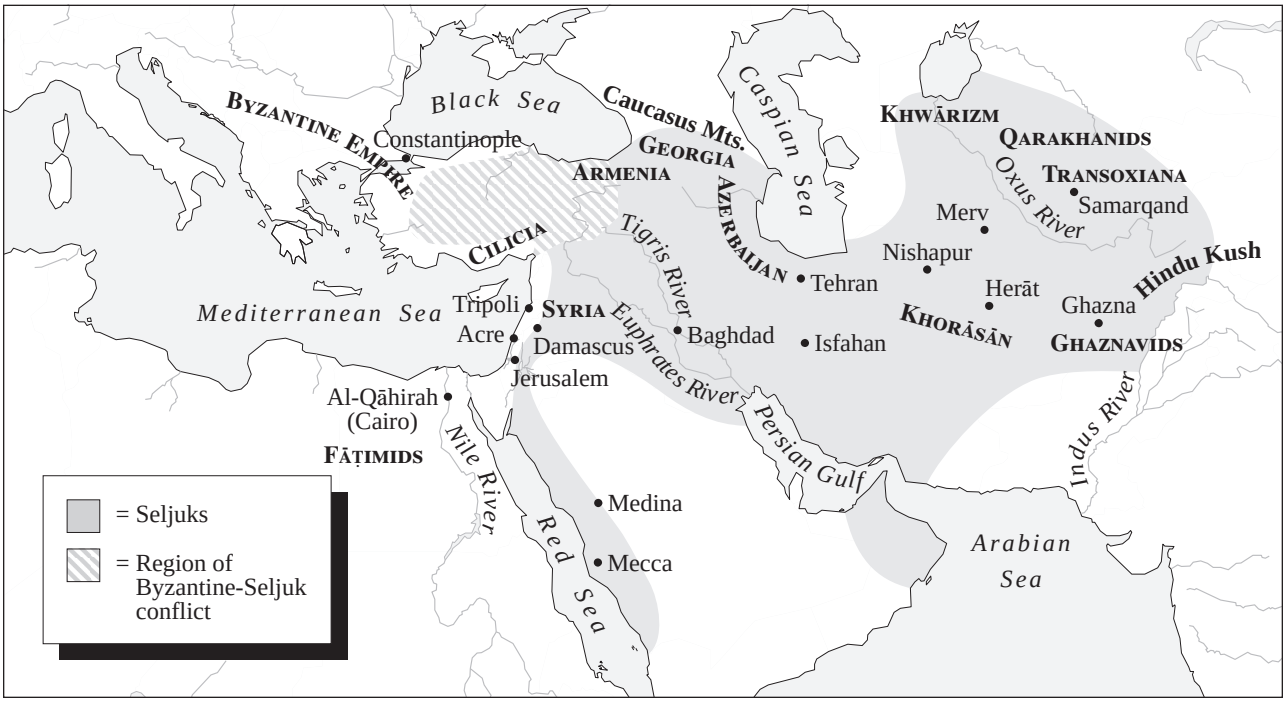
In 1055 the Seljuk Turks seized Baghdad in a bloodless coup. An ʿAbbāsid caliph was left to rule as titular ruler, but the Seljuks were the true political force for the next three generations. In 1067 they were raiding lands claimed by their Christian rivals, the Byzantine Empire. Toghrïl Beg's nephew, Alp Arslan, led the Seljuks to a decisive victory at the Battle of Manzikert in 1071. This one-sided win opened the way for mass Turkish migration into Anatolia. In this same year, Seljuk forces occupied the holy city of Jerusalem.

Alp Arslan was killed the following year in a bizarre duel with an enemy commander, often called an assassination. His son Malik Shāh I, along with the grand vizier Niẓām al-Mulk, brought a short-lived period of stability, organization, and cultural flourishing to what had come to be called the Empire of the Great Seljuks. In theory the "Great Seljuks" were to be masters of all the Seljuk sultan lines, but this was seldom the case. Sultanates operated in territories in Persia and Syria, and a fiercely independent Seljuk state was founded by Süleyman after his capture of the Byzantine city of Nicaea in 1078. This became the sultanate of Rum—the Arabic word for Rome was Rum, and this was a fitting designation as the region had once been in Roman/Byzantine possession.

The Ghaznavid Empire, c. 1030



SELJUK TURKS, C. 1090



Religious differences between sects brewed dissent among the nations of Islam. These theological disputes sparked the creation of the Assassins, a militant Islamic sect that was responsible for the death of Niẓām al-Mulk in 1092.

Political infighting also hastened the dissolution of the empire. It was common practice to carve up a deceased ruler's property and dole out separate kingdoms to the surviving sons in grants called *iqtāʿ*. This ever-increasing collection of disparate emirs and lesser sultans continuously undermined Seljuk central authority. The weakness in this system was especially apparent upon Malik Shāh's death in 1092, when his brother and four sons began to squabble over the inheritance.

In 1095 the First Crusade began, and several key Seljuk cities, including Nicaea and Jerusalem, were lost in 1099. Throughout the rest of the Crusades, divisions between the kingdoms led to some Seljuks supporting the Crusaders. By 1200, Seljuk influence had been checked in all but the Anatolia region. The loss at the Battle of Köse Dag in 1243 to the Mongols reduced the surviving Seljuk kingdoms to a tributary state of the Mongol Dynasty. Finally, in 1307 Sultan Ghiyath ad-Din Mesud II (Masʿūd II) and his son were killed, ending the once-powerful dynasty. The remnants would be absorbed into the Ottoman Empire, which would endure until the end of World War I.

MILITARY ACHIEVEMENT

At the Battle of Dandanqan in 1040 the Seljuks triumphed over the Ghaznavid Dynasty. This gained them a wide swath of land in Iran and central Asia that laid the foundation for their future empire. In 1050, without a battle, the Seljuks gained the important political and military post of Baghdad. Although they were technically subservient to the ʿAbbāsid Dynasty, they were the power behind the scenes. Five years later, at the Battle of Pasinler, the Seljuks won their first significant victory over the Byzantines and their Georgian allies. In the aftermath the Byzan-

tine emperor, Constantine IX Monomachus, was forced to treat with the Seljuk as victors. In 1067 the Seljuk general Kilic Aslan II sacked the Byzantine city of Caesarea (also known as Kaisaria), turning it into the capital of a smaller emirate. This further increased the Seljuk holdings and was another chink in the armor of the Byzantine Empire.

The most significant military achievement for the Seljuk Turks was victory over the Byzantium army just over two decades later, in 1071, at Manzikert. The Byzantines lost the bulk of their professional army in this engagement, and their emperor, Romanus IV Diogenes, was captured and ransomed. This effectively ceded Asia Minor to the invading Turkish bands, who may not have been obedient to the Seljuks but further weakened the Byzantine Empire nonetheless. The ability of the Byzantines to mount future campaigns was greatly crippled, as ceding so vast a territory cost the empire dearly in levies of manpower and other resources. The date of the battle, August 19, 1071, was forever after known by the Byzantines as "the dreadful day." In 1176, at the Battle of Myriocephalon, the Byzantine emperor Manuel I Comnenus suffered another severe setback at the hands of the Seljuks while trying to recover lost territory in Anatolia. This further reinforced the notion of the Turks' supremacy on the battlefield against their Byzantine rivals.

WEAPONS, UNIFORMS, AND ARMOR

The Seljuk Turk fighters could accurately be called steppe light cavalry. The main component of any Seljuk force was mounted archers. Horses were such an important aspect of the Seljuks' battlefield philosophy that on extended campaigns each rider brought at least one spare horse to have in reserve. The territorial reserves, the "irregulars," were also generally mounted.

These riders bore composite bows of horn or bone fed by quivers containing thirty to fifty arrows. While the bow was certainly the preferred weapon, missile weapons such as javelins were also used. Bows were scarce among the irregulars; swords and spears were the weapons used most frequently by those in this fighting element. The Seljuks' primary stopping power was in the bow, but, like any mounted troops, they were prepared to engage in hand-to-hand combat. Swords and maces served as secondary weapons.

In order to maintain a mobility advantage, the Seljuk Turks were unarmored or at best lightly armored. Usually a horse archer carried only a small, rounded shield, usually brightly colored. Some mounted and foot troops were known to wear captured mail, but generally some form of lamellar armor was employed.

The Seljuks appear to have employed no signature uniforms. The chieftains reportedly wore wide-skirted topcoats, cut diagonally with a flap called a *muqaylab*. Normal tribal clothing, frequently dyed in a bright shade, was worn by other Seljuk forces. Belts, made of leather or overlapping plates, were a key component of these warriors' battle clothing, used for keeping close at hand such equipment as replacement strings and bows and secondary weapons. In the Seljuk culture, belts were common gifts to mark favor.

MILITARY ORGANIZATION

The Seljuks relied mainly on the military organization of their predecessors, with a few notable differences. Under their rule a more feudal system was established, each province raising and absorbing the cost of a contingent. A ruler (usually someone with a hereditary claim), called the *amīr al-muʾminīn* (the English word "emir" is derived from this title), was given the revenue for a particular province. A portion of this revenue was expected to be gifted back to the local sultan as a tribute. In times of war the emir was to bring to the fold a certain number of fighters. Some of these would be *askars*, the forces of regular professional soldiers who served as the bodyguards of the emirs; the men who made up the askars were referred to as *askaris*. The sizes of askars varied by province or district; an account from the First Crusade lists two thousand askaris hailing from one particular wealthy region.

Mercenaries supplemented these corps of regulars. For manpower, the emirs turned to the varied Turkmen tribes, which were headed up by their own leaders, called *beys*. These mercenaries were the bulk of the Seljuk military; when rallied and merged with the regulars, these combined armies could be more than 100,000 strong.

DOCTRINE, STRATEGY, AND TACTICS

At the heart of the Seljuk military manifesto was the bow. One outside observer remarked, "The Turks, indeed, who themselves continually seek to develop their skills with bows and arrow, pressed without ceasing." Hunting and intertribal warfare provided ample opportunity for the Seljuks to hone their skills in the use of this vital weapon from a very young age. These large composite missile weapons, when partnered with men on swift horses, gave the Seljuks a decided advantage against the slower, more heavily armored Byzantine and Crusader foes.

The Seljuk Turks were expert light cavalry and, until the emergence of the Mongols, the supreme horseback archers. A typical Seljuk encounter would involve a spirited charge like the one described in this contemporary account: "The Turks began, all at once, to howl and gabble and shout, saying with loud voices in their own language some devilish word which I do not understand . . . screaming like demons." After unnerving the enemy with such a disconcerting outburst, they would attempt an envelopment while keeping far enough away not to engage in hand-to-hand fighting. Again, a contemporary account captures this particular stratagem and its potential devastation:

> It was like an earthquake with howling, sweat, a swift rush of fear, clouds of dust and not least hordes of Turks riding all around us. Depending on his speed, resolution and strength, each man sought safety in flight. The enemy chased them, killing some, capturing some and trampling others under the horses' hooves. It was a terribly sad sight, beyond any lamenting or mourning.

If their opponents held together, the Seljuks would continue to pepper them with arrows from distances that astonished their enemies. One stated, "After we had set ourselves in order the Turks came upon us as from all sides, skirmishing, throwing darts and javelins and shooting arrows from an astonishing range." When the Seljuk archers were pressed, or when they were attempting to execute a more complex plan, they would break and feign retreat. If their unwary foes tried to pursue, they would find it just as dangerous as standing their ground, as the Seljuks would turn and, from their mounts, fire a hail of arrows.

While the bow was the cornerstone of their offensive, the Seljuks recognized the need to close for melee, as this contemporary account shows:

> [The Turks] surrounded our men and shot such a great number of arrows and quarrels that rain or hail never darkened the sky so much and many of our men and horses were injured. When the first bands of Turks had emptied their quivers and shot all their arrows, they withdrew, but a second band immediately came from behind where there were but more Turks. These fired even more thickly than the others had done. . . . The Turk, seeing that our men and horses were severely wounded and in great difficulties, hung their bows instantly on their left arms under their armpits and immediately fell upon them in a very cruel fashion with maces and swords.

MEDIEVAL SOURCES

The *Itinerarium peregrinorum et gesta regis Ricardi* contains an invaluable primary account of the Third Crusade (1187-1192) and provides a very good descriptive account of the Crusaders' clash with the Seljuks in 1191. William of Tyre, an archbishop and chronicler of the Crusades and the Middle Ages, left behind several works of interest to those studying this period and looking for a firsthand account of Seljuk Turk warfare. His account of the Crusades is bundled into the *Recueil des historiens des Croisades,* a large collection of period documents.

Matthew of Edessa, another period chronicler, provides information on the Battle of Harran (1104) as well as on the political climate of the day. The eleventh century *History* produced by Armenian historian Aristakes Lastivertsi contains a wealth of information about the events of that time, including the Seljuk invasions and the Battle of Manzikert in 1071.

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Michael Coker

The Ottoman Armies

Dates: 1299-1453 C.E.

Political Considerations

Anatolia was a politically diverse crossroads in the thirteenth century. The Ilkhans, the descendants of the Mongols, lost their grip on power in Iran; the Byzantine Empire was besieged by the Franks from the west and the Turks from the east. A serious power vacuum developed in the region. A wide array of smaller states formed in this period. Close to a dozen Turkish emirates emerged throughout Anatolia, the Italian trading republics of Venice and Genoa established a presence along the coasts, and various other groups attempted to control what was left.

Out of this situation one group emerged to dominate the rest. The founder of this new state was Osman. He carved out an independent center of power near the Byzantine Empire and after years of raiding and building up a political network, the Ottomans, or *Osmanlılar* (those who are associated with Osman), became a force to be reckoned with. They developed a *ghazi* ethos (an Islamic ideology of fighting for the faith) but also an inclusive policy of recruiting military talent of any faith. The Ottomans found a fertile ground for their raids in 1354, as they crossed into the Balkans. There they discovered a politically disunited patchwork of states that were eventually brought into the Ottoman fold. With a foothold in Europe, the Ottomans dominated both sides of the Aegean.

Slowly the majority of the other regional powers were subordinated to the Ottomans. At the dawn of the fifteenth century, the Ottomans faced a new challenge from the East: the Turkic commander Tamerlane (also known as Timur, 1336-1405). The Ottomans faced him at the Battle of Ankara (1402) and were soundly defeated. The Ottoman sultan Bayezid I (r. 1389-1402) was captured, and the Ottoman state was thrown into chaos. Between 1402 and 1413, contending Ottoman princes and former Ottoman vassals fought to fill the power vacuum as Tamerlane's empire quickly evaporated.

Slowly the Ottomans were able to reestablish rule over their old territories and solidify their state again. During the reigns of Murad II (r. 1421-1451) and Mehmed II (r. 1451-1481), the Ottoman Empire reconsolidated and began to expand. Those former vassals who had asserted their independence were brought to heel, and the empire was stronger than ever before. With the defeat of the Byzantines and the capture of Constantinople in 1453, the Ottomans established a position as the preeminent power in the eastern Mediterranean.

Military Achievement

The Ottomans were able to establish an empire centered on the Aegean, controlling western Anatolia and southeastern Europe in the fourteenth and fifteenth centuries. They unified a host of disunited states into a strong political entity. Despite defeat at the hands of Tamerlane and brief vassalage thereafter, the Ottomans became the dominant power in Anatolia, the Balkans, and the Aegean.

The Ottoman armies in this period consolidated power in most of Anatolia by defeating their principal Turkish rivals: the emirates of Aydin, Menteshe, Karesi, Saruhan, Hamit, Germiyan, Teke, and Karaman. While accomplishing this, they inflicted a series of defeats upon the Byzantines at Bursa (1326), Iznik (1331), and Edirne (1361), culminating with the capture of Constantinople (1453). While the Ottoman armies were establishing dominance over Anatolia, they also took the opportunity to become the premier power in the Balkans. After the fall of the

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The death of Ottoman sultan Mehmed II in 1481. His sack and control of Constantinople in 1453 marked the beginning of the Ottoman Empire.

Serbian Empire in 1355, the Ottomans slowly established suzerainty over the Serbian and Bulgarian successor states with major victories at Maritza (1371) and Kosovo (1389), thereby becoming the dominant Balkan power of the period. Ottoman forces were also successful against various Crusader armies sent against them, winning the day at Nicopolis (1396), Varna (1444), and Kosovo (1448). The Ottomans also had substantial success against the Venetians at Thessalonica (1430). The definitive military success of the period was the capture of Constantinople in 1453, which eliminated the Byzantines, made the Ottomans masters of the Aegean, and positioned them to become a world power.

WEAPONS, UNIFORMS, AND ARMOR

The Ottoman army was initially reliant upon a cavalry force that was used to engage in plundering raids. These forces were typically lightly armed and armored, with an emphasis on speed. They frequently armed themselves with war hammers, maces, short swords, sabers, javelins, and spears. Early Ottoman armies often wore leather lamellar armor into battle. Later, as the Ottomans came into contact with the Byzantine, Crusader, and Serbian armies, they began to adopt more substantial armor and heavier weapons. Heavy mail and plate armor was utilized frequently, which differentiated the Ottomans from most of the early Islamic armies. In addition to carrying on the Turko-Mongolic tradition of armaments, the Ottomans borrowed from the Byzantines and other European powers.

The Ottomans were known to use heavy guns during sieges as well as on the battlefield. Despite conflicting accounts of the use of artillery against the Karamans (1388), at Kosovo (1389), and at Nicopolis (1396), definitive evidence shows artillery in the Ottoman armies by 1420 and widespread use by 1440. For sieges, the heavy guns were frequently used, and these were often cast on the spot. Some of the cannons were enormous; according to certain sources, some of the cannonballs shot at the walls of Constantinople in 1453 weighed in excess of 1,900 pounds.

Ottoman armies also gradually began to utilize handheld firearms in the form of the harquebus (*tufenk*). The *janissaries* were massed among the *araba*, a series of linked wagons similar to the *Wagenburg* (a Bohemian defensive line of wagons) and used large volleys to suppress cavalry charges. These weapons were confined mainly to the janissaries and became prevalent only at the end of the fifteenth century.

MILITARY ORGANIZATION

The earliest organization of Ottoman forces was a predatory confederation drawn from nearby tribes, allies, and renegades; however, as Ottoman territorial control expanded, organizational principles were enforced. Two organizational systems were in place during this period. The first represents the initial attempt by the Ottomans to organize their army into something other than a raiding band. The second is the beginning of the form that the Ottoman army would assume in the sixteenth and seventeenth centuries.

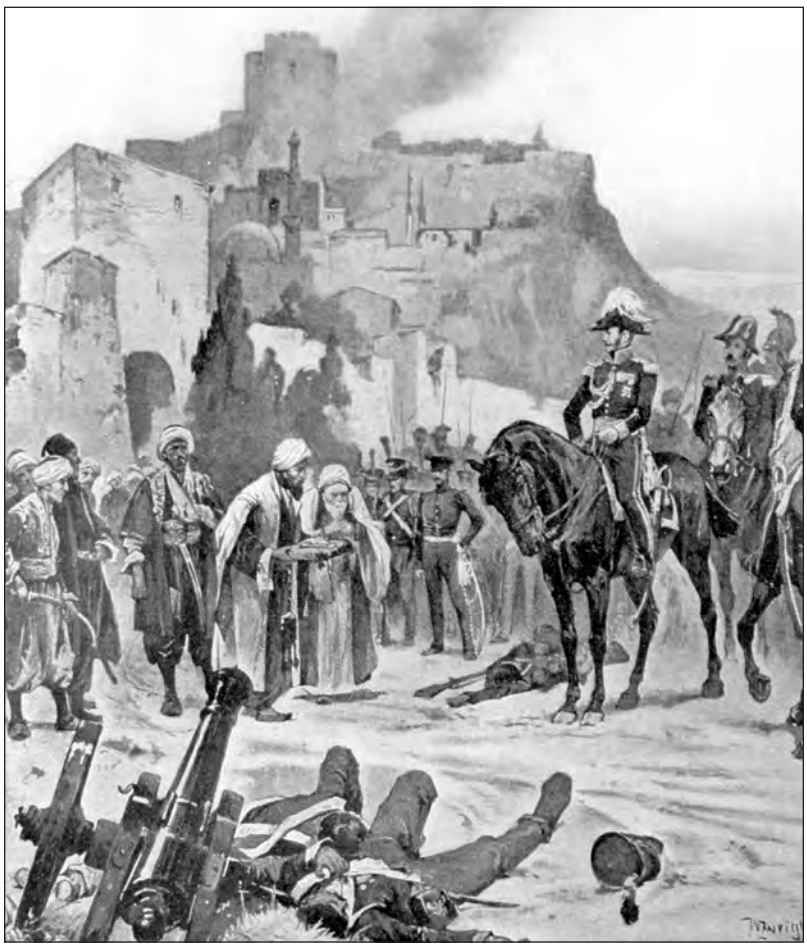
Some of the first regular troops employed by the Ottomans were known as the *müsellem* (tax-free), which were the earliest organized cavalry units, and the *yayas*, the earliest infantry forces. These groups were given land grants in return for their service. They were organized using a decimal system. This was the first structure given to the Ottoman army. However, the loyalty of these freedmen raised concerns for the Ottoman sultans and encouraged the creation of a new structure.

With the effective establishment of an Ottoman state, the principle of military slavery was enforced in the form of the Kapıulu corps. This force was made up of military slaves who were theoretically the property of the Ottoman sultan. The two principal branches of the Kapıulu were the janissaries and the *sipahis*, a cavalry force.

As the army grew, a specialized infantry force was utilized. The *yeniçeri* (the janissaries) were first drawn from prisoners of war and later from a special levy (*devshirme*) on the Christian subjects of the empire. The janissaries adopted gunpowder weapons early in the fifteenth century, particularly the harquebus, which was used with great effect in this period. This force was organized into *ortas*, or regiments, typically containing between one hundred and three thousand troops.

The *azab* corps were established in the early fifteenth century and were drawn from rural Anatolia. Utilized principally as an infantry force, they also performed a naval function later. The azabs continued as a second-line infantry force in the Ottoman army until some time in the sixteenth century.

The sipahis (sometimes rendered "spahis" in English) were cavalry forces drawn from the notables of Anatolia. Many of these forces received nontransferable land grants, *timars*, from which they drew their income and gathered their own forces in times of war. These forces were armored and generally heavily



F. R. Niglutsch

Turks surrender Varna to the Russians.

armed. "Sipahi" was also a term used for a unit from the six cavalry divisions of the Ottoman palace, which served as the bodyguard of the Ottoman sultans. These forces, along with the janissaries, formed the backbone of the Ottoman army after about 1400. There was a well-known rivalry between the sipahis and the janissaries.

In addition to these forces, the Ottomans employed various elements from vassals in the Balkans and Anatolia, particularly the Serbs. The Christian vassals of the Ottomans brought infantry forces that were often referred to as *voynuks*. These troops performed garrison duty along the Ottoman frontiers in the Balkans and joined the Ottoman army in major campaigns.

Additionally, Ottoman armies began to include units of miners and sappers who were needed to reduce the many fortifications that Ottoman armies encountered on campaign. An initial lack of these forces had hindered the Ottomans against Byzantine and Crusader fortifications. Later these forces became adept at using gunpowder and mining operations.

DOCTRINE, STRATEGY, AND TACTICS

The Ottoman armies employed a wide array of tactics against the various opponents they faced as they consolidated power. The earliest Ottoman armies were little more than raiding bands. They relied on speed and subterfuge for success, and especially upon the time-honored nomadic strategy of feigned retreat and counterattack. These forces essentially wore other forces down by attrition rather than by using field tactics to win set battles. These forces were all but ineffective against fortified positions.

Ottoman armies from the beginning and throughout the period made frequent use of light cavalry raiders, or *akıncıs*. These forces began to appear in the Balkans around 1400. Later they were drawn from Ottoman vassals such as the Crimean Tatars and the Walachians; they constantly harassed opposing armies and softened up border defenses. They kept the borders of the Ottoman Empire in a nearly constant state of war, which meant that the Ottomans' opponents had to be constantly concerned about raids. Hence, many opponents of the Ottomans in the Balkans built elaborate border fortresses. During battles, these light cavalry forces attempted to draw the enemy in toward the Ottoman strong point and the entrenched janissaries.

One of the Ottomans' most enduring tactics was the use of a fortified center on the battlefield as a rallying point. These points were often strengthened using field fortifications, such as trenches or palisades of sharpened stakes. Later the arabas were used by the Ottoman armies while on campaign as mobile strong points containing a concentration of cannons and muskets. These strong points also functioned as command centers, often housing the Ottoman sultan and his cavalry bodyguard as well as the janissaries. These formations were particularly effective against cavalry forces and led to Ottoman victories at Nicopolis (1396) and Kosovo (1448).

CONTEMPORARY SOURCES

Sources for the earliest years of the Ottoman army are scant. The Ottoman army began as a raiding confederacy and kept no real records. Of the extant sources from this period, the majority are from the perspective of the Ottomans' adversaries. The Ottoman sources of the period are also problematic, because they are laced with legends and figures from previous periods; as a result, contemporary events are difficult to disentangle—and even these sources were often written after the events they relate. Another issue is that few of these sources have been translated into English.

By the end of the fourteenth century, there were better accounts of the Ottoman military. Those available in English include Konstantin Mihailović's *Pamiętniki janczara* (fifteenth century; *Memoirs of a Janissary*, 1975), which offers a unique look into the Ottoman army from

the perspective of one of the janissaries. It provides great detail about the rigors and the lifestyle of the janissaries. *The Crusade of Varna* (2006; part of the Crusade Texts in Translation series) gives extensive information about the Crusade of Varna (1444) from the perspectives of all parties involved, including the Ottomans, the Hungarians, the French, and others. A section in this work, the anonymous "The Holy Wars of Sultan Murad Son of Mehmed Khan," provides an Ottoman perspective on this conflict. *The Siege of Constantinople: Seven Contemporary Accounts* (1972) gives great detail on the 1453 siege from the Byzantine and Genoese perspectives.

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James N. Tallon

West African Empires

Dates: 400-1591 C.E.

Political Considerations

In the period from 400 to 1591, West Africa saw the rise and fall of the indigenous kingdoms and empires of Ghana, medieval Mali, and Songhai. Although many other petty states and kingdoms arose in West Africa during this time, only Ghana, Mali, and Songhai achieved the status of full-fledged and long-lived conquest states and expansionist empires, for which contact-era Islamic and European documentary histories are available.

Ghana's emergence as the first of the West African empires ultimately set the stage for subsequent developments identified with the establishment of the kingdoms of Mali and Songhai. In each instance the intensification of trade along the trans-Saharan trade network was a critical factor underlying the expansion, influence, and institutionalization of the military orders of the day. In fact, much of the wealth generated to support the maintenance of professional armies—documented by various Islamic writers to have ranged between 40,000 and 200,000 soldiers each—was derived directly from the military and police protections afforded foreign travelers and merchants on the trans-Saharan trade corridor. With the advent and spread of the Islamic faith out of North Africa in the eighth century, new forms of commercial, religious, social, cultural, and military interaction transformed the social and political landscape of West Africa. In some instances, as with the reign of Mansa Mūsā I of Mali (1312-1337 C.E.), Islamic influence transformed the organizational structure of the empire and the administration of justice and launched the religious wars of the Islamic jihad. Subsequent kings and kingdoms either waged war under the doctrines of the Islamic tradition or sought to eradicate the Muslim tradition altogether, setting the stage for much of the military history of the kingdoms of Mali and Songhai until the emergence of the European slave trade and the introduction of firearms. These latter developments in turn fueled a long-standing pattern of internecine warfare that ultimately depopulated entire towns and regions subject to West Africa's colonial-era encounter with European merchants, militarists, and slave traders.

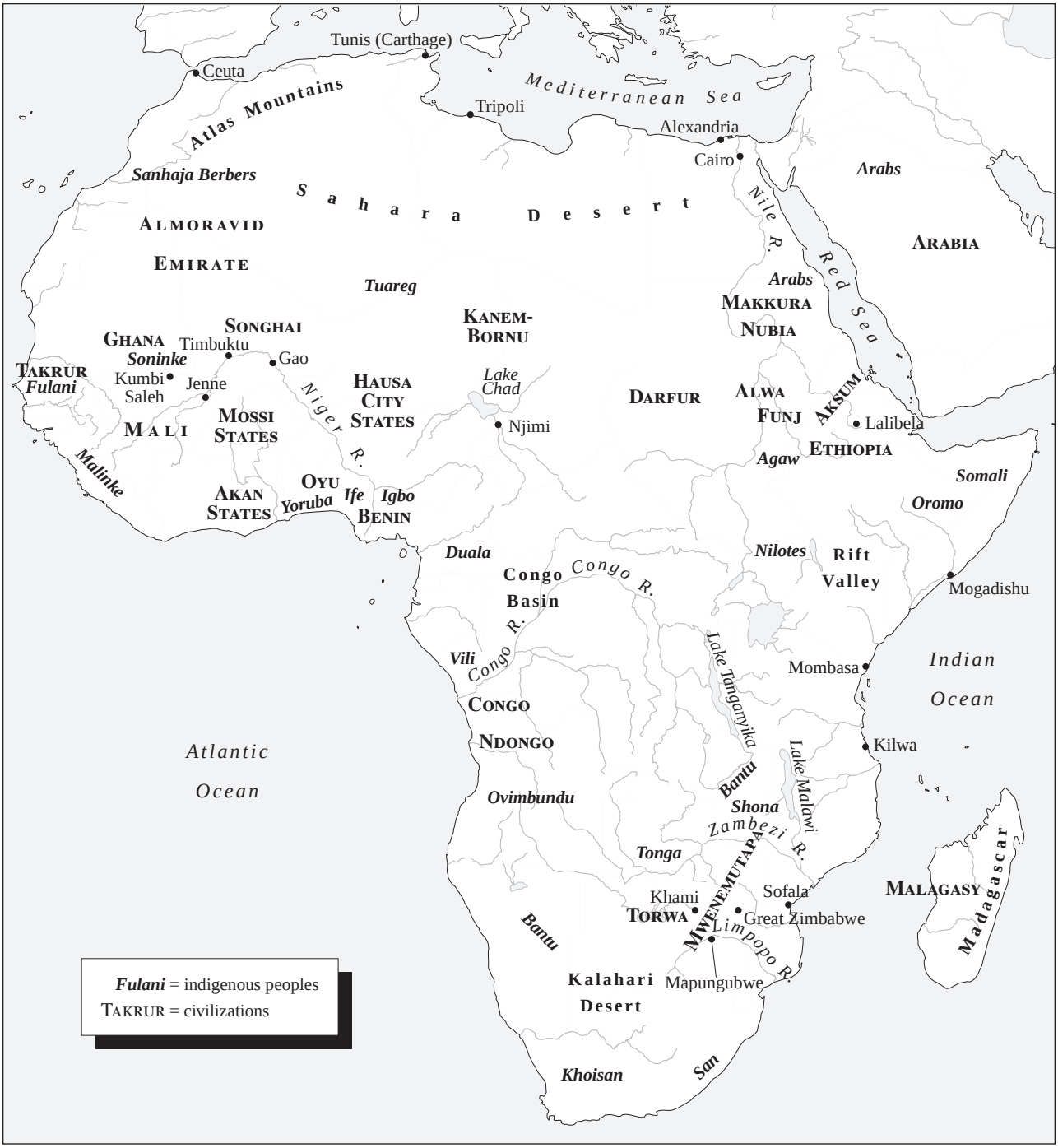
Turning Points

700-1000	Ghana emerges as the dominant kingdom and military power of the western Sudan.
1230	The kingdom of Mali is founded by a Mandinka prince after the defeat of the Susu kingdom.
1450	Songhai incorporates the former kingdom of Mali and comes to control one of the largest empires of that time.
1468	Songhai armies invade Timbuktu, execute Arab merchants and traitors, and sack and burn the city; thereby heralding a period of anti-Islamic sentiment in West Africa.
1591	Songhai is conquered by a Moroccan army consisting primarily of European mercenaries armed with muskets, the first to be used in West African warfare.

Military Achievement

Military achievement during this period centered on the emergence and mobilization of professional armies and cavalry forces; the formalization of military protocols, organizational structures, propaganda, and tactics; and the adoption of new military technologies, fortifications, and weaponry. Whereas the primary achievements ascribed to the kingdom of Ghana center on the fact that it was the first of the western Sudanese empires to establish large pro-

AFRICA, C. 1000-1500



fessional armies for the maintenance of law and order over a vast territory, the medieval kingdom of Mali in turn contributed to the formal development and mobilization of cavalry forces in the thirteenth and fourteenth centuries in order to command the battlefields of the savanna and sahel regions of West Africa. Both within and beyond the context of indigenous warfare, the kingdoms of Songhai and Benin, among others, further advanced indigenous armaments, protective armor, fortifications, tactical mobilizations, and, ultimately, the adoption of firearms.

The combined impact of the Islamic faith and the deployment of cavalry forces on the military culture of the era were most forcefully felt during the reign of the Malian king Mansa Mūsā I. Mansa Mūsā undertook the military expansion of Mali and the concomitant control and taxation of the trans-Saharan trade in salt, gold, ivory, ebony, pepper, and kola nuts. His primary contribution was the military incorporation of the Middle Niger River region into the kingdom of Mali through the use of cavalry forces and professional armies. In addition, his conquests ultimately led to the control and incorporation of the important mercantile centers and cities of Timbuktu and Gao, the trans-Saharan trading town of Walata, and the salt mines of Taghaza to the north. During Mansa Mūsā's reign the territory of Mali was doubled in size, and the capture and control of the primary salt- and gold-producing areas of the region secured the empire's wealth and stability. So famous were the cavalry exploits of Mansa Mūsā's day that one of the more notable art forms of this time consisted of relatively large terra-cotta figures of mounted cavalry troops replete with padded body armor, backpacks, elaborate helmets with chin straps, and a variety of weapons including swords and javelins. Ultimately, Mansa Mūsā's conquests and his organization of an imperial form of government transformed Mali from a regional to an international presence, with Malian ambassadors posted in Morocco and Egypt.

The kingdom of Songhai provides another prominent body of documented achievements in the use of light cavalry for the purposes of territorial gain and empire building. Malian and Songhai battle formations, or *mandekalu,* entailed the use of light cavalry forces bearing padded armor, spears or javelins, and imported swords. Such forces were highly effective in combat with enemy soldiers within the range of the savanna; however, these same cavalry forces were far less effective in the forested areas to the south of the Niger River or within tsetse-fly-ridden regions where horses were vulnerable. This was clearly the case for the Mandekalu horse warriors of the Mali Empire, whose realm was largely restricted to the West African sahel and savanna woodlands through much of the period extending from 1100 to 1500 C.E. Following on the heels of the cavalry were the infantrymen, who typically bore full armor, iron-tipped spears, and poisoned arrows.

Ultimately, the development of sophisticated military organizations, advanced strategies and tactics, effective diplomacy, and weaponry of the kingdoms of Mali, Songhai, and successor states of West Africa was such that these kingdoms largely dictated the conditions of European and Arabic commerce in West Africa well into the eighteenth and nineteenth centuries.

WEAPONS, UNIFORMS, AND ARMOR

The earliest indigenous forms of combat relied largely on the deployment of shock weapons, including short-handled wood, stone, and iron-tipped thrusting spears; javelins; iron swords; protective headgear; and bamboo shields. The use of these weapons provides a clear indication that hand-to-hand combat was a key strategy both in the sahel and savanna and in the jungle-shrouded landscapes that contained the West African kingdoms. As did the armies of other societies engaged in jungle or desert combat before the advent of firearms, those of the West African kingdoms employed thrusting spears and other shock weapons. To this ensemble of shock weapons were added projectiles, or "missile weapons," in the form of the hunting bow and iron-tipped arrow, which was a critical innovation for those infantry that accompanied the cavalry corps late in Ghana's military history. Much of this early weaponry constituted the warriors' toolkit for centuries to come. Primary innovations centered on the transition from stone-tipped wooden arrows and spears, and bows and arrows, to

iron-tipped projectiles in these same categories. The slingshot has also been documented among the weaponry utilized in combat within and between the West African kingdoms. The addition of North African, Spanish-Moorish, and German steel sabers and swords to the growing arsenals of West African weaponry indicates the growing international status and wealth of West African armies.

The kingdom of Mali eventually standardized its warriors' battle regalia and uniforms, as did the kingdoms of Ghana, Songhai, and Benin. In addition, Malian rulers introduced the so-called Honor of the Trousers. According to the twelfth century Arab author al-ʿUmarī (1301-1349), who chronicled the history of the Mali Empire, "Whenever a hero adds to the list of his exploits, the king gives him a pair of wide trousers, and the greater the number of a knight's exploits, the bigger the size of trousers. These trousers are characterized by narrowness in the leg and ampleness in the seat." Combat insignia and ethnic accoutrements were also characteristically donned by warriors, and the role of insignia, such as feathers inserted into headgear, was intended to signify rank and status within the battle formations. Fifteenth century Bini swordsmen were depicted in brass castings wearing an elaborately standardized protective armor that included armored helmets, spiked collars and breastplates, massive curvilinear swords, and war hammers.

Military Organization

According to one Muslim history of West Africa, the Songhai military, known as the Tarikh al-Fattash, was organized under the aegis of three full-time commanders or generals. The *dyini-koy* or *balama* was the commander of the army, the *hi-koy* was the admiral of the war-canoe fleet, and the *tara-farma* was the full-time commander of the cavalry forces of the empire. Each of these commanders and his respective subordinates was identified by his uniform, clothing, and insignia.

West African kings typically rose to power through either inheritance or demonstrated success as a military leader, conqueror, or facilitator of a coup. All military organization and support in West African kingdoms was directly subject to the order and mandate of the ruling king in his capacity as commander in chief. The organizational culture of each kingdom's armies varied according to the nature of the military mobilization. Slaves or other captives often served a critical support function during major military operations. Although professional armies were often renowned for their cavalry corps, they often included tens, if not hundreds of thousands, of infantrymen, backed by slaves who facilitated the

A mounted warrior of the Bornu, where cavalry was a dominant aspect of the savanna kingdom's military.

WEST AFRICA, 15TH-16TH CENTURIES

movement of cargo and supplies necessary to the deployment of troops in long-distance engagements. The combination of infantry, cavalry, and naval corps proved a highly resilient and organizationally effective military method for maintaining the long-term stability of the West African kingdoms of Mali and Songhai.

DOCTRINE, STRATEGY, AND TACTICS

The doctrines, strategies, and tactics that characterized West African warfare varied considerably through time, reflecting cultural and technological influences that affected the region through the course of nearly twelve hundred years of human interaction. The earliest recorded wars and military mobilizations of the Ghanaian peoples centered on the protection of the all-important salt trade. However, the nature of war and weaponry in West Africa evolved in response to the growing significance of iron for tools and weapons, the capture of war captives for the slave trade, and the mining of gold for commercial exchange with Arab and European merchants. Ultimately, the protection of the kingdom and its long-distance trade networks and merchants led to the formalization of professional armies and the formation of special military units within the kingdom. Despite this changing relationship between the king and his soldiers, Ghana is thought to have depended largely on civilian reserves for the mobilization of standing armies. The later kingdom of Mali expanded the role of the professional soldier and created large standing armies as well as highly disciplined cavalry forces. The kingdom of Songhai clearly epitomized the changing nature of military practice: Songhai's unceasing pattern of territorial and political expansionism served to justify the role and status of its formally institutionalized military.

Throughout the course of West African history, religious doctrine served to define and redefine the nature and transformation of military doctrine, political organization, and, ultimately, conquest interactions with neighboring states. Whereas Ghana was the dominant power of the western Sudan from 700 to 1000, the Islamic domination of North Africa and the growing role of Islam in West Africa provided a catalyst for the intensification of professional soldiering and the protection of trade with Arab merchants. Given the growing penetration of Islamic thought and culture in West Africa, the military took on a police function where trans-Saharan trade was concerned. During this period, although the protection of trade remained of paramount concern, the advent of the Islamic jihad, or holy war, signaled the beginning of wars devoted to spreading the Islamic faith and eliminating infidels, or nonbelievers. With the rise of Mali, the military took on an expansionist function, conquering the city of Gao and consolidating control over the salt and

gold trade. The heavily Islamic character of Mansa Mūsā's reign reflected a long-standing pattern of Islamic influence and status. On one hand the adoption of the Islamic tradition in Western African kingdoms increased social and cultural cohesiveness over a vast geographic region and brought about a new era of prosperity. On the other hand, the scorched-earth policy of empire building and the role of the jihad ultimately fed the decline of the kingdom of Mali and, subsequently, that of Songhai.

Medieval Sources

Early Arab and Muslim accounts of the culture, society, technology, militarism, and urban settings of the West African kingdoms are among the most authoritative and complete. Such accounts include those of the eleventh century Arab geographer al-Bakri (died c. 1094), who describes ancient Ghana in *The Book of Routes and Kingdoms*; and Mahmud al-Kati, a Muslim scholar who authored the *Tarikh al-Fattash*, or *History of the Sudan*, which was largely incorporated into the accounts of Ibn Mukhtar in his publication of the *Tarikh al-Fattash*. Among the most important historians of later periods of the kingdoms of Mali and Songhai are Ibn Baṭṭūṭah, a fourteenth century Muslim traveler, and al-Ḥasan ibn Muḥammad al-Wazzān al-Zaiyātī (c. 1485-c. 1554), also known as Leo Africanus, who wrote about his travels in *History and Description of Africa and the Notable Things Contained Therein* (1526).

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Ruben G. Mendoza

Ethiopia

Dates: c. 300-1543 C.E.

Political Considerations

The military history of Ethiopia is closely tied to political and commercial relations of the highland regions to those in the surrounding lowlands. It is also tied to the caravan trade in Nubia and to sea-based trade along the Red Sea coast, and thus to the Arabian Peninsula. Related to these geopolitical factors are religious ones: first the fourth century spread of Christianity into areas dominated by animistic and pagan religious practices, and later the seventh century introduction of Islam in the lowlands. The areas to the east, north, and west of the Ethiopian highlands retained a lively Christian religious tradition and came to view themselves as isolated island bastions of Christianity surrounded by a sea of Islam.

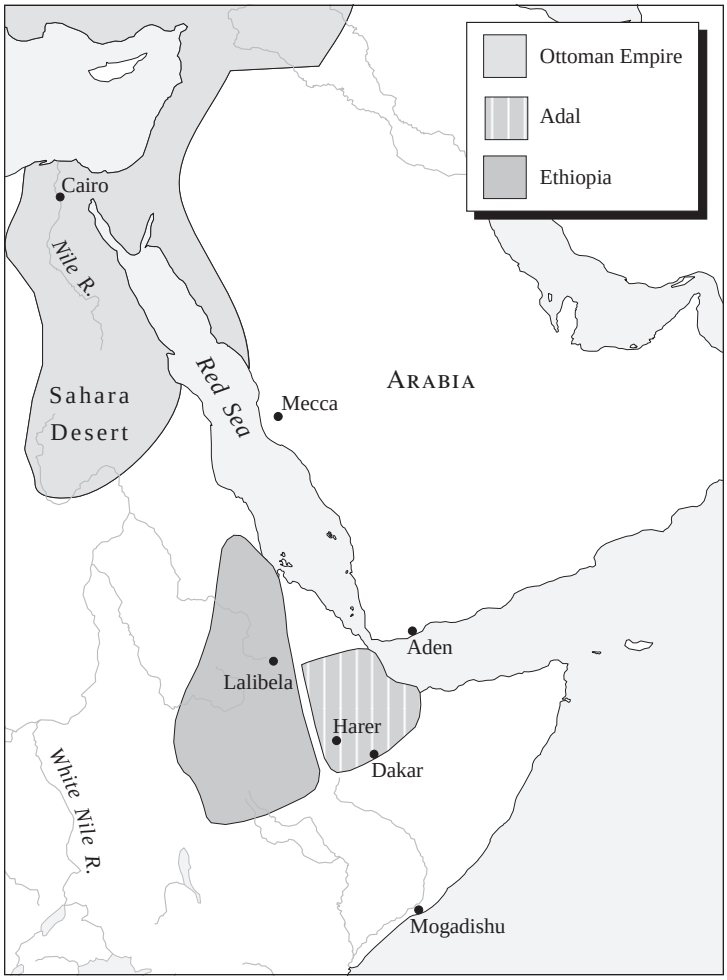
The formation of states in the Ethiopian highlands, financed by thriving commerce, dates back to several centuries before the common era. These states were increasingly influenced by Arabian culture and later by commercial ties with the Ptolemaic Dynasty subsequent to the Alexandrian imperial period in the late fourth century B.C.E. down to the emergence of the Roman Empire. The interplay of commercial wealth with the growth of numerous political states gave rise to a constant competition between the food-growing regions of the Ethiopian highlands and the commercial settlements along the Red Sea coast. Warfare increased in scale and importance during this period, as competition among local elites for the profits of trade drove them into violent confrontation. By the first century C.E., the powerful state of Aksum, centered in the Tigrayan highlands, emerged as the dominant player in the commercial contest, but Aksum acted more as a monitor over a feudal system of trade than as a monolithic state. Aksumite Ethiopians gradually expanded their dominance over the southwestern littoral of the Red Sea, attempting to dominate even the caravan trade to the north. They also established a considerable presence on the Arabian side of the Red Sea. Trade with the Roman Empire was considerable, and with the success of Christianity in that empire, it was only a matter of time before Aksumites also began to embrace the Christian faith in the third and fourth centuries. Tradition maintains that during the fourth century Christianity was more firmly established by the shipwrecked Syrian Frumentius (fl. c. fourth century). Frumentius later became bishop and successfully evangelized much of the Aksumite kingdom, which maintained a largely peaceful domination of Ethiopia and neighboring regions until its displacement from the Arabian coast by Persians in the mid-sixth century. The Aksumite kingdom was further weakened in the seventh and eighth centuries by the spread of Islam throughout Arabia, into North Africa, and along the lowland regions of the Eritrean and

Turning Points

1st cent. B.C.E.	Aksumite Ethiopians emerge as dominant players in the control of Red Sea trade.
7th cent.	Aksumite kingdom is weakened by the spread of Islam throughout Arabia and North Africa.
1314	Emperor Amda Tseyon comes to power in Ethiopia, expanding and solidifying the Solomonid Dynasty.
1529	Muslim leader Aḥmad Grāñ defeats forces of Lebna Dengel at the Battle of Shimbra-Kure, opening southern Ethiopia to Islamic rule.
1541	Portuguese musketeers arrive to help defend Ethiopia, ending Islamic threat two years later, under the emperor Galawdewos.

Somali coasts. The Aksumite Empire, deprived of its links to the Mediterranean and to lucrative trade, could no longer maintain large armies, nor rely on sea-based or caravan trade. In growing isolation from the rest of the world, the Aksumites moved south into the mountainous interior of the Abyssinian highlands, where they dominated Agau-speaking agriculturalists, assimilating much of the local population through intermarriage, cultural transplantation, and religious conversion. Still, Agau-speaking peoples fought back in peripheral areas that the centralized but by now weakened Aksumite state could not control during the tenth and eleventh centuries.

ETHIOPIA, C. 1500



The cross-fertilization of Aksum with the Agau produced a new dynasty, the Zagwe, whose most celebrated figure was the emperor Lalibela (r. c. 1185-1225), who was Agau by bloodline but thoroughly assimilated into the Aksumite Christian culture. Lalibela was unable to hold the fractious and feudal empire together, however, and was eventually defeated by the Shewan rebel and Christian leader Yekuno Amlak (fl. thirteenth century) after a series of battles that culminated with Lalibela's death. Yekuno Amlak declared himself emperor and, to bolster his legitimacy, claimed to be a descendant from the line of King Solomon and Queen of Sheba of the Old Testament. He quickly consolidated the existing empire and subdued neighboring Muslim areas. In the early thirteenth century, Emperor Amda Tseyon (r. 1314-c. 1344) expanded and solidified the Solomonid Dynasty over the divided feudal system. He established military garrisons throughout the highlands, areas difficult to govern even in the best of times, given their remoteness and inaccessibility. He also encouraged Christian evangelization. The order instituted by Amda Tseyon increased both the economic activity and wealth of the area, as he extracted tribute from his locally appointed administrators and feudal lords. Amda Tseyon attacked Ifat, a Muslim area that had earlier provided tribute. When troubles in the empire called his attention elsewhere, however, the Ifat Muslims responded by declaring a holy war in 1332. Amda Tseyon responded vigorously and with great military brilliance. Against the highly mobile Muslim units, he used his army effectively to isolate and attack the weakest Muslim units, fielding decoy columns to keep the Muslim-federated troops off-balance and always on the defensive. Eventually he thoroughly routed the Muslim forces and substantially expanded the extent of his empire. Subsequent Ethiopian kings built on his success by fostering Christianity as a unifying force in an otherwise feudal economic system. However, not all Muslims in

the empire converted, and thus they remained a group susceptible to mobilization when outside Muslim forces intervened.

From the fifteenth to the sixteenth century, the greatest threat to Ethiopia proved to be the Islamic peoples of the northern and eastern lowlands and the Oromo peoples to the south. Under the reign of Lebna Dengel (fl. sixteenth century), Islamic rebellions were put down, but increasing pressures were placed upon the lowland grazing grounds of both Somali and Oromo peoples to the south and east. The Somalis and Oromos gradually migrated into Muslim upland areas under Lebna Dengel's control, precipitating constant turmoil in these areas. Muslims eventually responded with the jihad of Muslim leader Aḥmad ibn Ibrāhīm al-Ghāzī, known as Aḥmad Grāñ (1506-1543), "the left-handed," who trained a disciplined group of warriors in the art of highly mobile warfare, made more deadly by the introduction of firearms obtained from the Ottoman Turks. Aḥmad Grāñ's smaller fighting force defeated the larger but disunited armies of Lebna Dengel at the Battle of Shimbra-Kure (1529), opening much of the southern part of the Ethiopian Empire to Islamic rule.

Lebna Dengel died in 1540, still in control of the highland region of his country. His appeal to Portugal eventually paid off, when in 1541, about 400 Portuguese musketeers disembarked and made their way to Abyssinia's support. With this firepower, Ethiopian forces won their first victory over the forces of Aḥmad Grāñ, who, stung by defeat, turned to the Ottoman Turks for additional support, which was granted. With nearly a thousand Turkish mercenaries armed with muskets and cannons, Aḥmad Grāñ defeated the Ethiopian-Portuguese forces in 1542. Subsequently, however, under the emperor Galawdewos (r. 1540-1559) the Ethiopians shifted to hit-and-run warfare, and eventually Aḥmad Grāñ was killed in 1543, thus ending the Islamic threat to Ethiopia. The gradual rise of the largely animistic Oromo peoples along the periphery of the Ethiopian Empire in subsequent years further insulated Ethiopia from direct contact with Islamic forces.

Two ancient Ethiopian warriors spar with each other.

MILITARY ACHIEVEMENT

Throughout the history of Ethiopia, military activity tended in its tactical and technological dimensions to lag behind that of other regions. Although Ethiopia was not known for its military innovation, military leaders of both the Ethiopian state and of rebel groups along its periphery were quick to adopt tactics and methods of warfare suited to their immediate needs. Their tactics were further reinforced by changing economic conditions over time. When the central state was stable and encouraging to economic growth and commerce, more revenues were available to maintain larger armies. Tactics for maintaining control of an expanding state included the garrisoning of soldiers in hinterland regions. The interconnection of military policy with that of religious evangelization was critical to the expansion of his empire during the reign of Amda Tseyon.

Appeals by contending forces to external assistance and to the latest weaponry were hallmarks of warfare in the region during the sixteenth century, as each side sought to increase its firepower.

WEAPONS, UNIFORMS, AND ARMOR

The spear was the principal traditional weapon of the Ethiopian warrior. For defense, warriors carried shields. Uniforms consisted of full and colorful pants and long-sleeved shirts. Caps and capes of cloth or fur were worn for warmth in the cool of the highland regions. Rebel and Muslim armies in the lowlands also fought with spears and sabers, although their dress was much lighter, befitting the hotter and dryer conditions of the desert lowlands. Only in the early sixteenth century were firearms and cannon introduced into the warfare of the region, typically with the deployment of mercenary forces familiar with the new technologies. Rebel forces in the lowland regions used camels for transport and cavalry.

MILITARY ORGANIZATION

Military organization varied significantly throughout Ethiopian history. Feudal and clan warfare marked by temporary and shifting alliances of small militia-like forces were perhaps the most common and persistent manifestations of warfare during most of the period from the fourth to the sixteenth centuries. During periods of expansion of the central state such as those of the Aksum Dynasty from 300 to 500 and the Solomonid Dynasty of the fourteenth and fifteenth centuries, larger armies were maintained. During periods of central governmental weakness, the various isolated areas broke down along lines of feudal lordship, as did the armies. Under stronger emperors, greater unity of command and control over the military forces were in evidence.

DOCTRINE, STRATEGY, AND TACTICS

As in the area of military organization, so in the areas of military doctrine, strategy, and tactics, a great deal of variation is exhibited in Ethiopian military history, and this variation was itself the result of changing circumstances and necessity. For example, when Amda Tseyon was faced with full rebellion in the predominantly Muslim areas of his country in 1332, he deftly used his military forces in a highly mobile warfare that prevented the rebels from ever mounting a successful counterattack in force. By gradually defeating smaller units apart from any main body of forces, the emperor was able to win victory over otherwise fairly mobile rebel forces. By forswearing a conventional positional strategy and by using superior numbers, Amda Tseyon bested the rebels in their one potential advantage, mobility.

Similarly, Aḥmad Grāñ, by using hit-and-run tactics, largely crippled Lebna Dengel's forces during the jihad of 1527 to 1543. The Ethiopian forces, though far superior in number, fought a more conventional and positional war strategy that proved unable to match Aḥmad Grāñ's highly motivated and carefully trained forces, who were armed with some firearms and under a clear chain of command. Dengel's forces, though larger, were divided by feudal loyalties, proving no match for Aḥmad Grāñ's better-trained and better-led army. When Portuguese muskets arrived to tip the balance slightly against Aḥmad Grāñ, he sought further outside support and firepower, regaining the advantage. Under Emperor Galawdewos, Ethiopian forces shifted strategy and, like Amda Tseyon before them, employed hit-and-run tactics, thus turning Aḥmad Grāñ's own tactics against him. This plan eventually succeeded because Aḥmad Grāñ was fighting on unfamiliar ground, whereas the Ethiopians were defending their own mountainous territories. With this strategy, the Ethiopians caught Aḥmad Grāñ alone with only a small force and were thus able to trap and kill him. Clearly, Ethiopian military figures were capable of assessing the threats and forces they faced and of adapting their strategies and tactics to the demands of changing situations.

ANCIENT SOURCES

The history of East Africa is based in several different types of sources: African oral tradition; African, Arabic, and European writings; archaeological artifacts such as the stelae at Aksum and the inscription of King Ezana of Aksum (c. 325 C.E.); and local histories such as a collection of writings in Kiswahili on the history of the East African coast, including the "Kilwa Chronicle" and the "History of Pate." For the ancient period, oral tradition forms an important source of information—if one that must be approached carefully to filter out bias and in combination with other sources to fill gaps. Local historians transcribed some of these oral histories and offered their own contemporary observations.

Classical accounts of ancient Ethiopia can be found in the third book of Herodotus's *Historiai Herodotou* (c. 424 B.C.E.; *The History,* 1709); *De bello Africo* (49-45 B.C.E.; *Commentaries of the African War,* 1753), attributed to Julius Caesar but possibly by a Roman soldier; various passages of Strabo's *Geōgraphica* (c. 7 B.C.E.; *Geography,* 1917-1933); book 5 of Pliny the Elder's *Naturalis historia* (77 C.E.; *The Historie of the World*, 1601; better known as *Natural History*); the *Periplus maris erythraei* (first-third centuries C.E.; *The Periplus of the Erythraean Sea*, 1912); and book 1 of *Polemon* (c. 551 C.E.; *History of the Wars*, 1960), by Byzantine historian Procopius of Caesarea.

A sense of what East Africa and the region that came to be known as Ethiopia were like during the fourteenth century can be gained from reading book 4 of *Tuḥfat al-nuẓẓār fi gharaʿib al-amsar wa-ʿajaʿib al-asfar* (1357-1358; *Travels of Ibn Battuta,* 1958-2000, best known as the *Riḥlah*).

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Robert F. Gorman

THE MEDIEVAL WORLD

EASTERN AND SOUTHERN ASIA

China
Medieval
Dates: 581-1644 C.E.

Political Considerations

After the collapse of the Han Dynasty in 220 C.E., China drifted into a period of political chaos during which it was controlled by a number of rival regional kingdoms. However, by the sixth century, Yang Jian (Yang Chien), also known as Wendi (Wen-ti; 541-604), a successful military commander, had won the support of the majority of the regional leaders in the north to reestablish a central authority that eventually brought most of traditional China under his control. By 589 the Sui (Sui) Dynasty (581-618) had set in motion a number of reforms that increased and stabilized the Chinese standard of living. Yang Jian instituted a new system of taxation that brought needed financial relief to most of the peasantry. He also constructed a series of regional granaries, which both lowered prices and ensured the equal distribution of food. This newfound prosperity was short-lived, however, because the emperor was assassinated by his eldest son, Yangdi (Yangti; 569-618). As emperor, Yangdi began a series of extensive civil engineering projects in an attempt to improve transportation and tie the vast empire together. He also started a series of military campaigns to gain control of the northern portion of the Korean Peninsula. Both actions greatly disrupted the economy and were especially hard on the peasant population. Violent political uprisings broke out in every corner of the empire, and Yangdi was finally assassinated by a group of his ministers in an attempt to quell the fighting and reestablish political order.

This internal dissent severely weakened the Sui Dynasty, and in 618 Li Yuan (Li yuan; 565-635), the duke of Tang, took advantage of the situation to establish the Tang (T'ang) Dynasty (618-907). Li Yuan's first action was to restore the traditional scholar gentry as the foundation of the government bureaucracy, returning the intellectual class to the study of Confucian philosophy and reinstating the national examination system as the entry into government positions. These actions produced a class of neo-Confucian scholars that would have a profound ethical impact upon China's civil and military services. Most important, this new intellectual class believed the major function of Confucian philosophy was to develop an individual moral code. This new philosophical system would impact Chinese society in important ways. The scholar gentry became very xenophobic and rejected all alternative worldviews as inferior. This narrow focus on a strict social structure stressed tradition and fought any political, economic, scientific, or technological innovation. The gentry's emphasis on individual moral growth clashed with the harsh realities of the martial arts and resulted in an antimilitary bias among the Chinese intellectual class.

Under both the Tang and Song (Sung) Dynasties (960-1279), China experienced widespread economic growth, which in turn gave birth to a Chinese golden age. This success was based upon the development of the agricultural potential of southern China, most significantly in the production of rice in the Yangtze (pinyin, Chang) River Valley. The future of China would now be determined by the link between the bureaucratic north and the agricultural south. To solidify this crucial relationship, the government constructed the Grand Canal, a magnificent civil engineering project that was, in its time, the largest human-made waterway in the world. The canal increased transportation throughout the country, both accelerating trade and creating a sense of unity. The maintenance and protection of the Grand Canal became a major focus of the Chinese military. In times of con-

flict, this waterway allowed the emperor to move troops swiftly to any trouble spot.

With China's great economic success came a softening of Chinese society, widespread political corruption, and a series of weak and incompetent emperors who eventually sapped the energy of the empire. In particular, the effectiveness of both the bureaucracy and the military was decreased, helping to create the conditions for the Mongol conquests at the beginning of the thirteenth century. These nomadic warriors first entered China at the invitation of the declining Song Dynasty. The emperor hoped that they would engage and destroy the Jürcheds and the Jin (Chin), two northern nomadic tribes that threatened to invade China. In 1234 the Jin were defeated by a Sino-Mongolian military alliance, but then, in direct violation of that agreement, the Song attempted to occupy the newly conquered land and extend their empire into the northern territories. This action shattered the alliance and set in motion the Mongol conquest of China and the establishment of the Yuan Dynasty (1279-1368).

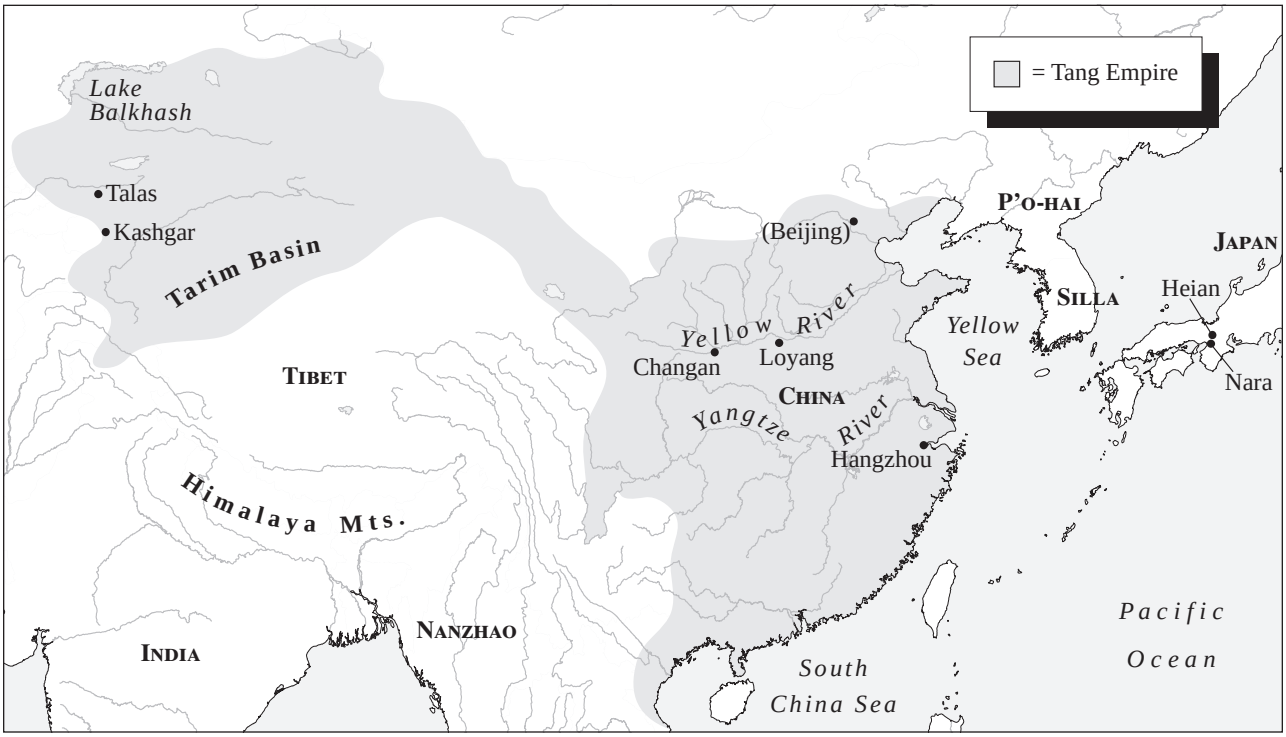
The Mongols would have a significant impact upon Chinese history. They established their capital at Beijing and abolished the bureaucracy based upon Confucianism and the examination system. These actions were taken specifically to negate the influence of the scholar gentry. The Mongols eventually adopted many aspects of Chinese culture and aggressively promoted its literature and art. Despite this openness, the Mongols were never able to find a solution to the Sino-Mongolian ethnic rivalry. Most of the intellectuals from the gentry class considered the Mongols to be uncouth barbarians. This ethnocentricity was exacerbated by the gentry's resentment of the abolition of the state examination system, which blocked the gentry from gaining access to the highest levels of political power.

After the death of Kublai Khan (1215-1294), the Yuan Dynasty fell into a period of decline. There were essentially four reasons that this took place. First, the southern region was occupied by a large number of activists who had remained loyal to the Song Dynasty. As the Yuan declined, many of these disenchanted groups were emboldened to take political action that eventually resulted in an empire-wide revolt. Second, Yuan military prestige also suffered a severe blow from two disastrous military expeditions against Japan in 1274 and 1280. Third, Yuan military failures were founded in the general weakness of the post-Kublai Khan government that was beset by deep-seated corruption within the political bureaucracy. By the middle of the fourteenth century, the Mongol government was far too weak to maintain its control over all of China. Fourth, the increase in peasant uprisings and the rise of secret revolutionary societies resulted in a series of disastrous insurrections that finally forced the Mongols to withdraw to their ancestral homeland.

By 1368 the Ming Dynasty (1368-1644) had been firmly established, and, from the very beginning, the new leadership made a concerted effort to reinstate the important Chinese institutions that had been suppressed by the Mongols. Most important, the Ming emperor restored the power of the scholar gentry. Confucianism once again became the dominant philosophical system and served as the basis for the renewal of the civil service examination system. In the first decades of Ming rule, the emperor began to develop a truly global perspective. China became a major force in Eastern trade, and by the 1400's it controlled the extensive and profitable Indian Ocean trade. China experienced an unprecedented age of economic growth that impacted every sector of Ming society. China at this time truly ruled the oceans of the world. From 1405 to 1433 no other civilization could match China's marine technology. During this time the great Ming imperial fleet made seven extensive voyages to every major port from the South China Sea to the east coast of Africa. Products from throughout the Eastern Hemisphere flowed into the markets of the empire. Most important, the latest geographic, medical, and scientific knowledge became available to the Ming Dynasty. However, as China was poised to become the first world empire, the emperor decided to adopt an isolationist policy and completely dismantled his great world navy.

This profoundly important historical act was the result of an intellectual battle between the newly established Confucian scholar gentry and a group of Mongolian technocrats led by the famous admiral Zheng He (Cheng Ho; c. 1371-c. 1433). This contro-

The Tang Empire, Eighth Century



versy was fueled by a fifteenth century Chinese "postmodern" worldview based upon the scholar gentry's fear of the new scientific and technological class. The scholar gentry realized that this new group, with their knowledge and skill, could very well dominate the development of China's economic, defense, and social policies. These scholars were influenced by the strong Confucian ideal of isolationism and tradition, rejecting the idea of internationalism. Finally, the knowledge base upon which the scholar gentry entered government service was founded in their ancient classical texts. The new sciences of modern astronomy, navigation, and marine engineering were both foreign and threatening to this bureaucratic elite.

The gentry were victorious against the technologists because they successfully implemented a three-pronged attack. In their argument to the emperor they first appealed to the ethnocentric tendencies inherent to Chinese culture. The name "China" itself means "Middle Kingdom," and traditional Chinese thought regarded the country as occupying the prestigious position in the center of the world. This view lent credence to the argument that China had nothing to learn from the world beyond its borders. Second, the gentry emphasized the superiority of classical knowledge, from which the traditional political philosophy of the Tian Ming (T'ien Ming), or "mandate of Heaven," the idea that an emperor was conferred directly from Heaven the right to rule, had evolved. Finally, because there still existed within Chinese society a profound hatred of the old Mongol regime, the Confucians were able to use the ethnicity of these technologists, most of whom were descendants of the Yuan Dynasty, against them to bring the emperor over to the gentry's side. Eventually, a decree came forth from the Ming Dynasty that China's navy would remain in port, and that future funding of this great fleet would be canceled. In just a few short years the most sophisticated navy in the world fell into decay and eventually disappeared.

At first glance, the Ming Dynasty would seem to

have survived its neo-isolationist policy, but in fact the opposite was true. By the mid-sixteenth century it was evident that the empire had entered a state of decline. A series of incompetent emperors created an environment of corruption that led to a drastic reduction in the effectiveness of the government. This widespread inefficiency had the greatest impact in the area of public works. Corrupt officials allowed the agricultural infrastructure of dikes and irrigation canals to fall into a state of disrepair, creating conditions that resulted in famine and starvation. The government lost its mandate of Heaven, and the countryside was ravaged by peasant uprisings. The resulting political chaos led to the fall of the Ming Dynasty.

MILITARY ACHIEVEMENT

Military events also played an important role in Chinese affairs during the era between the rise of the Sui Dynasty and the fall of the Ming Dynasty. Yang Jian, the founder of the Sui Dynasty, used his prestige as a great military leader to bring all of China under his control. Despite his military success, however, he was unable to establish a lasting peace. His new government was beset by revolts, and he reacted to this chaos by implementing an authoritarian style of government. His greatest threat came from the disaffected population in the south, where he sent his two most trusted generals to crush any resistance to imperial authority. The emperor then instituted a policy of forced labor, which concentrated on the construction of the Grand Canal and the restoration of more than 1,000 miles of defensive walls on the empire's northern borders.

Yang Jian's two major military problems were the constant threat of invasion from the northern steppe and the fear of rebellion. In an attempt to control the military, he issued a series of decrees that placed all army units throughout the empire under the direct control of local civilian officials. These loyal bureaucrats were also directed to confiscate all privately owned weapons and store them for possible military use.

Yang Jian also began an expansionist policy, and his primary goal was to return Vietnam to Chinese control. In 602 he sent an expeditionary force to Vietnam, where his army was devastated by both stiff resistance on the part of the Vietnamese and a deadly virus that killed hundreds of soldiers.

The emperor's son Yangdi used this disaster to organize and execute an assassination plot, which brought him to the throne in 604. The young emperor also had plans for extending the borders of the empire, and in 607 he led an army that marched westward against the T'u-yü-hun, a band of nomadic warriors that had recently negotiated a military alliance with the Koguryo, the most powerful dynasty in the northern Korean Peninsula. Fear that such an agreement would prove a threat to China, Yangdi initiated a military campaign against this potential rival. The Koguryo took advantage of the mountainous landscape of northern Korea, fortifying their towns and implementing a defensive strategy against the invading Chinese. Stifled by this tactical policy, the emperor's army fought a long, difficult, and unsuccessful campaign, and Yangdi returned home to find his empire in open rebellion.

Li Yuan, the duke of Tang, took advantage of this military disaster to increase his power in the area. In 617 he successfully negotiated an alliance with the Turks, who agreed to supply men and horses to the duke's army. Secure in this new military arrangement, Li Yuan moved against the Sui. After a disastrous military campaign in which his forces were soundly defeated, Yangdi died. The duke of Tang, upon hearing of these events, declared himself the new emperor of China.

Li Yuan adopted a military policy that proved to be very successful. The Tang Dynasty used the mountains in the west as a natural fortification against invasion from the central Asian steppe. The new emperor was also very generous to the Sui army, and he implemented the enlightened policy of granting both the enlisted men and officers from defeated armies positions in his armed forces. This policy not only increased the effectiveness of his military but also ended any possibility of a future military uprising by the Sui forces.

Li Shimin (Li Shih-min; 600-649), the duke's son, was also a major factor in the military success of the Tang. He was a great tactician and was famous for his

use of cavalry. Concerned about his father's advancing age and emboldened by an important victory against peasant rebels in the Yellow River Valley, Li Shimin forced his father's abdication and assumed the Tang throne. He governed China for twenty-three years and became one of the most successful military leaders in Chinese history. He launched an ambitious plan to enlarge the territory of the empire, beginning this quest with an important victory over the Turks in 629, during the Sino-Turkic War (629-630). The success of this campaign so enhanced his international reputation that both the Persian and Byzantine Empires sent representatives to his court. Li Shimin continued to expand his empire, and by the time of his death in 649, the borders of China stretched from Tibet in the south to Lake Balkhash in the west. Tang military power continued into the next century. From 663 to 668 the Chinese fought and defeated the Japanese in the War of Kokuryo, uniting all of Korea under one rule, subject to China.

After he had secured the eastern border, the Tang emperor returned his attention toward the west. From 736 to 755 a series of successful campaigns extended the borders of the empire to the Pamir range, bringing the Tang to the frontier of Islamic civilization and placing these two great eighth century powers on a collision course. This Sino-Islamic crisis reached a flash point at the Battle of Talas River (751), a bloody confrontation that lasted for five days. The armies of Islam ultimately defeated the Chinese forces, ending Tang westward expansion.

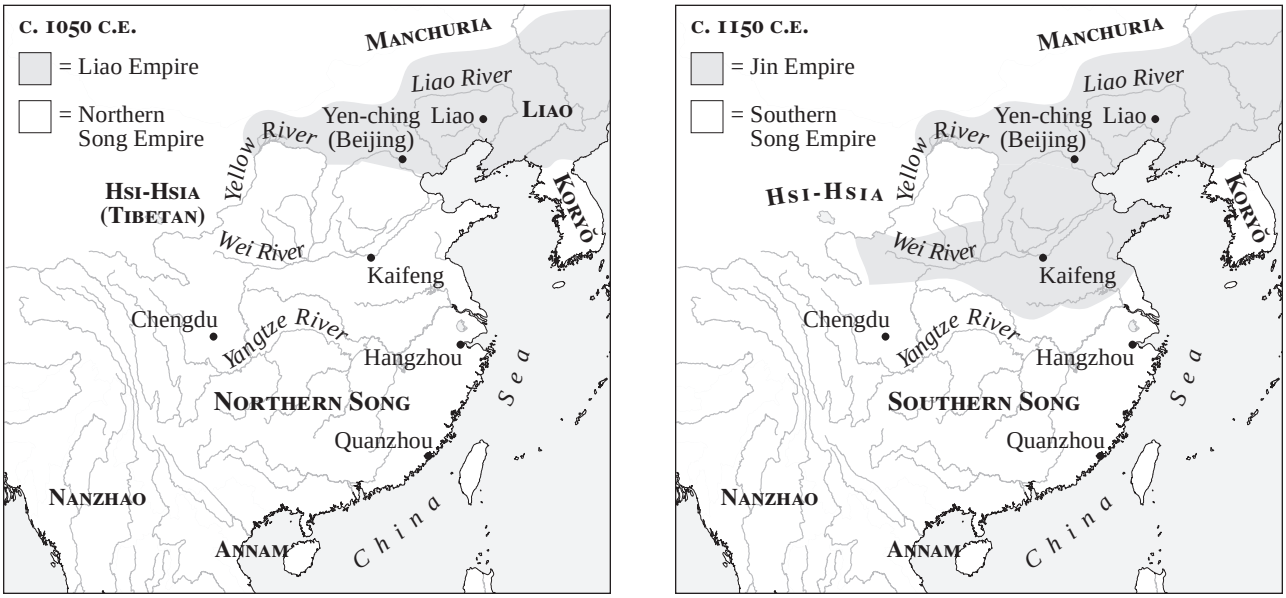
This defeat marked the beginning of the Tang Dynasty's decline. Decades of military campaigns had taken a toll on Chinese society, and the losses in both revenue and productivity were significant. These problems led to widespread civil unrest, which devastated Chinese society. For more than one hundred years, the emperors and their bureaucracies had failed to return the empire to a state of normalcy, and by 884 the Tang Dynasty was shattered.

With the final collapse of the Tang Empire in 907, China fell into a chaotic intermediate period referred to as the time of the Five Dynasties (907-960). None of the dynasties was able to unify China, and order was finally restored in 960, with the establishment of the Song. Most historians refer to the Song as the world's first modern state, and its emperors were traditionally antimilitary. The government, in constant fear of an armed takeover, made strong efforts to limit the army's power. The Song created a military model that placed their generals under the control of the civilian bureaucracy, resulting in the military's lowered prestige and appeal for the aristocratic class. In time, the military came to be dominated by the lower echelons of Song society, and by the middle of the eleventh century enlisted men were receiving one-tenth of their former wages. This lowered pay caused great economic hardship, and mutinies became commonplace.

The Song government was faced with significant financial difficulties. The population of China had reached 140 million, and vast amounts of money had been set aside for the construction of large-scale irrigation projects. The empire had to import the vast majority of its cavalry horses, which also cost a considerable amount of money. China's underfinanced military was grossly ill-equipped to meet the security challenges of the nomadic horsemen of central Asia. The Song bureaucracy responded to this problem by adopting a military philosophy based upon the concept of strategic defense. Money was allocated for the construction of massive fortifications that would frustrate the light horse cavalry tactics of the nomadic armies. The military theory that all defensive structures are eventually neutralized by an opposition force came to pass in the last years of the Song Dynasty. When the Song-Mongol military alliance broke down, the aggressive Mongol warriors quickly defeated the demoralized forces of the emperor and established the Yuan Dynasty. Between 1200 and 1405 the Mongols conquered Tibet, Russia, Iraq, Asia Minor, and southern and eastern Europe.

By the middle of the fourteenth century, the Yuan Dynasty began to decline. Years of famine gave rise to peasant unrest, and a secret religious sect known as the White Lotus spread anti-Yuan propaganda concerning the reestablishment of the Song Dynasty. In turn, the White Lotus also supported a peasant rebel organization known as the Red Turban movement. Fighting broke out between the Yuan forces in the south and the rebel armies. The success of these armies was primarily due to the fact that the Yuan had

THE SONG DYNASTY, C. 1050-1150



failed to keep the system of defensive walls under repair. The Yuan's nomadic heritage and military success were based upon swift cavalry movements, and a defensive mindset was totally alien to them. Eventually, the Mongols were able to defeat the rebel armies, but they were never able to regain complete political control of southern China.

From 1351 to 1368 the Mongols were involved in a series of military campaigns against Chinese forces in the south, in which they suffered a series of disastrous setbacks. The Mongols decided to abandon much of their territory and returned to their ancient homelands in the north. This strategic withdrawal marked the beginning of the Ming Dynasty (1368-1644).

The new Ming emperor and his intellectual elite modeled themselves after the Song Dynasty. Like the Song the Ming adopted an isolationist policy that kept the government's focus on protecting the homeland.

WEAPONS, UNIFORMS, AND ARMOR

The development of Chinese weaponry between 589 and 1644 reflected the dominant military philosophy of the most prominent dynasties. The Sui, Tang, and Song military policies were oriented toward the defense of the "Middle Kingdom." This attitude was reinforced by Confucian philosophy, which questioned the ethical status of militarism. Finally, the emperors also feared the possibility of a coup d'état. These factors made the development of the infantry the major focus of these dynasties, and weapons development reflected this orientation. Every infantryman received training in the use of both the sword and the spear. The most important weapon in the early Chinese arsenal was the crossbow, which had a devastating impact on enemy ground forces. As tactics evolved, the crossbow became both more sophisticated and more specialized. The military developed different types of crossbows that were used against infantries and cavalries and finally a series of bows that propelled fire-arrows to aid in the penetration of defensive walls.

The most important weapon used in sieges was the catapult. This technology had existed since the time of the Han Dynasty, but it was perfected under the Song. Three basic types of stone throwers were utilized by the Song, ranging from small, highly maneuverable machines to large siege weapons that were

used to destroy permanent fortifications. The Arabs also introduced the Chinese to the use of naphtha, an oil-based chemical mixture that burned on contact with water. This weapon was oriented toward naval warfare and proved devastating when wind conditions allowed its use.

The defensive, infantry-oriented philosophy of the Song changed with the onset of the Yuan Dynasty. The nomadic heritage of the Mongols emphasized constant movement. The most important weapon in the Yuan arsenal was the horse, a small, sturdy, and highly maneuverable Asian breed. A Mongol cavalryman was taught to ride by his mother at the age of three, and by the time he was ready for military service, he could both eat and sleep in the saddle. These mounted warriors were armed with a compound bow that had a force of 166 pounds and a killing range of 300 yards. Each warrior carried two bows and two to three quivers of arrows, some with small heads for distance and larger ones for close-in fighting. Both the rider and horse were protected by armor that consisted of a series of leather or iron strips and was quite effective against swords and spears.

The Ming made improvements to traditional weapons, such as the crossbow and catapults, and initiated significant progress in the use of gunpowder and explosive devices. Small handheld grenadelike projectiles became commonplace in Ming infantry units, and the shrapnel produced in the explosion of these bombs was quite deadly. The Ming also developed accurate rockets that were used to bring down wooden fortifications. These projectiles were usually launched from wheelbarrows, and their maneuverability made them a valuable addition to the Ming arsenal. The most significant development in weaponry during the Ming Dynasty was the construction of the Great Wall. China, because of its emphasis on defense, had a long history of using defensive walls as part of their arsenal. This strategy extends back to the Qin (Ch'in) Dynasty (221-206 B.C.E.) in the third century before the common era. As the result of both internal problems and foreign invasion, most of these walls became inoperable. Soon after the Ming came to power they began to construct a series of defensive walls to protect China from invasion from the north. By the mid-sixteenth century China once again found itself threatened by a new Mongol army. To counteract this threat the Ming government began the construction of the Great Wall, actually a series of fortifications linked by a defensive wall. Ironically, China's main danger did not come from the central Asian steppe but from the sea. The European armies that entered China all possessed the technology to overcome this Great Wall.

Military Organization

The Sui based their military organization upon a military and social philosophy that emphasized the obligation of the social elite to provide service to the state. The military leadership of the Sui came from old, established, aristocratic families, and their traditional social values formed the foundation of the Sui military organization.

This orientation toward service continued during the Tang Dynasty but was tempered by the impact of Confucian philosophy. The Tang armed forces consisted of six hundred militia units that ranged in size from eight hundred to twelve hundred men. Control of the army was transferred from the old aristocratic families under the Sui to the scholar gentry that now ran the newly formed Ministry of the Army. The armed forces were divided into two basic groups, the infantry and cavalry, with sections divided into smaller units consisting of two hundred, fifty, and ten men. The Tang also developed a permanent cadre of professional officers, and the enlisted ranks consisted of men who rotated to duty for a specific number of months. This system was established so that soldiers could support themselves through agriculture, thus reducing the government expense of supplying the army. In times of great military danger, the Tang would also employ mercenaries to increase the size of its armed forces.

By the early eighth century, the cost of sending a large expeditionary force to a particular trouble spot became too expensive. The ministry created nine frontier commands and adopted the philosophy of a defensive army. By 737 the militia was replaced by a totally professional armed force, and these units were

placed in the region of a powerful provincial official who would make decisions about their deployment. Each group constructed a fortified base of operations that served as a regional sanctuary in times of trouble.

The military strength of China began to decline under the Song Dynasty. The emperors were so fearful of a military uprising that they dissolved the successful organizational model that had evolved during the Sui and Tang Dynasties. They took control of the military decision-making process away from the generals and placed it under the tight control of the civilian government. Most important, the Song emperors used the enlisted ranks of the army as a social welfare program, providing employment for the poorest sectors of society. This system lowered the status of the military, and by the middle of the eleventh century the average enlisted man was receiving about one-tenth of his formerly allotted wages. This great inequity decreased the operational effectiveness of the army and eventually caused numerous mutinies.

The military organization under the Yuan Dynasty reflected the aggressive, loyal heritage of nomadic warriors, and was based upon the decimal system, with the smallest and largest units consisting of ten and one thousand men, respectively. Within the Mongol organization, each individual soldier occupied a unique position in the unit and was responsible to perform a specific task. The Mongol army was always divided into three operational units that controlled the left, right, and center of any military operation. All individuals within the Yuan armed forces were expected to carry out the necessary functions of a successful soldier. Both generals and enlisted men stood guard duty, and every member of the unit strictly obeyed the orders of his superior. Promotion was based upon skill, and it was quite common for a commoner to rise to the level of a great general. The martial qualities of bravery, discipline, and strength made the Mongols a very successful military organization.

The Ming military organization mirrored that of the Song. Its focus was directed primarily toward the defense of China and the control of the military. The government implemented a system that divided the country into military districts under the control of the civilian leadership. The logistics, supply, and training for the military were controlled by a Board of War.

DOCTRINE, STRATEGY, AND TACTICS

Military strategy and doctrine in the period between 581 and 1644 were profoundly influenced by the writings of China's great ancient military philosophers. These theorists were in turn influenced by the important philosophical systems that dominated ancient Chinese intellectual life. The four most important early schools of thought were Confucianism, Mohism, Daoism, and Legalism. Both the ethical codes and social models espoused by these philosophies formed the intellectual framework in which China's military theories were constructed.

Confucius (551-479 B.C.E.), who wrote prior to the Warring States period (475-221 B.C.E.), believed that China's social and political chaos was due to the fact that the nation was divided into competing regional states. He stated that the only solution to this situation was the development of a strong centralized government. A philosophically strong ruler supported by a Confucian bureaucracy would bring the peace and prosperity the Chinese nation so desperately needed. This would be a government based upon the development of personal morality. Later military theorists used this Confucian system to develop their doctrines, believing that the most important factor in preparation for war is the stability of one's own nation. The emperor must be a virtuous ruler whose actions have created a harmonious state. Before an emperor goes to war, he must have both the loyalty of his people and the "Mandate of Heaven" behind him.

The fifth century B.C.E. philosopher Mozi (Motzu) challenged Confucianism with his Mohist philosophy of universal love, which rejected all offensive war as immoral. To attack one's neighbor would be in violation of this most basic principle, causing the ruler to lose the Mandate of Heaven. According to Mozi, the only justifiable war is a defensive one, conducted to protect the population.

These two opposing philosophical schools would have the deepest impact on the evolution of Chinese military doctrine. The Confucian emphasis on the de-

velopment of a strong personal ethical code would always be in conflict with the aggressive nature of the martial arts. This would be the basis for placing the military under the control of the gentry-dominated bureaucracy. The Mohist stand against offensive war would lead to the development of a "Grand Defensive Strategy" that would greatly influence the development of training, tactics, and weaponry.

The philosophical foundation for tactical operations can be found in the writings of the Daoist military philosopher Sunzi (Sun Tzu; fl. c. fifth century B.C.E.). In keeping with the philosophical premise that the laws of nature were the ultimate reality, Sunzi developed a tactical doctrine that synthesized Confucian, Mohist, and Daoist beliefs. Sunzi, incorporating the Daoist concept of natural order, wrote that war is governed by five eternal elements. The correct application of all five by the military commander was necessary in order to carry out a successful campaign. Every military commander had to develop a plan of action that would take into consideration the moral law, weather, geography, the commander and his rules, and finally the military organization he was commanding. The success or failure of any military campaign depended upon all five of these factors operating in harmony with one another.

Finally the implementation of these theories under battlefield conditions was influenced by the philosophy of Legalism, which emphasized order and strength. Every successful leader, before he engaged the enemy, had to be assured that his orders would be executed without question and that his forces were always operating from a position of superior strength.

Medieval Sources

The vast majority of Chinese sources have yet to be translated into English, although some have been translated into French, German, and Russian. The most important medieval sources are three military manuals that were used by the Tang, Song, and Ming Dynasties. The earliest of these is Li Quan's (Li Ch'üan; fl. 759), *Shen chi chih ti T'ai-pai yin ching*, a manual that was utilized by the armies of the Tang Dynasty. The most respected source is the *Wujing* (*Wu-ching*), or "Five Classics," a collection of treatises written during the Song Dynasty giving detailed accounts of medieval Chinese military strategy.

Sunzi, the military theorist who wrote *Bingfa* (c. 510 B.C.E.; *The Art of War*, 1910), was active in military affairs during the Zhou (Chou) Dynasty and had a profound influence on later Asian military thought. He was largely unknown in the West until the eighteenth century and received widespread appreciation only in the twentieth.

The primary chronicle of the Yuan Dynasty is the *Yuan Shih* (1370), originally composed in ten volumes by Song Lian and Wang Wei, and revised and rewritten in 1934 by Ke Shaobin in 257 volumes as *Xin Yuanshi*. It contains not only the history of the conquests and the military in general but also includes biographies of most of the commanders throughout the Mongol Empire.

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Richard D. Fitzgerald

Japan
Medieval
Dates: c. 600-1600 C.E.

Political Considerations

Two outstanding political institutions dominate most of Japanese history until 1867: the samurai warrior class and the shogun military dictators. It is not exactly clear when the first Japanese state appeared, but Chinese and Korean chronicles speak of a recognizable kingdom at least by the fourth century C.E. In the fifth and six centuries, powerful families and clans residing in the area of present-day Kyoto and Osaka became united into the Yamato Court, the first real political entity in Japanese history. These hereditary clans, known as *uji*, controlled the majority of the population: the peasants, or *be*, who were grouped in caste-like fashion by occupation, residence, and family.

The *uji-be* system was modified in 645, but a characteristic feature of Japanese government at this time was the use of outpost soldiers, or *sakimori*, who guarded the borders. Sakimori protected strategic locations, such as outlying islands in the south and mountain passes in the north. An incipient standing army, these frontier guards were also sent on expeditions of various kinds, such as fighting the indigenous Ainu people in the northern territories. Although troops were initially provided by only the most powerful clans, by the eighth century each provincial governor was expected to provide a certain number (sometimes up to one-third of the male population aged sixteen to fifty-nine) of peasant-soldiers for three-year commitments. This policy was intended to break up the monopoly on military power held by the influential families.

However, the government, unable to control the activities of the remnants of the local uji clans in certain distant provinces, sent officials to these areas to oversee its interests and supervise the local administrations. The government also began granting land and tax exceptions to loyal subjects and to the younger sons and relatives of the court who, under the system of primogeniture, would not inherit their family's wealth.

A two-year smallpox epidemic beginning in 735 decimated the country, killing at least a quarter of the population and causing a severe labor shortage. As a result the government was economically unable to provide for a standing army, and landowners and aristocrats—as well as the officials previously sent by the government—began recruiting kinsmen to form bands of warriors to guard their own estates. Eventually, these blood ties lessened, but the permanent use of groups of such soldiers, called "samurai," or "those who serve," became a common way for landowners to protect and expand their holdings. The

Turning Points

c. 750	Carbon-steel swords first appear in Japan.
1192	The samurai Minamoto Yoritomo establishes the first shogunate at Kamakura, bringing order to Japan after four centuries of feudal chaos and political vacuum.
1477-1601	Perpetual civil war is waged throughout the Sengoku, or "Warring States," period.
1543	Firearms are first used in Japan.
1575	Three thousand musketeers help General Oda Nobunaga win control of central Japan.
1600	After the Battle of Sekigahara, Japan is unified as Tokugawa Ieyasu establishes the Tokugawa shogunate, with its capital at Edo (present-day Tokyo).

relationship between these noble warlords, eventually termed "daimyo," or "great names," and their vassals became one of intense loyalty. The samurai themselves grew into a class of military elite, with leaders drawn from descendants from the imperial family.

Although it was nominally a monarchy, medieval Japan actually was not ruled by the reigning emperor. Since the mid-700's, true power had lain in the hands of the shogun, a military dictator who theoretically protected the emperor from revolutionaries or barbarous indigenous border tribes. Although emperors inherited their titles, shoguns were ambitious leaders who rose to power on the basis of individual military skill and political guile. These shogun warrior governments ruled Japan until the mid-nineteenth century.

Under the shogunate system, power was divided between court and regent, allowing social or political instability as each disputed matters of jurisdiction. Because the shogun ostensibly governed on behalf of the emperor, his control was never absolute. Often disgruntled daimyo warlords would have their own ambitions and might rebel. Some samurai were never even vassals of the shogunate to begin with and were reluctant to obey its commands. Occasionally emperors themselves would try to assert direct authority and start revolutions of their own. Of course, too, there were many disputes over shogunal succession, both from within the ruling families and from outsiders.

MILITARY ACHIEVEMENT

Much of Japanese history centers on the struggles of the various shogunates and the resulting countrywide conflicts. Civil war was rampant, brutal, and endemic.

The Sengoku, or Warring States, period was a particularly cruel time. Perpetual fighting went on for more than a century, from 1477 to 1601. By the 1580's two generals, Oda Nobunaga (1534-1582) and Toyotomi Hideyoshi (1537-1598), had succeeded in unifying Japan after fighting numerous battles against various clans and eliminating the last Ashikaga shogun, Yoshiaki (1537-1597). After the assassination of Nobunaga by one of his own generals and the death of Hideyoshi, the country again fell into civil war. Tokugawa Ieyasu (1543-1616), Hideyoshi's successor, defeated a coalition of generals and warlords at the Battle of Sekigahara in 1600.

The Battle of Sekigahara is considered the most important Japanese battle in premodern times, ending the almost constant warfare that had preceded it and finally uniting the country. Ieyasu moved the Japanese capital to present-day Tokyo and established a reign of peace that lasted some 250 years. During this time of peace, the samurai evolved from warriors to government bureaucrats, administrators, scholars, and intellectuals. Though still an armed elite, the samurai warrior caste had, after a thousand years of struggle, finally been tamed in probably the greatest military achievement in Japanese history.

WEAPONS, UNIFORMS, AND ARMOR

SWORDS

The most famous Japanese weapon of this time is undoubtedly the Japanese sword, which had been made in the islands since the eighth century. More than two hundred schools of sword making could be found, each with its own distinctive style and characteristics. By the tenth century Japanese swords were considered the best in the world, a distinction that lasted until an 1868 imperial edict limiting their production.

Swords came in a number of sizes, weights, and lengths. During the Muromachi period of government (1338-1573), it became common for samurai to carry matching pairs of swords: a long *katana* sword with a blade about 2 feet in length and a short *wakizashi* sword with a blade about 16 to 20 inches in length. Only samurai were allowed to wear swords, tucked into sashes around the waist, in noncombat situations.

SPEARS

Although regular foot soldiers would often carry swords, usually of inferior quality, their primary weapon was the long spear. Spears of every possible

length and weight could be found, but one popular type of spear was the *naginata*: a curved steel blade placed on a polished wood staff of about 5 or 6 feet in length. The naginata was particularly effective against mounted attacks. The straight *yari* was the most common type of spear, with a double-edged hardened steel blade placed at the tip.

BOWS AND ARROWS

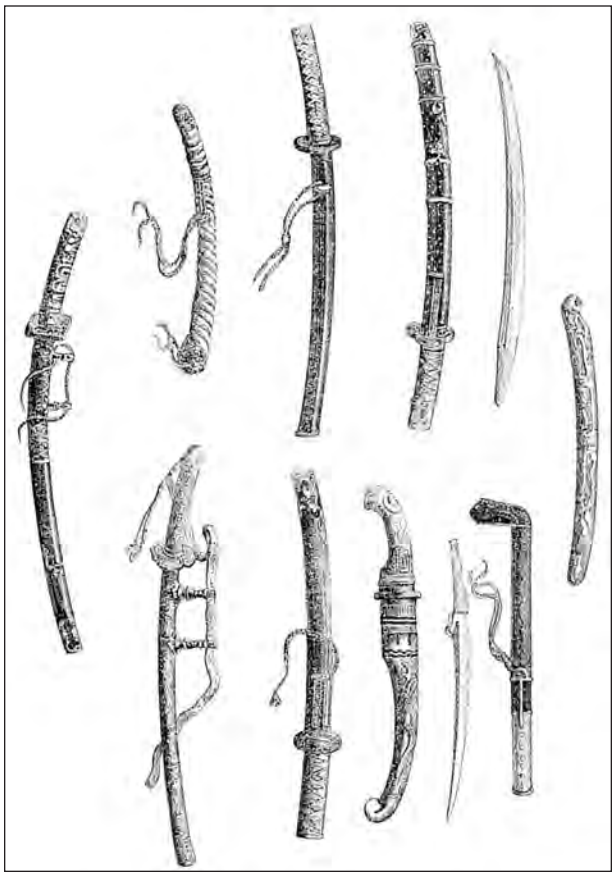
Japan has always been famous for the art of archery, and for centuries the bow and arrow was the primary military weapon. Mounted archery was a favorite sport of the early imperial court, and troops of mounted archers played an important role in repelling the thirteenth century Mongol invasion led by Kublai Khan (1215-1294). Arrows were made of fine points of steel, and the layered bows were especially powerful. By the fifteenth and sixteenth centuries, units of foot soldiers would advance while firing their arrows in alternating rows. Although it was not especially accurate, this steady stream of arrows flying at the enemy often forced defenders to break ranks.

ARMOR

Although armor was used in Japan as early as 400, it was not until the ninth century that the distinctively Japanese style of armor known as *yoroi* first appeared. This style remained basically unchanged until the modernization of Japan in the mid-nineteenth century. Medieval Japanese armor was some of the most intricate and beautiful in the world. Squares of metal were laced together with leather straps, allowing for a great range of motion. This supple armor gave mounted archers and swordsmen the flexibility needed to ride and fight and also afforded foot soldiers solid protection against piercing lunges or deflected blows. Japanese iron helmets were works of art unto themselves, displaying everything from antler horns to flags to demon faces.

UNIFORMS

Uniforms were not standardized in Japan until the late sixteenth century. Each warlord or clan had its own distinctive crest or coat of arms. Individual samurai, too, were quite idiosyncratic in their choice of dress. By the mid-sixteenth century, battles had become colorful. Samurai wore small flags, or *sashimono*, on the backs of their armor to indicate their affiliations, and the foot soldiers and conscripts of a particular daimyo began to wear similar kinds of dress.



North Wind Picture Archives via AP Images

A collection of Japanese swords, which, from the tenth to the nineteenth century, were considered the best in the world.

MILITARY ORGANIZATION

Even as late as the Battle of Sekigahara in 1600 the Japanese system of military organization differed from the regimental models found in Europe. The main operational unit was the individual daimyo's army. Forces were placed in the field according to

North Wind Picture Archives via AP Images

A group of samurai warriors, a class that served as Japan's military elite throughout the medieval period.

family or warlord, and orders were given to each unit's individual leader, often without close coordination with the other field units. This lack of organized communication often caused severe logistical problems.

Unit specialization in the Japanese army was not particularly pronounced. Japanese armies generally consisted of foot soldiers and archers. Japanese horses tended to be small, making Japanese mounted attacks less effective than those of the European knights. Samurai often rode to battle but dismounted to fight; organized cavalry units, then, were not especially popular. Artillery units were also unusual. After Japanese daimyo learned that stone castles were necessary to withstand cannon attacks, all wood castles quickly disappeared. Japanese gunsmiths never really designed siege guns to destroy castle walls. Thus, individual artillery units were also rare.

DOCTRINE, STRATEGY, AND TACTICS

The famous battles of the Gempei Wars (1180-1185) and the Japanese Civil Wars (1331-1392) established the strategies and tactics of Japanese warfare that would last for more than two hundred years. Typical military formations employed samurai armed with swords or bows and arrows, peasant foot soldiers armed with pikes, and the occasional mounted samurai cavalry charge. It has been said by some military historians that these battles, for the most part, were little more than mass confusion. Although elaborate and colorful formations were often staged before the battle, no strict patterns were followed in fighting. Struggles often degenerated into numerous one-on-one fights pitting individual soldiers against one another, each man simply trying to stay alive and attempting to decapitate the nearest foe.

This form of battle owed much to the samurai ethos of personal bravery and honor. For example, Daidoji Yuzan (1639-1730), in his book *Budo shoshinshu*, translated as *The Code of the Samurai*, recommended that a true warrior "never neglects the offensive spirit" and that he should follow the proverb "When you leave your gate, act as though the enemy was in sight." According to the way of the samurai, the public demonstration of one's personal individual honor on the battlefield was more important than large-scale military or geographic objectives. In fact, some samurai even discouraged the study of military

strategy altogether. In another famous treatise on the samurai way of life, the *Hagakure*, which translates literally as "in the shadows of leaves," and is often known as *The Way of the Samurai*, Yamamoto Tsunetomo (1659-1719) argues that "Learning such things as military tactics is useless. If one does not strike out by simply closing his eyes and rushing into the enemy, even if it is only one step, he will be of no use." Indeed, it could be argued from the perspective of a millennium's distance that these individual private battles were as much the real reason for fighting as anything else.

Japanese warfare before 1570, then, was a highly unstructured affair; troops underwent little training and few drills. Samurai leaders, too, paid little attention to a campaign's supposed military goals. In the mid-sixteenth century, however, all this changed. A century of protracted civil war had altered the political climate and power dynamics in Japan. The central government and the shogunate were now vastly weakened, and the daimyo sought to enlarge their individual domains by force of arms. War came to be defined as warlord against warlord, clan against clan. To maintain this constant state of siege and countersiege, larger armies were needed. As there were not enough samurai (never more than 5 or 10 percent of the population), more and more peasant troops had to be used. These *ashigaru*, or foot soldiers, made up increasing portions of each of the daimyo's forces.

By the 1580's Nobunaga had realized the need for major changes, and his initial successes were due at least in part to his new ways of military thinking. Previously, a general in command of a smaller army had been able personally to inspire his troops with his own charisma, persuasion, and bravery. Now, with 20,000- to 50,000-man armies often commonplace, a leader's method of training, tactics, and command control were as important as his swordsmanship. Nobunaga, for example, realized the importance of uniforms and unit insignias for his troops, both to make identification during battle easier and to instill a sense of unit cohesion and identity.

Another major sixteenth century development was the introduction of firearms in 1543. The first guns brought to the country were Portuguese harquebuses, matchlocks, and muskets. Japanese daimyo immediately ordered their swordsmiths to start making copies. Within a few decades Japanese gunsmiths, working with high-quality Japanese copper, were some of the best in the world. Firearms became relatively inexpensive to produce and reliable to use. As early as 1549 Nobunaga bought five hundred matchlocks from a local daimyo and established the first musket brigade in a Japanese army. By the 1570's more than a third of all daimyos' armies had muskets, which became the most important weapon in the Japanese arsenal.

These new weapons forced major changes in tactics, as Nobunaga was quick to realize. Nobunaga pioneered the use of harquebus volley fire as a major

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Tokugawa Ieyasu defeated a coalition of generals and warlords at the Battle of Sekigahara in 1600, unifying Japan.

offensive tool, and others followed suit. In response to the adoption of firearms, the infantry was reformed into structured formations and echelons, including second-line units held back as reserves, a notion not used effectively by the Europeans until the early seventeenth century. In skirmishes spearmen were placed to the rear and flanks of the infantry to protect against infiltrators, and musketeers guarded the infantry and spearmen from cavalry charges.

After a series of power struggles throughout the late sixteenth century, Ieyasu defeated a coalition of generals and warlords at the Battle of Sekigahara in 1600 and established peace in the land. At this point he issued an unprecedented series of decrees that would eventually remove firearms from the country. Gun manufacturing first was restricted to one location and eventually was abolished altogether. The decision to eliminate firearms had several possible motivations. First, there was a generally negative feeling at this time toward all things Western, including guns. Second, according to samurai ethics, it was considered cowardly to kill someone from a great distance without meeting him face-to-face on the battlefield. Third, swords and the art of their use held special symbolic and aesthetic meaning in the minds of the samurai, who apparently felt almost naked without them. Finally and most simply, the country did not seem to need firearms. After stabilization by the Tokugawa family, Japan effectively cut itself off from the rest of the world for the next two and one-half centuries. Ironically, it was American gunboats in the 1850's that reopened the door.

MEDIEVAL SOURCES

There are many surviving documents, books, images, and artifacts from medieval Japanese times that tell a great deal about the lives of the samurai, daimyo, shoguns, and emperors. For example, illustrated training manuals of the era include guides to musket marksmanship, fencing, hand-to-hand combat, and even ninja assassination techniques. Also, the extensive writings of individual warriors tell much about their personal lives and philosophies. For instance, the loneliness of the sakimori frontier guards is reflected in the *Man'yō-shū*, an anthology of sakimori poems collected around 800 C.E. and translated into English as *Collection of Ten Thousand Leaves* in 1967 by H. H. Fonda. The famous *Gorin no sho* (c. 1643; *The Book of Five Rings*, 1974), written by master swordsman and artist Miyamoto Mushashi (1584-1645), is still read for its timeless insights on the philosophy of martial arts. The intrigues of the court and the shoguns are documented in the genre of war tales writings, the most famous of which is the *Heike monogatari* (c. 1240; *The Tale of Heike*, 1988). This collection of traditional tales of the five-year Gempei Wars (1180-1185) is probably the best existing expression of the samurai code of bushidō, the virtue of martial loyalty.

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James Stanlaw

The Mongols

Dates: c. 600-1450 C.E.

Political Considerations

Numerous steppe nomad empires existed in Eurasia throughout the medieval period. Prior to 1200 the Mongols had been merely one of many tribes in the steppes of Mongolia. Mongolia had long been a training ground for the horse archers that formed the cores of steppe nomad armies. Between 600 and 1206 C.E. several empires rose in Mongolia. The first was the early Turkic T'u-chüeh Empire of the early 600's. The Uighurs, who formed an empire from 744 to 840, were driven south by the Kirghiz of the Yenisei River, who held Mongolia until 920, when the Khitans established an empire over part of Mongolia and northern China that lasted until 1125.

Most of the information concerning these empires indicates that their armies consisted primarily not of infantry but of horse archers who relied on mobility and barrages of arrows to defeat their enemies, rather than on the shock tactics of European cavalry. Indeed, the most difficult battles for the nomads usually were those fought against other armies of horse archers, and not those fought against their sedentary opponents in China, central Asia, Europe, or Iran. Despite the long existence of these armies, it was not until the establishment of the Khitan Empire, also known as the Liao Dynasty (907-1125) of China, in southern Mongolia and northern China, that a true standardized military organization took cohesive form. After the fall of the Liao, the nomads of Mongolia still maintained their military predominance, yet not until the ascendance of Genghis Khan (who lived from between 1155 and 1162 to 1227) did they become the premier military power of the medieval period.

Genghis Khan drew upon the military formations of the Khitans and the Jürcheds (1115-1234), a Manchurian people who defeated the Khitans, as well as nomadic traditions and technology from the lands he conquered, to create an army that surpassed contemporary foes not only in fighting ability but also in strategy, tactics, and organization. The innovations he introduced continued throughout the Mongol Empire and were adopted by later leaders such as the Turkish conqueror Tamerlane (1336-1405), whose talents for military and administrative leadership allowed him to become the first central Asian leader to overthrow the Mongols. Although modifications of Mongol formations and equipment continued throughout the period following the Mongol Empire, it was not until the late fifteenth century that sedentary armies could match the achievements of the steppe nomads.

Military Achievement

The Mongols' military achievements were impressive: The Mongols built, through mobility, superior discipline, and advanced strategies, the largest contiguous land empire of its time. Although the empire remained unified for roughly only seventy years after the death of Genghis Khan, its heritage was maintained by his successors, who included his grandson, Kublai Khan (1215-1294), and later successors such as Tamerlane.

Perhaps the most difficult achievement for Genghis Khan was the unification of the tribes of Mongolia. Once these tribes were united, Genghis Khan forged them into an army of unprecedented size and force. Although tribal confederations had appeared throughout history, none of them possessed the martial potency, discipline, and organization of the Mongols. Furthermore, the Mongols quickly learned to adapt those military methods of their opponents that they deemed effective, particularly siege warfare and the mobilization of resources.

The Mongol Empire at its height stretched from

the Pacific Ocean to the Carpathian Mountains. Its armies ranged even farther, invading Vietnam and reaching the Adriatic Sea in Europe. In the early 1220's Jebe (fl. 1200-1230) and Sabutai (c. 1172-1245), two of Genghis Khan's top commanders, led roughly twenty thousand men into modern Iran, across the Caucasus Mountains into the Russian steppe, and back to Kazakhstan without the benefit of modern communication systems or even maps. This feat is even more impressive considering that the troops fought numerous battles along the way without reinforcements. The organization of the Mongol military allowed the empire to wage offensive wars on several fronts, from China to the Middle East. Although the empire gradually expanded over decades across Asia, individual invasions were rapid and fierce.

Turning Points

553	The eastern T'u-chüeh Empire is founded in Mongolia.
c. 740-840	Uighurs destroy T'u-chüeh Empire and dominate Mongolia.
840-920	Kirghiz invade Mongolia and drive out the Uighurs, continuing to dominate the region.
920	Khitans drive out the Kirghiz and establish an empire in Mongolia and China.
1125	Jürcheds conquer northern China and drive out the Khitans, and Mongolia descends into tribal warfare.
1206	Genghis Khan is named ruler of the Mongols.
1213	Mongols invade China.
1236-1242	Mongols make conquests in Russia, Eastern Europe, Iran, and Transcaucasia.
1258	Mongols capture Baghdad and end the ʿAbbasid Caliphate.
1260	Mongols invade Syria and capture Damascus but are defeated by Mamlūks at Ain Jalut.
1261	A civil war between the Il-Khanate of Persia and the Golden Horde of Russia begins.
1272	Kublai Khan establishes the Yuan Dynasty.
1335	The Il-Khanate of Persia ends.
1368	The Yuan Dynasty ends in China, and Mongols are driven back to Mongolia, where a period of civil war ensues.
1369	Tamerlane becomes ruler of central Asia.

Successors such as Tamerlane carried on the Mongol tradition. His campaigns consisted of continuous marching, from India into Siberia and the Middle East. Tamerlane was victorious over many of the top commanders of the late medieval era, including the Ottoman sultan Bayezid (c. 1360-1403), who struck fear into Europe, as well as Toqtamish (fl. c. 1380-1390), who had reunified the Golden Horde, a tribe of Mongols that sacked and burned Moscow in 1382.

Weapons, Uniforms, and Armor

The average Mongol soldier's primary weapon was a composite bow. This multilayered bow was small enough to be used on horseback but possessed a range equal to, if not better than, that of the English longbow. Each Mongol warrior carried two or three such bows, often in a quiver attached to the saddle of his horse. For ammunition, each soldier carried approximately sixty arrows in multiple quivers, also often attached to the saddle. The arrows were divided into three categories. The first included arrows that could pierce the heavy armor of European knights when fired from the 80- to 160-pound draw of the Mongol bow. Arrows in the second class were lighter and had a greater range but little penetrating power. Arrows in the third group were signal, or whistling, arrows, which were used to communicate within armies as well as to frighten enemies. The Mongols possessed a variety of other arrowheads for specialized purposes.

The Mongols also carried other weapons, such as sabers and axes, and often short lances, more often used for flying banners than in battle. However, these lances also possessed a hook forged into the blade, which enabled the Mongols to ensnare and then to pull more heavily armored foes off their mounts.

The single most important weapon or piece of equipment used by the Mongols and other steppe nomads was the horse. The Mongol horse was small,

roughly the size of a pony, yet durable, with incredible stamina. Each warrior possessed a string of horses, ranging from three to six, although some records report higher figures. The large number of horses allowed the warrior to remain mounted for the entire campaign; if one horse was killed, he had a replacement. More important, this arrangement allowed the Mongols to maintain their superior mobility: As one horse tired, a warrior could switch to another.

For the most part, Mongol warriors were unencumbered by heavy armor. They wore little armor, apart from hardened leather, or leather reinforced with lamellar plates, considerably lighter than even the finest chain mail. Chain mail was worn occasionally, but because the art of Mongol warfare depended on mobility, the extra weight of the mail was considered a hindrance. Heavy cavalry units armored their horses with lamellar cuirasses, which covered the horses' upper bodies. In the Il-Khanate of Persia, a Mongol dynasty that ruled in Iran (1256-1353), the Mongols switched from a light cavalry to a heavier force that naturally required more armor.

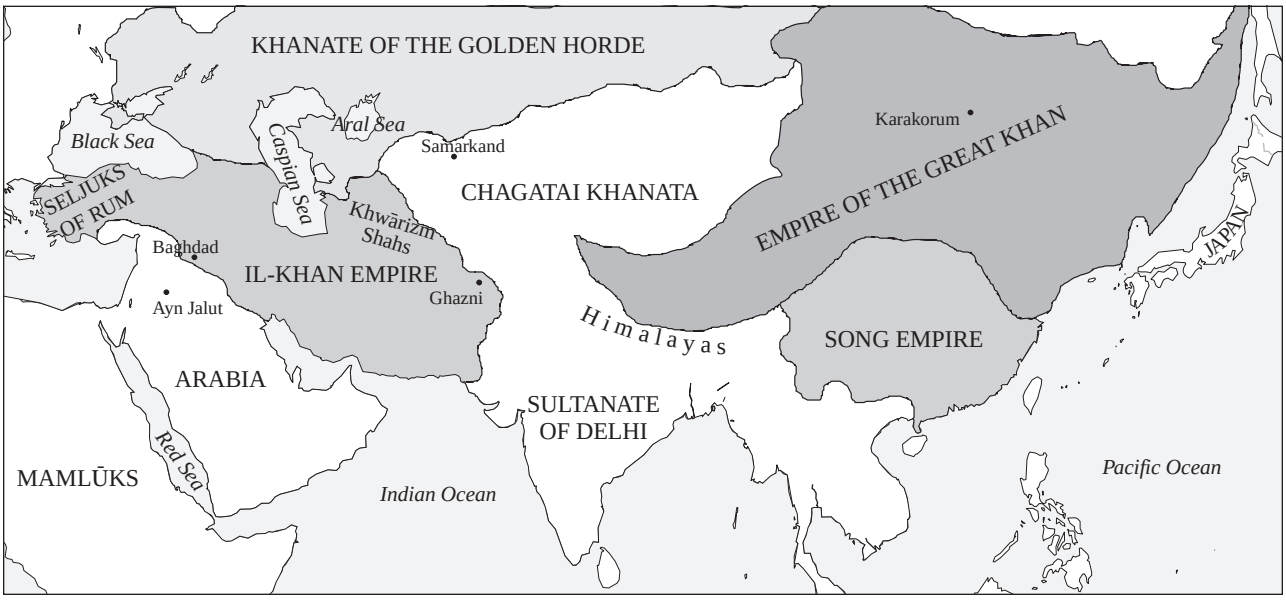
Although the Mongols did not have a specific uniform, they did cut their hair in a certain manner to identify themselves. Even those conscripted from the conquered would receive the Mongol coif, which consisted of a tonsure similar to that of a monk, with only a tuft of hair remaining in front and two braids trailing from the back.

MILITARY ORGANIZATION

The Mongols drew upon the Khitan military system to base the organization of their armies on the decimal system. The largest unit was the *tumen*, a division of ten thousand men. Contained within each tumen were ten *minggans*, or one-thousand-man units. These in turn were divided into ten *jaghuns*, or one-hundred-man units. The jaghun was the basic tactical unit. The smallest unit consisted of ten men and was known as the *arban*.

During larger campaigns, the Mongols often instituted a *tamna* force, in which a certain number of men from every unit, approximately two out of ten, were mustered to form an army. Once the campaign ended, these troops were allowed to return to their units. The conquered were also included in conscription, but they were usually required to serve in for-

THE MONGOL EMPIRE IN 1260



eign lands, in order to prevent rebellion. The most common method of preventing mutiny at a critical moment was simply to divide the new recruits into existing units. This arrangement prevented the new recruits from forming a cohesive and potentially disrupting force, and it helped to maintain the unit integrity of existing formations. Tamerlane, like Genghis Khan, divided members of recalcitrant tribes among various units in order to prevent mutiny.

DOCTRINE, STRATEGY, AND TACTICS

When the Mongols engaged an opponent's field army, they used a wide array of tactics to achieve victory. One such tactic, usually the opening one, was a barrage of arrows from a distance. Although this opening volley often inflicted little harm, it allowed the Mongols to see how the enemy would react. To remain in a position under constant fire probably became frustrating, especially for elite units. For massed infantry, often haphazardly armored, it became precarious.

From the Jürcheds, the Mongols adopted a troop composition of roughly 60 percent light cavalry and 40 percent medium-to-heavy cavalry. Army formations essentially consisted of five lines. The first three lines were light cavalry, and the last two were heavy cavalry. During battle the light cavalry released numerous barrages of arrows upon their opponents before retiring to regroup behind the heavy cavalry. After the opponent had become sufficiently disorganized, or after the Mongol commander decided to deliver the final blow, the heavy cavalry would trot forward in silence, accompanied only by the pounding of drums. Just before contact, the riders would release a terrific, collective scream, intended to frighten their opponents.

The key element in battle remained the Mongol barrage, or "storm," of arrows, after which the Mongols would base their ensuing actions on their observations of their enemy. They would opt either for an enveloping maneuver or for a continued arrow barrage, at a closer, more destructive range. Another tactic was the *mangutai*, or the so-called suicide attack. In this maneuver a select group of Mongols would harass the enemy lines, showering them with arrows at close range until the enemy finally broke ranks and charged. The Mongols would then flee, still firing their arrows by turning backward in their saddles, a technique known as the Parthian shot, perfected and made famous by Parthian warriors of ancient Persia. After the pursuing forces became strung out and disorganized, the majority of Mongol forces would then charge. Often these forces had been waiting in ambush along the flanks, or were in fact the mangutai troops, who had mounted fresh horses. The pursuing forces would be unable to withstand the cohesive force of the Mongol charge. This maneuver—the feigned rout—was an old steppe trick, one that the Mongols raised to perfection. In the encircling maneuver the Mongols often left a gap between their lines. Eventually, the encircled foe would detect the gap and attempt to escape through it, inevitably leading to a rout, during which the Mongols would pursue and cut down the fleeing soldiers.

The Mongols conducted the majority of their battles at a distance. They possessed a great advantage in the power of their bows and believed in the principle of massed firepower, coordinating their fire arcs through the use of banners, torches, and whistling arrows. Much like that of modern directed artillery fire, the effect of massed Mongol firepower could be devastating.

Mongol use of massed firepower also applied to sieges. At Aleppo in 1400, the Mongols arranged twenty catapults against one gate. The Mongol use of massed firepower—decades before the English use of massed longbow archers—reduced enemy armies, and with catapults and ballistae, demolished city defenses.

Other Mongol tactics included psychological maneuvers. The Mongols often lighted more campfires than normal to make their camps appear to be larger than they were. At times they also mounted dummies on their spare horses, so that their armies would appear from a distance to be larger than they were. Tamerlane contributed the trick of tying branches to the tails of his horses, so that enormous clouds of dust could be seen from a distance, deceiving his enemies. Merchants who served as spies spread rumors far in advance of the army. Furthermore, Mongols treated

North Wind Picture Archives via AP Images

Mongol warriors harass their enemies in battle.

with leniency cities that surrendered, whereas they crushed mercilessly those that opposed or rebelled.

In terms of strategy, the Mongols had a set method of invasion that varied only slightly from campaign to campaign. The Mongol army invaded in several, usually three, columns: a center force and two flanking corps. The flanking units, in some instances, went into neighboring territories before a rendezvous with the center army, as in the Mongol invasion of Hungary in 1241. Armies sent into Poland distracted the Poles, the Teutonic Knights, and the Bohemians from joining the Hungarians. A screen of scouts and outriders constantly relayed information back to the column. Their preplanned schedule and use of scouts allowed the Mongols to march divided, but to fight united. Furthermore, because their forces marched in considerably smaller concentrations, the Mongols were not impeded by columns stretching for miles. They used their mobility to spread terror on many fronts at the same time; their opponents were rarely prepared to concentrate their forces against them.

The Mongols' use of many-pronged invasions also fit in with their preferred method of engaging the enemy. The Mongols preferred to deal with all field armies before moving deep into enemy territory. Because the enemy usually sought to meet the Mongols before they destroyed an entire province, reaching this goal was rarely difficult. Furthermore, the Mongols' use of columns and a screen of scouts enabled the gathering of intelligence that usually allowed the Mongols to unite their forces before the enemy was cognizant of all the different invading forces, thus better concealing their troop strengths. This arrangement also meant that an embattled force could receive reinforcements or, in the advent of defeat, could be avenged.

By concentrating on the dispersion and movement of field armies, the Mongols delayed assault on enemy strongholds. Of course, the Mongols took smaller or more easily surprised fortresses as they encountered them. The destruction of the field armies also allowed the Mongols to pasture their horses and other livestock without the threat of raids. One of the best examples occurred during Genghis Khan's Khwārizm campaign (c. 1220). The Mongols took the surrounding smaller cities and fortresses before capturing the principal city of Samarqand, in modern Uzbekistan. This strategy had two effects. First, it cut off the principal city from communications with other cities that might provide aid. Second, refugees from these smaller cities fled to Samarqand, the last stronghold. The sight of this streaming horde of refugees, as well as their reports, reduced the morale of the inhabitants and garrison of the principal city and also strained its resources. Food and water reserves were taxed by the sudden influx of refugees. Soon, what once had seemed a formidable undertaking became an easy task.

After conquering the surrounding territory, the Mongols were free to lay siege to the principal city without interference of a field army. Smaller forts and cities could not harry the Mongols, who either foraged or pursued other missions during the siege. Most important, the many Mongol columns and raiding forces had prevented the main city from effectively assisting its smaller neighbors without leaving itself open to attack. Finally, the capture of the outer strongholds and towns provided the Mongols more siege experience as well as raw materials in the form of labor either to man the siege engines or to act as human shields for the Mongols.

The Mongols also strove to destroy any hopes their opponents had to rally by harrying enemy leaders until they dropped. Genghis Khan first did this during his unification of Mongolia. In his first few encounters, the enemy leaders had escaped, which continually haunted him. After this lesson, the Mongols habitually hunted down opposing leaders. In Khwārizm Sultan ʿAlā al-Din Muḥammad (r. 1200-1220) died alone on an island in the Caspian Sea after being hounded by Jebe and Sabutai. Mongol units relentlessly pursued Jalāl ad-Dīn Mingburnu (r. 1220-1231), Muḥammad's son. Béla IV (1206-1270), king of Hungary, barely escaped the Mongols, led by Batu Khan (died 1255), in 1241, as his boat pushed off of the Dalmatian coast into the Adriatic Sea.

Constantly on the move to avoid the Mongol forces, an enemy leader was unable to serve as a rallying point for his armies, who were also required to keep moving in order to find him. In many reports, the enemy leaders were only a few steps ahead of the Mongols. This strategy also allowed the Mongols opportunities to acquire new intelligence on other lands, because fleeing leaders ran in the opposite direction of the Mongols. The pursuing Mongol forces could then wreak havoc in new territories. Local powers would keep their forces at home, instead of sending them to help their overlords. In many instances the Mongols would defeat local armies they encountered along the way while avoiding the strongholds, another example of the Mongol method of destroying field armies before laying siege. The most important aspect of these pursuit columns was their capacity for destruction and intimidation, which created a buffer between the currently occupied territories and those that recently had been subdued. Thus, the main army could finish its mission of subjugation while the surrounding environs were devastated and rendered harmless.

MEDIEVAL SOURCES

Medieval sources of information about the Mongol military are fairly rich, due to the fact that the Mongols covered a large territory. Most accounts were written by the conquered, or by individuals hostile to the Mongols. The one surviving Mongol source, *The Secret History of the Mongols* (c. 1240), is extremely important for the study of the Mongol military. It is the primary source for the unification of Mongolia under Genghis Khan, revealing his initial defeats and the lessons he learned from them. It also describes the organization and tactics of the Mongol army.

Finally, this work also provides the best description of the *keshik*, or the bodyguard of Khan. The keshik also served as a training school for officers.

The *Jāmi ʻat-tawārīkh* by Persian physician, historian, and politician Rashīd ad-Dīn (1247-1318), and the *Tārikh-i jehān-gushā* (1252-1256; *A History of the World Conqueror*, 1958) by ʿAṭā Malek Joveynī, also known as ʿAṭā Malek Juwaynī, are among the most important Muslim sources. Both authors were members of the civil government under the Mongols, and their works reveal much about Mongol conquests, organization, and strategies. Rashīd ad-Dīn's work also is the source of Maḥmūd Ghāzān's (1271-1304) reforms for the Il-Khanate's military. In addition, numerous Arab authors and later ones from the Mamluk period (1250-1517) discuss the Mongol invasions, as well as more minute details of strategy and tactics. Arab author Ibn al-Athīr (1160-1233), a historian and scholar of Mosul and Baghdad, wrote *al-Kāmil fī at-tārīkh*, whose title means "the complete history."

Among European sources, the travel accounts of French Franciscan friar and traveler Willem van Ruysbroeck (c. 1215-c. 1295) and missionary Giovanni da Pian del Carpini (c. 1180-1252) stand out. Both individuals traveled to the court of the Khans, a few years apart. Their accounts contain much anecdotal and incidental information and vary greatly in tone. Shortly after the Mongol invasion of Hungary Pope Innocent IV in 1246 sent del Carpini to the Mongols in an effort to determine the Mongols' intentions for the rest of Europe. Thus, del Carpini's account is that of a diplomat and a spy who is very concerned with the future of Christendom. Del Carpini notes the weapons and composition of the Mongols' armor and provides a lengthy treatise on how the Europeans should combat the Mongols. Had Europe heeded del Carpini's words, its military systems would have more closely resembled those of the Mongols. Del Carpini clearly recognized the inadequacies of the unruly masses of European knights and men-at-arms against the disciplined Mongol forces.

The vast majority of the Chinese sources have yet to be translated into English, although some have been translated into French, German, and Russian. The primary chronicle is the *Yuan Shih* (1370), originally composed in ten volumes by Song Lian and Wang Wei, and revised and rewritten in 1934 by Ke Shaobin in 257 volumes as *Xin Yuanshi*. It contains not only the history of the conquests and the military in general, but also biographies of most of the commanders throughout the Mongol Empire.

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Timothy May

India and South Asia
Medieval
Dates: c. 500-1526 C.E.

Political Considerations

India's long history, with the exception of Aśoka's (c. 302-c. 232 B.C.E.) Mauryan rule between 269 and 232 B.C.E., has been one of constant internal strife and defensive warfare. Early Hindu literature considered war and duplicity as serious activities, extolling them as honorable duties of king and subject alike. A warrior caste, the *kṣatriya*, was dedicated to warfare, and the concepts of glory and honor were punctuated in works such as the *Mahābhārata* (c. 400 B.C.E.-200 C.E.; *The Mahabharata*, 1834); the *Manusmṛti* (compiled 200 B.C.E.-200 C.E.; *The Laws of Manu*, 1886); and the *Arthaśāstra* (300 B.C.E.-300 C.E.; *Treatise on the Political Good*, 1961). Prior to the Mauryan Empire and Aśoka's rule, war had been brutal and merciless. After the second century B.C.E., however, war was fought in a more humane manner.

Around 500 C.E., with the appearance in India of numerous invaders from Central Asia, where armies and fighting techniques were superior, Hindu warfare underwent a profound modification. War elephants, concentrated use of cavalry, and emphasis upon horses were integrated with Indian techniques to give the highly mobile invaders a distinct advantage over rigid Indian methods. Horses, which had not flourished in India, were hearty, strong, and durable in battle. The invaders' concentration upon cavalry with superior horses increased their mobility. With their entrance into the Punjab and their operation around trade routes, the invaders opened a new era in Indian warfare. Hindu principalities, for the most part, continued to engage in petty intertribal disputes.

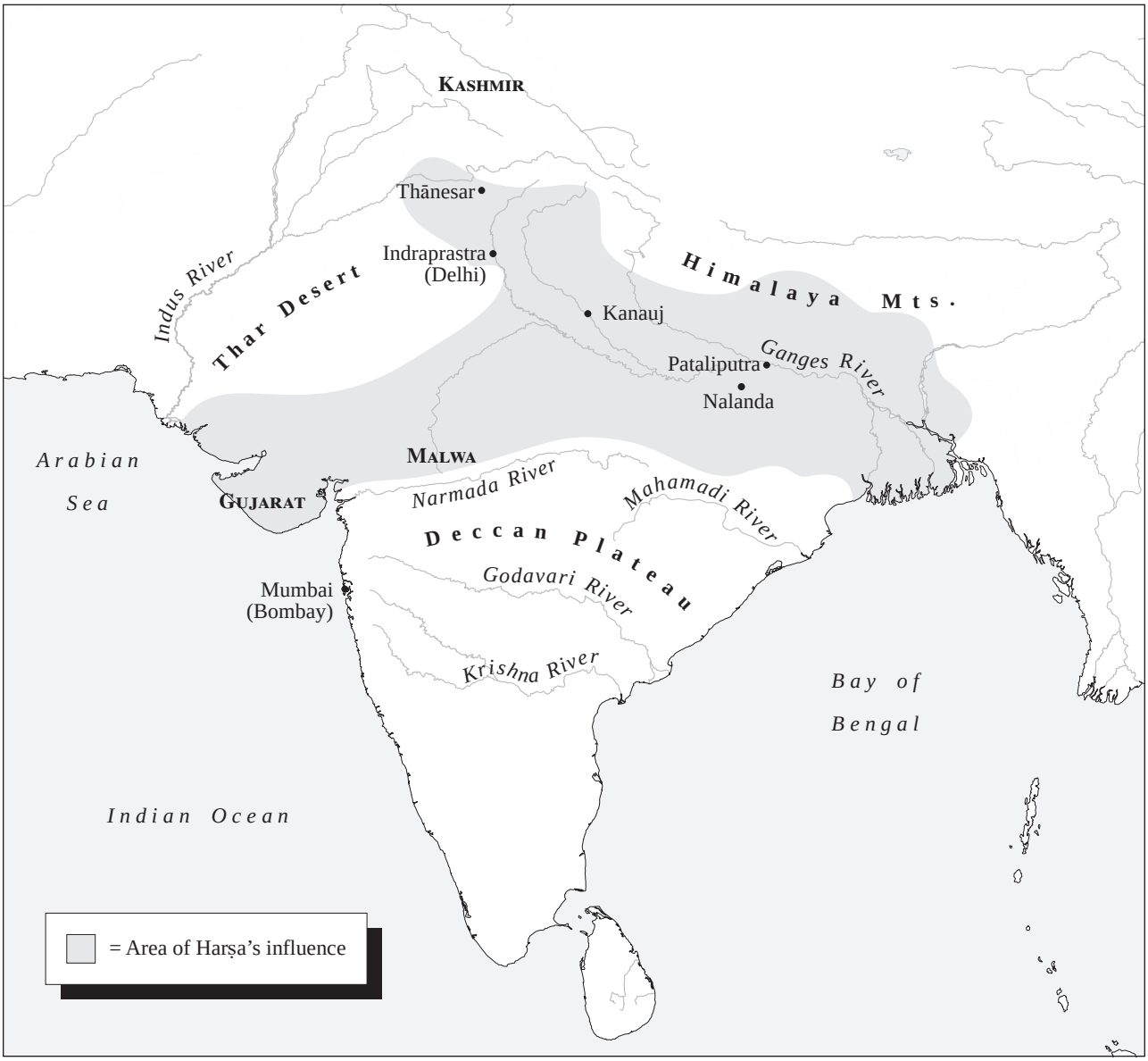
The one thousand years between 500 and 1526 C.E. witnessed four critical periods characterized by internecine warfare and destruction. The sixth century introduced numerous invading hordes that opened India to centuries of defensive warfare. Muslim influence in the tenth century, in the form of the Ghaznavid Turks from Afghanistan, began an early influx of Islamic and Muslim influence that continued almost uninterrupted into the early sixteenth century. The most traumatic period was the fourteenth century with the Mongol invasions of Tamerlane (1336-1405) in 1398, which left North India devastated. Two hundred years later, a turning point in Hindu history occurred with the invasions of Turkic armies out of Kabul, Afghanistan, under Bābur (1482-1530) and the founding of the first Mughal Empire of India.

Military Achievement

Petty squabbles and interprincipality rivalries for territorial control characterized the approximately one-thousand-year period from 500 to 1526 C.E. Attempts were made at creating unified empires, but these were short-lived. During the first half of the seventh century two figures emerged who vied for supremacy. North India was conquered by Harṣa (c. 590-c. 647) who, in attempting a southward expansion, was repulsed by Pulakeśin II (r. 609-642), the greatest of the Cālukyan monarchs. After the death of Harṣa, constant endemic warfare erupted between numerous rival dynasties and local kingdoms amid frequent foreign invasions by steppe nomad warriors and by Arabs whose militant religious zeal left an indelible mark on Indian history.

During the ninth century North India witnessed a fierce three-way struggle between three dynasties—the Prātihara of Rajputana, the Pāla of Bengal, and the Rāṣṭrakūṭa of the Deccan—that left general chaos

Harṣa's Empire, c. 640



and disunity in its wake well into the tenth century. On the periphery of India a new power flexed its muscle in the form of the Central Asian Turks. Their Muslim emirate of Ghaznī in Kabul, Afghanistan, exploited the anarchy of the subcontinent by raiding northern Punjab. In the early years of the eleventh century, Maḥmūd of Ghaznī (971-1030), one of the most able military leaders of Asiatic history, exerted such pressure with his raids that Hindu princes swore allegiance to him. He weakened the power of Hindu states in North India and removed the Prātihara Dynasty of Kanauj, the greatest obstacle to the spread of Islam. These raids ceased in 1030, and the Turks turned to gaining control of Persia and Central Asia. Maḥmūd's successful attacks were a precursor of events to come later in the twelfth century. The

TURNING POINTS

500	Central Asian invaders appear in India, bringing superior fighting techniques and concentrated use of cavalry.
10th cent.	Ghaznavid Turks invade India from Afghanistan, introducing an Islamic influence that will continue almost uninterrupted until the early sixteenth century.
1398	Mongol invasions by Tamerlane devastate North India.
1526	The Asian Turk Bābur defeats Delhi Sultan Ibrahīm Lodī at the Battle of Pānipāt and establishes the Mughal Empire.

Hindu rulers continued their wrangling using the same unwieldy military tactics, having learned nothing from their defeat at the hands of the Turks.

Muslim invasions continued during the twelfth century, led by Maḥmūd's successor, Muḥammad of Ghor (died 1206), who completed the conquest of North India. Meanwhile, interdynastic war between the Cōla, Cālukya, and Hoysala Dynasties raged for hegemony of South India, and Tamil invasions of Ceylon added to the area's struggles. With Muslim conquests and the spread of Islam, North India fell under the domination of a foreign power, a foreign religion, and a foreign language. The Muslim Sultanate of Delhi and its offshoot, the Slave Dynasty, dominated the Indian scene throughout the thirteenth century. Quttbuddin Aibak (died 1210), Shams al-Dīn Iltutmish (r. 1211-1236), and Ghiyās al-Dīn Balban (r. 1266-1287) extended the Sultanate, ruled with great ability, and attended to the safety of the empire, which was constantly threatened by various Mongol hordes on its borders. Periods of stability existed but were punctuated by anarchic dynastic changes, Hindu rebellions, and endemic civil war between Turkish nobility and the Mongol raiders of India.

In 1296 the ruthless monarch ʾAlāʾ al-Dīn Muḥammad Khaljī (r. 1296-1316) conquered the Deccan to unite most of India under one rule. By the end of the century, however, the empire collapsed in 1398 under the relentless onslaught of Mongol forces led by Tamerlane. For two hundred years North India lived in utter chaos under the Mongol onslaught, while South India collapsed under the conflicts waged between various Hindu and Hindu-Dravidian dynasties as well as the assault of ʾAlāʾ al-Dīn Muḥammad Khaljī.

The rise of the new Hindu kingdom of Vijayanagar continued warfare with the Muslim Sultanate of Bahmanī during a large part of the fourteenth century. The Muslims were victorious, but Vijayanagar remained independent. The Sinhalese of South Ceylon, meanwhile, waged war with the Hindu Kalingas of the north, against whom they were generally successful.

After Tamerlane's disastrous invasion, the central Gangetic Valley and south-central and southwestern India fell under the control of turbulent Muslim rulers. The Hindus took advantage of the situation and emerged as leading powers in eastern and western India, most notably in Orissa and Mewar. Intermittent warfare continued between the two powers until two great events of the sixteenth century ended the chaos of the fourteenth and fifteenth centuries and changed the course of Indian history. In 1498 Portuguese traders arrived on the Malabar Coast and exposed India for the first time to European ideas and influence. Simultaneously the Central Asian Turk Bābur succeeded in occupying Kabul in 1504. He took advantage of the chaotic political environment to invade India, defeat the Delhi Sultan Ibrāhīm Lodī (died 1526) and establish the first Mughal Empire of India in 1526. Such an empire had not been seen since the days of the Guptas.

The medieval period in South Asia was dominated by three outside forces that revealed the inherent weakness of the Hindus against less numerous but better trained and equipped mounted invaders. Turkic Muslims, Central Asian Mongols, and European Portuguese traders exerted an influence that forever altered the course of history in India, a history dominated by superior military skill and prowess.

WEAPONS, UNIFORMS, AND ARMOR

Before the time of written records, wars were waged between tribal units using clubs, spears, and knives to vindicate offenses. Rarely were wars waged to acquire territory or gain some economic advantage.

During the ancient period in India battles were close-formation skirmishes fought by the *kṣatriya* warrior caste utilizing thrusting and throwing instruments. During the medieval age, from 500 to 1500 C.E., battles were dominated by heavy cavalry. The primary weapon of choice was the bow and arrow. The growing reliance upon cavalry and archers was due to technological advancements in archery and the introduction of the saddle and stirrup between 300 and 800 C.E., which provided stability for the rider and support for his sword, spear, and lance.

Weapons during the medieval age were generally the same as those used in ancient warfare. These included quivers (*bhastrā*) slung from a shoulder, broad-bladed swords (*khadga*), heavy broadswords (*niṣṭrimśa*), spears (*śakti*), javelins (*śūla*), reverse-curved swords, ancient slings (*gophaṇa*), curved throwing sticks (*vālāri kāmbi*), and sharpened throwing discs (*jah*) thrown horizontally or dropped vertically upon attackers.

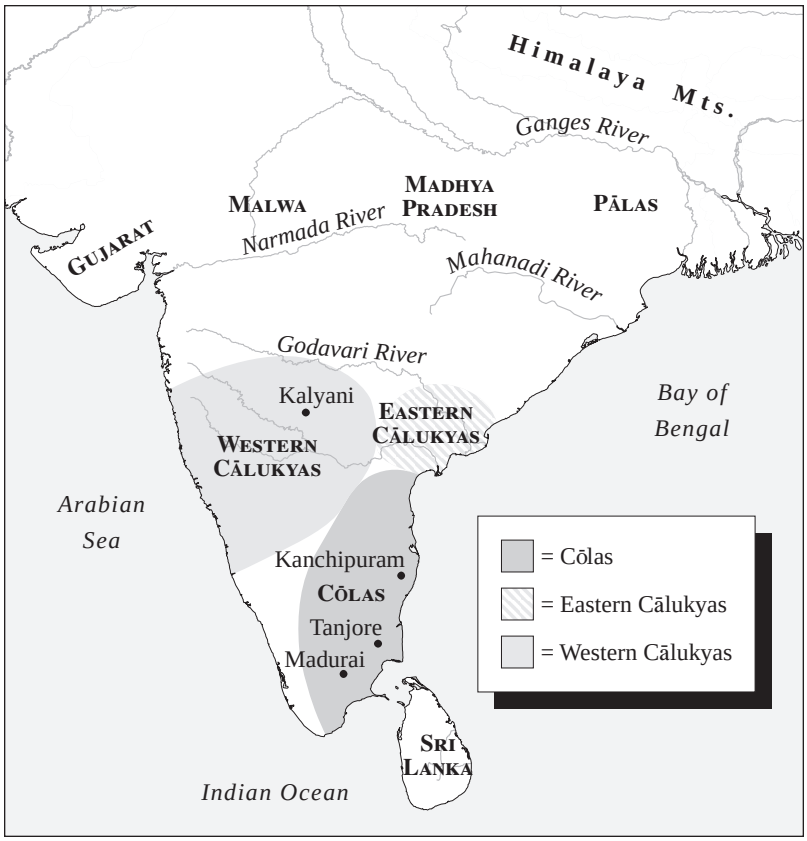
Head and body protection included shields of leather, the preferred material, scale or lamellar helmets, and a "coat of a thousand nails" scale-lined and fabric-covered or padded about the torso. Heavier lamellar armor of thin plates, common in premedieval times, was rarely worn, especially in the humid, tropical south. For climatic reasons soft cotton quilted armor was preferred, and its use eventually spread to the Middle East and even to Europe. Asbestos cloth appeared in an assortment of fireproof clothing by the twelfth century. Some protective armor for arms and legs was also used.

Horse harnesses were primitive at best. A leather toe-stirrup had been known in India since the first century B.C.E. and continued to be used well into the eighth century C.E. Horse armor seems rarely to have been used in Indian warfare.

Years of civil strife left Indian armies poorly equipped. The infantry, made up of peasants, farmers, Jats, Gujratis, and various robbers, used bamboo staffs and, at best, rusty swords. The bow and arrow, much relied upon as a primary weapon, could not pierce the armor worn by Central Asian Turkic forces. The Hindu rajas relied heavily on herds of war elephants to demoralize enemy ranks and disperse cavalry. Turkic forces, however, used steel-clad warriors mounted on superb, agile horses. These were kept in reserve in the center of battle, behind the front line of attack, and were used to decide the final outcome.

Hindus generally expended their energy pursuing Turkic horsemen who harassed them with firepower, counterattacked, and forced them into hopeless flight and slaughter. The Turkic nomadic invaders used a composite two-piece bow considered the most fearful weapon on the battlefield. Hindus possessed noth-

Cālukya and Cōla Dynasties, c. 1030

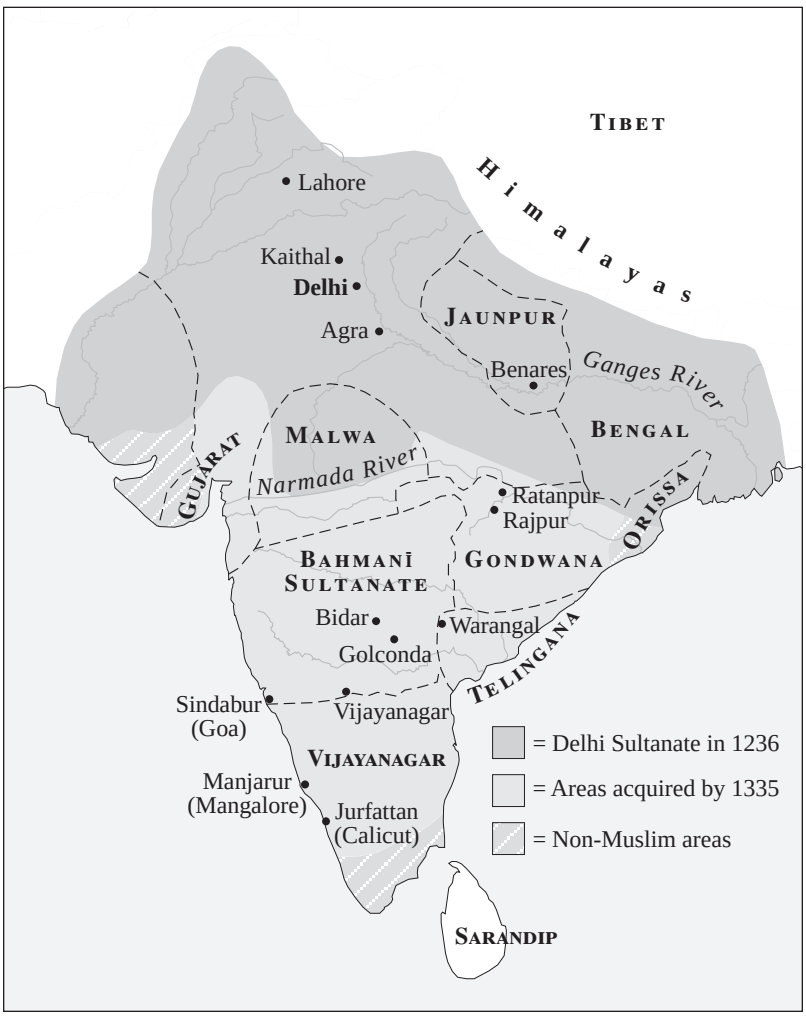


ing that matched the success of the composite bow. They used mounted bowmen as light troops to harass the enemy, whereas Turks used heavy armor-clad cavalry equipped with long spears in mass charges.

Military superiority gave the Turks the advantage over the Hindus. Turkish horses were superior in speed, endurance, intelligence, and dependability in hostile desert terrain. Turks used swift camels to carry provisions while living off the land, whereas Hindus used slow and burdensome pack-oxen. Thousands of years on the steppes and deserts of Asia had trained the Turks in stamina and strength.

The Muslim forces utilized various weapons developed by superior metallurgy around the tenth century C.E. Of these the curve-bladed steel scimitar proved supple, tough, sturdy, and capable of being honed to razor sharpness. Arab and Mongol forces possessed artillery against grenades, fireworks, and rockets of the Delhi Sultans. The arrival of Bābur's hardy, disciplined, and seasoned troops signaled the end of the disorderly and poorly equipped forces of the Sultans of Delhi. The introduction of muskets and artillery turned the tide against Hindu forces at the Battle of Pānīpat in 1526. Hindu rule in North India collapsed with the establishment of the first Mughal Empire of India, which lasted well into the nineteenth century. Gunpowder changed the course of warfare forever.

DELHI SULTANATE, 1236-1398



MILITARY ORGANIZATION

The organization of standing armies in India since the third century B.C.E. was based on an ideal extolled in classic religious texts. An army (*senā*) was commanded by a supreme commander (*senāpati*) over a four-tiered structure of infantry, cavalry, chariots, and elephants. Harṣha's army consisted of 50,000 infantry, 20,000 cavalry, and 5,000 elephants. Support services and noncombatants complemented this huge, unwieldy army. Chariots, mentioned in the seventh century C.E., represented a continuation of the ancient form of warfare. The senāpati used a four-horse chariot surrounded by a bodyguard and officers (*nāyaka*). The ancient military organizational system continued well into the fourteenth century, when cavalry gained greater importance in confronting Muslim invasions. However, traditional Hindu ideals of military organization remained.

In South India there was a clear militarization of the state into mili-

tary camps. The huge and effective fourteenth century Vijayanagar army was organized by a governmental department called the Kandāchāra and led by a *dandanāyaka*, or commander-in-chief. However, there was a notable absence of discipline among the military personnel.

Muslim invaders maintained a well-organized and effective army unlike anything they confronted in India. Muslim forces relied heavily upon superior leadership, seasoned troops of high quality, highly developed military science, and great metallurgical skill. Morale was of the highest nature, supported by a firm brotherhood and religious zeal that rationalized war and conquest in the name of religion. Primary goals were booty and destruction of heathen places of worship.

The backbones of the Delhi Sultan's army were cavalry and war elephants, the latter adopted from the Hindus. The effect of one elephant in battle was equal to that of 500 horsemen. Infantrymen were recruited slaves and individuals needing employment.

Bābur, descended from the Mongol leader Genghis Khan (between 1155 and 1162-1227), organized his Turkic army on that of Tamerlane (1336-1405). A first-rate military genius, Tamerlane had organized his fighting forces on a rational basis rather than one of ancient traditional practice, assuring him of unfailing success. He surrounded himself with loyal lieutenants whom he could safely trust with far-flung branch operations beyond his personal direction.

Muslim and Mongol organizational skills, complete mobility, and superior horses and weaponry overwhelmed Hindu forces governed by tradition and lack of discipline. Although Hindu rajas commanded close to one million men, lack of discipline made them vulnerable to highly structured outside forces.

Doctrine, Strategy, and Tactics

The *Arthaśāstra* remained the guide for military doctrine, strategy, and tactics well into the medieval period. After the Gupta monarch Skanda Gupta (r. c. 455-467) successfully repulsed the Ephthalite, or White Hun, invasion in 445 C.E., greater emphasis was placed on shock tactics and mobility of cavalry and archers. However, after Ephthalite leaders caused the collapse of the Gupta state early in the sixth century, Hindu armies again reverted to traditional use of inferior cavalry, war elephants, and less mobility in battle. Warriors continued to use quivers attached to the rear of a saddle. Chariot warfare declined, and shock-value use of war elephants increased. In the south, the Deccan army of the Vijayanagar kingdom used camel troops as mounted infantry. Certain troops long abandoned in most of Asia, such as slingers, were still maintained and used by Hindu rajas. Archers also remained a critical component of the army, guided by the *Dhanur Veda*,"science of archery," military manual.

Military tactics were heavily governed by the *Artharva Veda* (1500-1200 B.C.E.), one of the sacred writings of Hinduism. Archers shot from a kneeling position supported by spear, javelin, and shield-wielding infantry. Such immobility opened the army to ravaging attacks by extremely mobile Muslim and Mongol troops skilled in fighting on horseback. Elephants generally carried a driver, or *mahout*, and three to four warriors. In response, the use of large caltrops, iron-pointed triangular devices set in the ground to impede elephant and cavalry advances, was developed. Such Indian tactics were old-fashioned by the tenth century, but they continued into the thirteenth. Hindu pride prevented leaders from learning from their foreign adversaries. Hindus valued strength in numbers over speed and mobility, a doctrine that rapidly caused their defeat.

Pre-Islamic India was, however, well fortified, with walls built of stone, brick, or wood, and protected by slopes and bastions. Towers projected a short distance from the wall. Towns and villages of the seventh century had inner gates, wide walls of brick or tiles, and bamboo or wood towers. Six hundred years later the military architecture of Muslim and Hindu added the *chatri*, a ceremonial kiosk above the main gate to allow a monarch an observation post. Countersiege was highly developed, utilizing scaling ladders secured to mud-brick walls and iron plates to breach them. Elephants with iron plates on their foreheads were used as battering rams. A *pāshtīb*, or raised platform of sandbags, filled ditches between walls, and a *gargaj*, or movable wooden

tower, reigned down firepower upon the enemy. Attacks were impeded by use of fire, smoke, and heated iron grills.

Turk, Muslim, and Mongol strategy revolved around hit-and-run tactics, the defeat and humbling of a raja into vassalship, the utilization of his kingdom as a base for further advances into India, and the eventual annexation of the territory. The strategy of nibbling away at border provinces allowed a deeper penetration of the subcontinent. Success was directly dependent upon a well-established line of communications with Central Asia, which provided fresh reinforcements and supplies to accomplish deeper penetration. Together with social solidarity, a brotherhood of equality, lust for loot, and a fiery Islamic zeal against the infidel, the invaders quickly overcame Hindu resistance. Rapid movement necessitated a strong cavalry, which paralyzed Hindu armies with sharp decisive blows that frustrated their battle plans and evacuation.

Unlike Muslim solidarity, interclan and intercaste Hindu feuding and stress upon tradition in military affairs led directly to their final demise at the hands of Bābur's forces at the Battle of Pānipāt. Here Muslim firearms dominated the field of battle. The result was the complete collapse of Hindu resistance in 1526 C.E. and the formation of the first Mughal Empire in India.

MEDIEVAL SOURCES

The *Manusmṛti* (compiled 200 B.C.E.-200 C.E.; *The Laws of Manu*, 1886), which stressed glory and power, and the *Arthaśāstra* (300 B.C.E.-300 C.E.; *Treatise on the Political Good*, 1961), the primary treatise on Indian polity, laid the standards for war and peace well into the medieval period. The latter established principles of warfare, military organization, strategy, tactics, the role of king, military leaders, and warriors, as well as weaponry of war. In a theory of concentric circles, the core state was seen as surrounded by enemy states, and the aim of policy was to achieve a series of mutual alliances. Its emphasis was upon the reality of war rather than glory. The critical arm of the army, the archers, was governed and guided by the *Dhanur Veda*, written in approximately 500 C.E., an important manual on the science of archery.

Muslim military science and government of the thirteenth century was guided by the *Ādāb-ul-Mulūk wa-kifāyat al-mamlūk* (c. thirteenth century; translated in part in *Fresh Light on the Ghaznavids*, 1938), written by Fakhir-i Mudabbir (fl. twelfth-thirteenth centuries) for Sultan Shams al-Dīn Iltutmish. It covered governmental policies and served as a war manual, laying out guidelines for camping sites, battle formations, subterfuge, spying and scouting, night warfare, equipment and arms, and the care of man and horse alike.

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George Hoynacki

Southeast Asia

Dates: c. 500-1500 C.E.

Political Considerations

Although little is known about the early history of the Southeast Asian region and the origins of its peoples are unclear, the neighboring civilizations of both China and India had major influences upon Southeast Asian history. As a result of the permeation of Indian culture in the fifth century, the Indian warrior class and methods of waging war were adopted by the new Southeast Asian empires. The migration of the Guptas led to the founding of the Funan Empire. The Pallava wave was the impetus for the empires of Angkor (Cambodia) and Śrivijaya; and the Pāla Dynasty of Bengal profoundly influenced the Javan culture. The desire for aggressive imperial expansion was also subsequently embraced in Southeast Asia, and constant raids and sieges among Southeast Asian empires mark the early history of the region.

Some of the kingdoms of the region were controlling empires based on agriculture rather than foreign trade. Others were ports where trade with other states was of prime importance. Certainly Funan has its origins in trade, but the shift of the Khmer people toward Angkor shows a move either toward greater self-reliance or away from places that were also clearly vulnerable to foreign attack.

The main aim of rulers throughout the region was to maintain their dynasties. Much of the region was dominated by Hinduism, and the Hindu rulers of Angkor, and also the kingdoms in Java, wished to extend the boundaries of their lands by conquest. Gradually, with the advent of Buddhism, rulers began to see themselves as working in a compact with their people, with the goal of bettering the lives of their subjects. If this could be achieved through military aggression, then war would result. If, instead, it could be done by major building projects, those would take priority.

The gradual conversion to Islam in island Southeast Asia, the Malay states, and for the Champa kingdom, was accompanied, once again, by a rise in trade and also a period during which members of ruling families of one state would marry somebody from another, leading to a series of alliances and reducing the numbers of wars, although these still took place.

Military Achievement

The earliest information that exists on the warfare in the region comes from the small Indianized states on the Malay Peninsula, many of which were within the Funan Empire to the north, in the area of present-day Cambodia, and southern Vietnam. As the power of Funan faded, the Kingdom (or kingdoms) of Chenla arose. This was probably a federation of states that came together under a king at times of external invasion, but with constituent parts having much regional autonomy, a pattern that was followed elsewhere in the region at this time.

Militarily, this federal system was no match for unified states, and under Jayavarman II, the Kingdom of Angkor emerged in the 800's, taking over. A similar process took place in Champa (modern-day central Vietnam) and also later in modern-day Thailand. The first two were at this time Hindu monarchies, as were many of those in Java. In these societies, the rulers were warriors who served to represent the power of the state and defend its dignity against attack. Militarily they were successful at exerting their will over weaker neighbors, with clear evidence from surviving chronicles of many wars of aggression and also of depredations from their neighbors.

The growth and expansion of the Śrivijayan and Javanese Empires are strong examples of the common aggressive desire to expand, and the constant conflict between the two empires eventually led to the absorption of Śrivijaya within the dominion of the Majapahit kingdom, which controlled most of

Sumatra, the coastal regions of Borneo and Celebes, and the Lesser Sunda Islands.

By contrast, in mainland Southeast Asia, there was a balance of power for much of this period between the Burmans, Thais (or Tais), and the peoples from Angkor and Champa.

WEAPONS, UNIFORMS, AND ARMOR

The weapons used by most of the people in Southeast Asia in medieval times were Indian in style: bows, arrows, curved flat swords, broad short daggers, and long shields. In Śrivijaya, the unusual arrows had crescent-shaped heads, which could cut a head from a body or divide a bow in two. Battle scenes are depicted in many bas-reliefs in Java and Cambodia from the tenth century C.E. Although these images tell nothing of tactics, they are significant in revealing that only infantry took part in the melees, although chariots can be seen in subsequent victory processions. This was almost certainly an aspect of Javanese warfare; horses and elephants were mainly reserved for chiefs and high officers. Of note is the virtual absence of spears in Java, because only the strongest Indianization could have replaced this favorite local weapon with the bow. By contrast, in Angkor, the spear shared the primary place with the flat and curved sword. There were daggers, but no trace at this time of the kris, a typical Malay dagger invented around the fourteenth century. Shields varied in shape with most being oval or rectangular. Some soldiers were also depicted wearing a cuirass, protective armor covering the torso. Another local weapon, especially preferred by the jungle peoples, was the blowpipe, which probably fired some form of poisonous dart.

As a result of the Indian influence, elephants were used in battle and the King of Funan was reported as riding on an elephant as early as 245 C.E. Gradually more elephants were used in battle; one division of the army consisted of one hundred elephants, and a hundred men surrounded each elephant. In Cambodia, by the eleventh century, there was a sort of cage, called a *howdah*, on the back of the elephant. In it rode four men armed with bows, arrows, and lances. The elephant's tusks might also be sharpened or lengthened with sword blades, and it might pick up enemy soldiers with its trunk or trample them underfoot. The standard battlefield role of war elephants was in the assault, to break up the enemy ranks, but elephants were also used in sieges, to push over gates and palisades or to serve as living bridges.

After the formation of the Majapahit Dynasty, however, weapons and warfare underwent significant changes in island Southeast Asia. The military dress completely evolved from the Indian to the East Javanese fashion. Weapons, notably axes, clubs, swords, and daggers, seem to have been Indian in design, though the curved swords are of a later type than those on the Central Javanese reliefs. The reappearance of the spear in these reliefs, while the use of the bow is confined to human heroes, suggests an increasing pressure to resume use of local types of weapons. Both swords and daggers have definitively Indian-type hilts, and the kris seems still to be absent from use. The kris may not have become popular until the fifteenth century, when Majapahit krises appear to be represented on a relief of a Javanese forge.

A Javanese inscription of 1323 speaks of "magically forged weapons," indicative of the belief that magic and proper worship and sacrifice to the gods would bring victory on the battlefield. Much importance was placed on the art of procuring talismans, incantations, or drugs, the knowledge of which was the education of every hero. Another piece of evidence concerning the character of Majapahit warfare is the reproduction through drawings of a battle array, a crayfish-type military formation in which the forces were distributed in order in preparation for an attack. The Javanese often gave up any idea of preserving their own lives in battle and would rush the enemy, committing indiscriminate slaughter and refusing to surrender alive.

As well as fighting on land, the Khmers and the Chams also fought at sea. They used galleys to attack each other, and the Chinese also launched a seaborne invasion of Champa. This was notable because the Chinese introduced artillery to overcome the Cham elephant attacks. After the Chinese had landed, they directed all their arrow fire against the Cham elephants and subsequently obtained victory. The bal-

SOUTHEAST ASIA, 8TH-9TH CENTURIES

lista, first used by the Chams, also became incorporated into the Khmer equipment.

MILITARY ORGANIZATION

During its Angkor period (802-1431), the Khmer Empire, by force of arms, extended its commonwealth to encompass vast areas of Southeast Asia. The first attempts, in about 813, by a Cham general named Senāpati Par to test the united Khmer state were never more than raids, for Jayavarman II (c. 770-850) kept the empire firmly in his grasp. The strategies of the Chams, however, had been sharpened by their constant quarrelling with the Chinese on their northern frontier. As the Khmers and Chams battled, the Khmers too learned of new strategies and weapons, and a fairly homogeneous art of war was established.

The Hindu concept of war as a religious sacrifice was fully recognized by the Khmers. Therefore, much like the Javanese, the Khmers associated the ancestor mountain god, Hinduized as Shiva, with military ventures and prayed for his aid on the battlefield. At about the same time in Champa, 1064, Rudravarman III, also made ornate gifts to the goddess of the kingdom to show his devotion.

The commander-in-chief of both the Khmers and Chams was usually a prince, often the king's brother. Of other officers there is little detailed knowledge, but it seems that they would begin in the Royal Guard and then ascend to captain roughly a thousand men

for war. The officers were distinguished by the red parasols that they carried into battle. Moreover, as in Java, in the Khmer and Champa empires, the use of horses and elephants was confined to officers. Unlike the Indian custom, there was only one rider per elephant with a shield on his left arm. The number of horses was limited, as they were difficult to procure from China; therefore, there probably did not exist a cavalry division in either army. An accurate number of soldiers for either side is also difficult to ascertain. It seems that there were roughly 50,000 soldiers assembled on one side in the fourth century, a number that increased with time. By the eighth century, the royal guards alone numbered 5,000. On both sides, the infantry formed the greatest part of the militaries' strength.

According to Chinese texts, Cham weapons consisted of shields, spears, halberds, bows, and crossbows. The arrows of bamboo, however, were not feathered, but the points were poisoned. Cham sculptures also show swords and daggers. The lance, or spear, was the most common of the Khmer weapons, and cases of them were attached to the sides of the elephant platforms. By the twelfth century, the lance had largely replaced the sword to become the most distinctive of Khmer arms. The club, which was the weapon of the Khmer gate guardian, was relatively rare in the hands of warriors. Bows and arrows were also used for distance fighting. For protection the Chams had cuirasses made of plaited cane in addition to their shields. The Khmers used this armor as well, but in a more limited capacity; it seems it was used more for parades and than for actual fighting. The Khmers also fought bareheaded, though the Chams are shown in sculptured relief wearing a reversed flower headdress.

It is known that during the thirteenth century, the commanders of the Javanese army received an annual salary of twenty taels of gold, and the soldiers, 30,000 in number, also received fixed annual pay in varying amounts in gold. The reliefs of the temples of this time reveal little. An inscription of 1294, alongside reports in Chinese annals, tells much about the results of the fighting that took place in repelling the Mongol invaders and in establishing the Majapahit Dynasty, but almost nothing about the nature of the warfare.

Doctrine, Strategy, and Tactics

The Khmer and Cham empires also had considerable knowledge of fortification. The Cham capital was a mountain of bricks dominated by pavilions and towers reaching 70 or 80 feet. The Khmer capital of Angkor Thom was also built up of massive stone walls, which, in the twelfth century, replaced earlier defenses of moat and mound. Despite its seemingly impenetrable fortifications, in 1177 Angkor fell to an unexpected Cham naval attack. It was not only Champa that possessed a navy, however; the Khmers also practiced naval warfare. The Chams often employed fleets of more than one hundred vessels, which were almost exclusively barges propelled by rowers. The fleets on both sides operated in conjunction with armies that relied on boarding, not ramming. Both sides were armed with long spears and shields, and in one relief of the period, a Khmer barge is filled with archers. This suggests that the bow was used in naval warfare before the close combat began. Naval warfare was limited at this time, however, as navies could not venture far from a shore held by friendly forces, because of the need to frequently replenish fresh water supplies.

The ideal type of army exchange was to bring about a pitched frontal battle. In a battle such as this, once some important leaders had been slain or had run away, the defeated side usually fled to the sheltering jungle. Chinese accounts claim that the Cham soldiers fought in parties of five, and the members mutually helped one another. If one fled, the other four were liable to be punished with death. Once the battle was over and a victor clear, it was the custom for the conqueror to set up pillars to commemorate victory. A similar system operated in Java and in the Majapahit Empire.

Concerning the early Mon warfare and that of the Burmans of the Pagan Empire, these civilizations left no bas-reliefs illustrating their ways of war, and the spiritual practice of Buddhism did not condone the glorification of warfare in inscriptions. It can only be assumed that, because they were an Indianized people, the early Mons and Burmese adhered to Indian models of warfare. The capital of the Thai state was established at Ayutthaya in 1350 and, following this,

the history of modern Siam is commonly traced. Although Siam ascended consistently in power and frequently kept its warlike neighbors of Japan, China, and India at bay, its history is plagued by centuries of quarrels between tribes, as the prominent provinces of Chiangmai, Ayudhya, and Sukhothai battled tirelessly for the semblance of a united kingdom under their respective rule. The second Siamese kingdom captured Angkor in 1352, after the Khmer kingdom had become weak and exhausted. In 1393 the Siamese took Angkor again, and in 1432 they captured it for the final time. Thus, although the Siamese had embraced Buddhism, they began to learn the ways of war from the dying Khmer Empire.

MEDIEVAL SOURCES

Few written sources exist regarding warfare in Southeast Asia during this period, and many of these are questionable. The earliest knowledge, extremely limited, comes from various Chinese sources beginning in the third century. This is often found in the form of accounts drawn from Chinese missions as well as pilgrims heading to India, especially the seventh century account of Xuanzang (Hsüan-tsang), the *Yijing (I-Ching)*. These often relate to economic vitality. Much knowledge comes from temple inscriptions in Cambodia and Myanmar, as well as monuments devoted to various kings, particularly in the Khmer and Pagan empires. Statues and basreliefs throughout the region indicate the nature of weapons and battle dress. There are also a number of annals that provide basic royal genealogies, especially from Cambodia, though these are often confused or incomplete. The dependencies of the Majapahit kingdom, for instance, are enumerated in Mpu Prapa ha's *Nagarakrtagama* (1365). Marco Polo recounts his twelfth century experiences in Southeast Asia in *The Travels of Marco Polo* (first transcribed in French in the fourteenth century as *Divisament dou monde*, or "description of the world," and translated into English in 1579). Some information has also been gleaned from sixteenth century Portuguese accounts of their early voyages in the region.

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Aaron Plamondon

THE MEDIEVAL WORLD

THE AMERICAS

The Maya and Aztecs

Dates: c. 1500 B.C.E.-1521 C.E.

Political Considerations

Warfare in Mesoamerica can be reconstructed only from the cultural remains that have been left behind in the portable art, sculpture, architecture, and documents of the ancient Maya and Aztecs. Although this incomplete record allows only a partial glimpse of the politics, military achievements, weapons, and strategies of these early people, archaeologists and historians have been able to reconstruct much of their ancient military and warfare history. The cultures and chronologies of the ancient Maya and Aztecs differed greatly, but many parallels can be drawn between their politics and warfare strategies.

The Maya

The ancient Maya were once thought to have been gentle stargazers; however, discoveries such as that in 1946 of the murals at Bonampak in Chiapas, southern Mexico, depict violent and bloody scenes of warfare and sacrifice. Because the Maya are a much older culture, there is less abundant information about their methods of warfare than those of the Aztecs. The ancient history of the Maya region is typically divided into three periods: the Formative (c. 1500 B.C.E.-300 C.E.), the Classic (250-900), and the Postclassic (900-1500). Whereas much of the contemporary knowledge of Aztec society stems from contact-period documents, the Maya population had already gone into severe decline by the time the Spanish conquistadores arrived in the Americas in the fifteenth and sixteenth centuries. Nonetheless, it is known that the Maya engaged in extensive civil war, often capturing the kings and other elite officials of competing city-states. It has been said that militarism and conquest were instrumental in creating and perpetuating a ruling elite and political centers. The success of an individual ruler was measured by his successful taking of captives, as depicted in much of the art and sculpture of the ancient Maya. Hieroglyphic texts often refer to the conquests of kings, and naked and defeated captives are frequently depicted below the feet of triumphant captors. Early conflicts were generally not waged over long distances; instead, small-scale warfare was limited to local polities. As conflict grew over limited resources, warfare remained localized but became endemic. Captives became a necessary element in the inauguration of a new king, at the dedication of a new building, or for other sacred events; this need continued to motivate the Maya to invade neighboring polities. The intent of Mayan warfare was not to expand territory but to increase the prestige and power of the successful raiders.

The Aztecs

The Aztecs, wandering barbarians, arrived late in Mesoamerica, settling at the site of Tenochtitlán in 1345 C.E. Over the next century, they assembled inexhaustible armies that marched hundreds of miles from the Valley of Mexico to confront and defeat rival cultures. Although they were a dominant power for only slightly more than one hundred years (1400-1521 C.E.), they were able to create an empire, maintain extensive economic trade routes, and appropriate the military organization, arts, and cultures of their subjects, incorporating them into their own civilization.

Religious fervor drove the Aztecs into constant war to capture political prisoners for sacrifice to their gods. Gory images of war captives with their hearts gouged out have been inextricably tied to the Aztecs.

Military Achievement

The Maya

The greatest military achievement for the ancient Maya was the successful capture and sacrifice of a

Ancient Mesoamerica

king from a neighboring and competing polity. Although this was a relatively rare event, it was depicted with both hieroglyphic text and images on the monuments of the victorious king. This visual and textual propaganda legitimized the power of the ruling king and often had profound effects on the cities of both the victor and loser. For example, in the first millennium C.E., when the king of the less powerful center of Quiriguá captured the ruler of the dominant center of Copán, Quiriguá was able to catapult itself into a more powerful position, while Copán went into a minor decline in authority and influence. The defeat of a ruler was an exacting blow to any city, and it placed the losing city in a state of flux. According to tradition, a new ruler could not be put in place until the preceding ruler had died, and in some cases, captured rulers were kept alive in order to weaken the power of the competing polity.

The Aztecs

Military achievement for the ancient Aztecs was measured by the expansion of territory through intimidation of enemies in battle or simply the threat of battle. After the Aztecs had successfully moved into a new area, they became reliant on local leaders to successfully maintain their domains. Rather than install their own leaders in newly conquered areas, at the expense of their own human resources, the Aztecs would allow local leaders to remain in their positions under Aztec power. The Aztecs allowed the vanquished to maintain their traditional systems of trade and markets, while at the same time extracting some of the local resources as tribute. This system of loose military alliances allowed the Aztecs to spread their forces across a much broader region. The Spanish noted at the time of contact that the Aztecs were a fierce people, with a skilled military that lacked a fear of battle. Although there are few monuments dedicated to the successful military achievements of individuals, extensive records of tribute were documented, indicating the territory that was maintained and the resources that were extracted. Successful soldiers were highly valued and were rewarded for their valor with the special recognition of promotions and distinctive uniforms.

Weapons and Armor

Weapons

Due to the fragmentary archaeological record, it is unlikely that a conclusive inventory of the weapons, uniforms, and armor of the ancient Maya and Aztecs will ever be cataloged. However, depictions in art and documents from the pre- and postcontact periods do give insight into the more common and important weapons of warfare employed by these cultures.

North Wind Picture Archives via AP Images

An Aztec warrior, carrying a wooden sword with stone blades and a decorated shield and dressed in cotton armor and an animal-head helmet.

Projectile weapons, used at a distance to strike at an enemy, include the bow and arrow, the sling, the dart, and the all-important atlatl. The atlatl, or spear-thrower, allowed the user to launch darts at greater distances than hand-thrown darts could be thrown. Depictions of the atlatl indicate that it had been used since the Classic period (250-900 C.E.). Atlatls were often ornately decorated with low-relief carving and even gold. The few existing examples are about 2 feet long, with a hook at one end where the barbed darts were attached. In some cases, loops were affixed to the other end of the weapon and used as finger grips. Many of the more extravagant atlatls were probably used only in ceremonies but were nonetheless extremely effective weapons in war. Spanish accounts attest to this potency, asserting that the darts could penetrate any armor and deliver a fatal wound. Experimental archaeology has confirmed that an experienced atlatl thrower could hurl a dart up to a distance of 243 feet and that atlatls allowed up to 60 percent more accuracy than did an unaided spear.

The bow and arrow was another commonly used weapon in Mesoamerica. Bows measured up to 5 feet in length, and bowstrings were often made of animal sinew or deerskin. Arrows used in war had heads made of obsidian or fishbone and included barbed, blunt, and pointed styles. There is no indication that either the Maya or the Aztecs put poison on their arrow tips, but apparently both used fire-arrows to shoot at buildings. Experiments indicate that traditional arrows could be shot to ranges between 300 and 600 feet and that skilled archers could easily penetrate quilted cotton armor.

Slings made of maguey fibers, from agave plants, were used to catapult rounded, hand-shaped stones at adversaries. Stones were often collected in advance and apparently could be thrown more than 1,300 feet. Slings were often used with bows and arrows and could be extremely effective for penetrating the heavy Spanish armor.

Weapons used in close combat included the thrusting spear, which was actually most productive for slashing and parrying. Depictions from contact-period drawings indicate that the weapon was approximately 6 to 7 feet in length, with a roughly triangular head that was laced with closely set stone blades forming an unbroken cutting edge. The Aztecs also had one-handed and two-handed wooden swords, with obsidian or flint blades adhered into grooves along the edge of the weapon. According to the Spanish, these blades were more effective than Spanish swords. Other weapons included wooden clubs, sometimes with a circular ball on the end that was most forceful on downward blows. Axes, blowguns, and knives were also known in Mesoamerica but were more likely used in hunting than in warfare.

DEFENSIVE ARMOR

Shields, helmets, and armor were used in Mesoamerica as defensive weapons. Shields were usually made of hide, wood, palm leaves, or woven cane with cotton backing. They were decorated with feathers, paint, gold, silver, and copper foils and were round, square, or rectangular in shape. A shield's decorations were often reflective of the status and caliber of its user. The shield's primary use was as protection from projectiles; it probably was not very effective against clubs and swords.

Armor was made of a quilted cotton consisting of unspun cotton placed between two layers of cloth and stitched to a leather border. The thickness of the armor protected wearers from darts and arrows and was better suited than metal to the heat and humidity of Mesoamerica. Soldiers wore various styles of jackets and pullovers, which protected their upper bodies and thighs. Lower legs were protected with cotton leggings, although few weapons targeted this area of the body. War suits of feathers and fabric, or feathered tunics, were worn by higher-ranking warriors over their cotton armor. Some helmets were made of wood and bone and decorated with feathers, whereas others were made out of the heads of wild animals, such as wolves, jaguars, and pumas, placed over a wooden frame. The soldier's face could be seen in the gaping mouth of the animal's open jaw.

Military Organization

The Maya

The Maya's military organization appears to have been much less formalized than that of the Aztecs. However, those involved in conquest appear to have been afforded high status in society. Warriors, with their ability to seize captives, played a critical role in bringing power to a king and his city. Considered members of the elite class, they wore elaborate regalia and participated in rich ceremonies when they brought captives back to their king. Warriors also participated as ballplayers in the ball game that reenacted the ritual capture and eventual sacrifice of important rulers and elites from other sites. Although ballplayers and warriors were frequently depicted on portable art, they are almost never identified as individuals in texts. Kings, however, were recognized and regularly depicted as warriors, and the military prowess of their warriors was broadcast as their own success. Battles were generally short, limited in geographic scope, and usually timed around significant historical events. This system of warfare, unlike that of the Aztecs, afforded the Maya the luxury of not needing to maintain a huge standing army.

The Aztecs

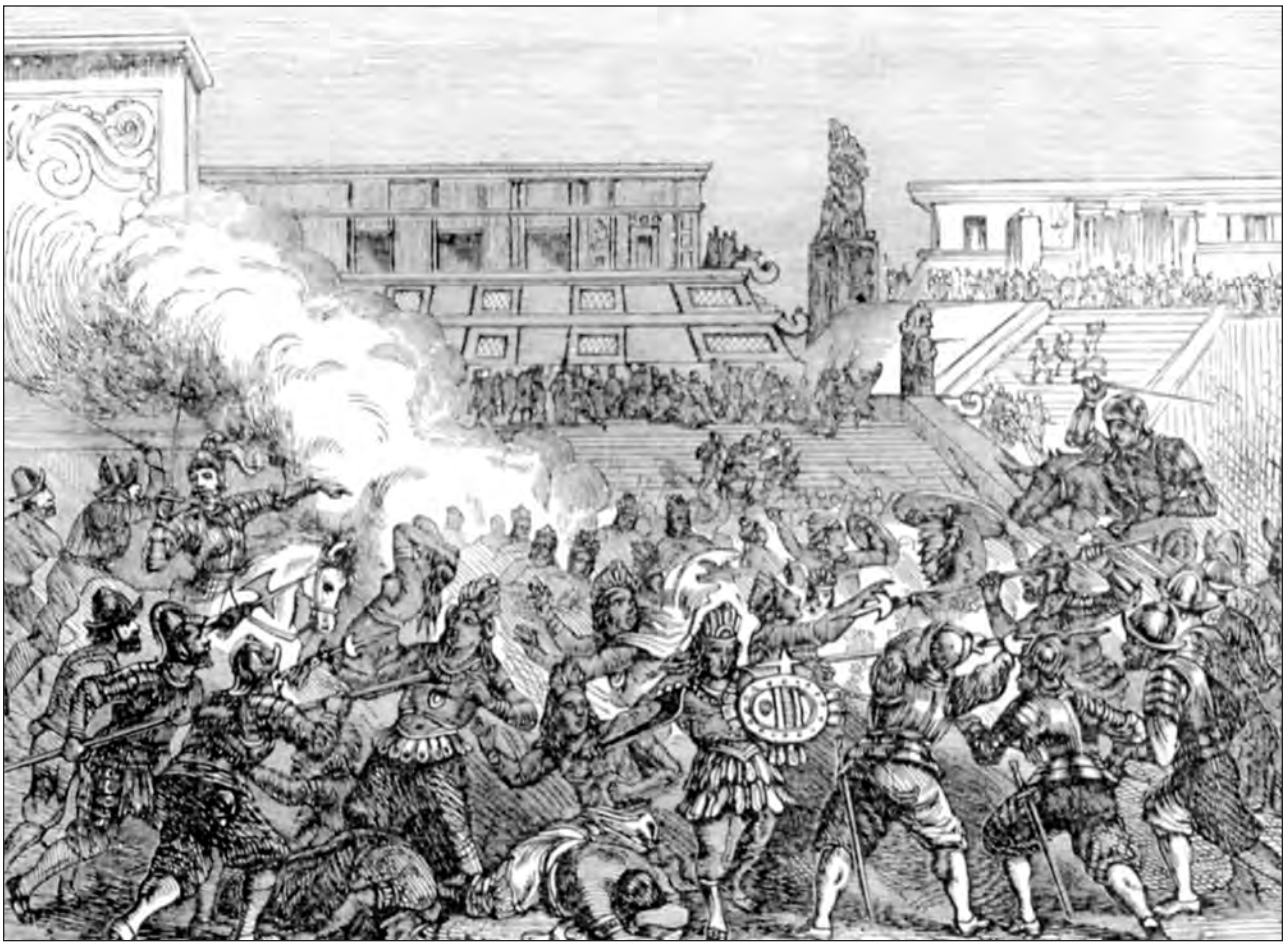
Aztec society was highly stratified, and military ranking was intimately tied to this overall social organization. The ruling nobles were placed in positions of higher rank, based on their birthright and social status, whereas the commoners often earned their military status through their skills in warfare. Most commoners paid their dues to society through the production of goods for tribute and labor, and many of them served in the Aztec military. All those who assisted the military were given extensive training in the use of weapons and the taking of captives, although those of higher status were provided with more thorough instruction. Soldiers who successfully took multiple captives were rewarded with promotions and uniforms signifying their accomplishments. Appropriate jewelry, hairstyles, body paint, and other insignia were also indicative of a soldier's status, and higher-ranking individuals were given privileges such as the rights to consume human flesh in public, to have mistresses, and to feast in the royal palaces.

Doctrine, Strategy, and Tactics

All Mesoamerican cultures were limited by the lack of efficient transportation beyond human foot traffic. Although Mesoamerican cultures did have knowledge of the wheel, the harsh environment limited their ability to use it effectively. Draft animals were not introduced to the area until after the contact period. Transportation difficulties limited the cultures' abilities to control regions and their resources from long distances. The Maya and the Aztecs each developed different systems to maintain their political control over competing cities.

The Maya

The most effective method through which the Maya gained control over a competing city was either that of a royal marriage or that of a conquest, which was often the preferred choice. Ancient monuments at several Mayan cities depict both such events. Many sites, including the major city of Tikal, exhibited earthen walls along their boundaries as a form of protection from these battling neighbors, although they often proved ineffective. Numerous depictions in both text and art indicate that kings would send elite soldiers to raid smaller, less powerful polities and to capture and bring back important personages as prisoners. Low-ranking captives were often put into slavery or other service, while higher-ranking officials were displayed to the public and eventually sacrificed. These raids were important to validate the power of new polities and were frequently reenacted in the ritual ball game, an event held in elaborately built ball courts. The triumphant city would host the ball game as a ritual competition, after which the losers would be sacrificed. The Maya, believing in the cyclical nature of time, often planned their raids and reenactments to coincide with meaningful anniversaries of past events.



R. S. Peale and J. A. Hill

Hernán Cortés and his troops ended an indigenous rebellion in Cholulu just prior to the Spaniards' sacking of Tenochtitlán and the fall of the Aztec Empire.

THE AZTECS

The Aztecs instituted a system in which local rulers of conquered areas were allowed to remain as heads of these areas, which were then required to produce and transport goods as a form of tribute to their conquerors. The Aztecs decided that, rather than leave behind their own garrisons to maintain controlled areas and extract large amounts of resources, they would instead lower the costs of administration and leave the control of conquered areas in the hands of local officials. Although this policy meant that Aztecs could not extract the maximum amount of goods from these conquered areas, it freed up soldiers and officials to continue their expansion into more distant areas. Campaigns were often scheduled around practical factors, including agricultural and seasonal cycles, such as the rainy season. This schedule often limited the ability of the Aztecs to run year-round crusades, and they had to depend on the local politicians to maintain their power.

The rulers of the Aztec Empire kept the local rulers of their loose alliance in line by continually intimidating them and engaging in warfare. Those who did not comply were harshly punished, and members of neighboring cities were often used to aid in these raids. Aztecs often pitted traditional adversaries against one another, and the threat of impending attack often allowed them to coerce loyalties without

ever having to do battle. The Aztecs often used spies to gain military intelligence. Individuals were sent into rivals' territories dressed in their clothing and speaking their language. Spies were useful for obtaining strategic information about their foe's fortifications and preparations but were often caught or turned against their own. Although the overall military strategy of the Aztecs was fraught with problems, their system allowed them to maintain the largest political domain in all of Mesoamerica.

Contemporary Sources

Maya

Although the Maya codices do not deal with the topic of Mayan warfare and the contact-period documents deal with a culture in severe decline, some recent volumes have begun using the Maya's own texts and documents to look at aspects of elite society, including war and conquest. In Linda Schele and Peter Mathews's *The Code of Kings: The Language of Seven Sacred Maya Temples and Tombs* (1998), the authors decipher the ancient hieroglyphs on the monuments and buildings of seven Classic-period sites to reveal what the ancient Maya had to say about themselves. In it, there are numerous discussions of warfare between major cities, including war tactics, sacrifice, the ballgame, and war imagery. Matthew Restall's *Maya Conquistador* (1998) retells the Spanish encounter with the Maya from the Maya point of view. Using documents written by the Maya at the contact period, Restall allows the Maya to retell what the conquest was like. This book allows the reader to see that these brutal interactions with the Spanish fit into the Maya's cyclical worldview, and that they continued to deal with outsiders the way they had for hundreds of years. Both of the volumes offer an innovative and inside view of the native perspective of warfare and conquest. For a more traditional look at the contact period, a classic document is the 1941 translation by Alfred M. Tozzer of the original *Relación de las cosas de Yucatán* (1566; English translation, 1941); also known as *Yucatan Before and After the Conquest* (1937) by Bishop Diego de Landa, available in the papers of the Peabody Museum of American Archaeology and Ethnology at Harvard University. This significant document provides great insight into the contact period from the perspective of a Spanish bishop attempting to save the souls of the Mayan natives. In it, he describes the expeditions of the conquistadores in Yucatán, as well as Mayan culture and warfare, with information obtained from native informants and his own observations.

Aztecs

When the Spanish encountered the Aztecs in 1519, they discovered an empire that covered much of Mexico. Numerous contact-period documents describe the process of the Spanish conquest: the individual battles and the eventual taking over of Aztec society and its empire's tribute. Various chronicles, including *Historia de las Indias de Nueva-España y Islas de Tierra Firme: Mexico* (1579-1581; *The Aztecs: The History of the Indies of New Spain,* 1964), by Diego Durán; *Obras Historicas* (1891-1892), by Fernando de Alva Ixtlilxóchitl; *Crónica Mexicana* (1598), by Fernando Alvarado Tezozómoc; and *Relaciónes Originales de Chalco Amequemecán* (c. 1620), by Domingo Chimanlpahín, describe Aztec military campaigns, dynastic relationships, and political and military strategies of assassination, bribery, and manipulation. These documents also reveal that Aztecs were more concerned in warfare with acquiring goods and services from a region than with occupying the territory themselves. *Historía Verdadera de la Conquista de la Nueva España* (1568; *The Discovery and Conquest of Mexico, 1517-1521,* 1844), considered the classic volume on the Spanish conquest, was written by

Bernal Díaz del Castillo (1496-1584), a conquistador under Hernán Cortés who witnessed and documented wartime events, including more than one hundred battles, and the imprisonment of the Aztec king Montezuma II (c. 1480-1520).

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Jennifer P. Mathews

The Incas

Dates: c. 1200-1500 C.E.

Political Considerations

The Incas were one of many South American tribes engaged in a power struggle in the Andean highlands from the thirteenth century through the middle of the fifteenth century. Prior to this time, this region had been occupied by many different tribes. Between 500 and 1000 C.E. the Tiahuanco and Huari cultures, for example, developed large urban settlements and organized state systems. During the years from 1000 to 1456, however, the region encompassing modern Colombia, Ecuador, Peru, and Chile experienced a process of fragmentation that resulted in the development of small, regional states. Although warfare between different tribes was common, no one group was clearly dominant. The Incas were just one of the many tribes involved in warfare in the southern highlands near modern Bolivia. They were not especially strong at this time and had to form alliances to survive. The Chanca and Quechua tribes in the Apurímac Basin and the Lupaca and Colla tribes in the Titicaca Basin presented the biggest threats to the Incas, who, until the fifteenth century, dominated only a small area near Cuzco.

Military Achievement

Under the leadership of the Incan warrior Pachacuti (c. 1391-1471), the Incas defeated the Chanca tribes in a battle at Cuzco in 1438. According to legend, the boulders on the battlefield became warriors who fought for the Incas. After this victory, Pachacuti became emperor, and the Incas began to expand their territory by conquering other tribes. Under Pachacuti the Incas emerged as the strongest military power in the southern highlands, and their territory stretched as far south as the Maule River in modern south-central Chile. Unlike other peoples, however, the Incas did not loot and abandon vanquished tribes, but rather they incorporated these former foes into their own military. The Incas conquered the western Titicaca Basin and nearly all of the Urubamba, Apurímac, and Mantaro Basins during the twenty-five years following their defeat of the Chancas. The military and logistical support provided by the vanquished tribes enabled the Incas to control the territory of the southern highlands and to begin expanding their territory through conquests along the northern coast. The defeated Chancan tribes, now fighting for the Incas, began conquering the northern tribes, which formed a part of the Chimú Empire.

The Incas attacked and defeated the Chimú tribes after Topa Inca Yupanqui (r. 1471-1493), Pachacuti's son, led attacks as far north as Ecuador before returning south along the coast. He extended the Incan Empire and maintained his father's policy of incorporating the vanquished tribes into the military. His son, Huayna Capac (r. 1493-1525), succeeded him as emperor and solidified the empire by conquering smaller areas throughout Ecuador, expanding Incan territory as far north as Colombia and establishing boundary markers to the Angasmayo River. Huayna Capac made Quito the northern capital of the empire, which spanned 2,500 miles. The Incas called their empire Tahuantinsuyu, meaning "the land of the four quarters." The Incan territory was divided into four regions and subdivided into more than eight provinces.

Weapons, Uniforms, and Armor

The Incas had an advanced Bronze Age technology in the fifteenth century that served as the foundation of the military force. The sling was the deadliest projectile weapon. Other effective weapons included bows and arrows, lances, darts, a short variation of a sword, battle-axes, spears, and arrows tipped with

Library of Congress

An Inca-style battle scene in which warriors wear helmets and quilted tunics and wield swords, axes, and spears in hand-to-hand combat.

copper or bone. The weapons used by the Incan lords were decorated with gold or silver. For protection military leaders wore casques, or helmets, made from wood or the skins of wild animals and decorated with precious stones and the feathers of tropical birds. Soldiers wore the costume of the province from which they came; their armor consisted of a wooden helmet covered with bronze; a long, quilted tunic; and a quilted shield. The soldiers, who jogged at a pace of about 3 miles per hour and traveled nearly 20 miles per day, carried only their own supplies, while an army of soldiers was responsible for carrying baggage on their backs. Garrisons were housed in fortresses, whereas detachments occupied storehouses, which consisted of magazines filled with weapons, grain, and ammunition. Sacsahuamán, the site where the Incas defeated the Chancas, was the only fortress garrisoned by the Inca people. Sacsahuamán was only one of many Incan fortresses; others included Paramonga, a fortress constructed like a mountain of adobe bricks that had once been a part of the Chimú kingdom. These storehouses provided the army with food and clothing, thus avoiding the necessity to pillage villages as the army traveled across the country.

MILITARY ORGANIZATION

The Incan military was highly organized and consisted of nearly 200,000 soldiers. The military served as a public service organization that brought food and materials from one region of the country to another and trained specialists who contributed to the growth of the empire. In order to prepare future soldiers, military training took place on a bimonthly basis and began with boys as young as ten years old, who took part in physical activities such as wrestling, weight lifting, and sling shooting. This training enabled the Incan commanders to determine which soldiers could be used as specialists, such as builders, stonemasons, bridge experts, and assault leaders. Village elders reported on the progress of the boys, whom the military drafted as either warriors, carriers, or craftsmen. Short-term service drafting ensured an ample supply of young men in each district. The periods of service depended upon climatic conditions, and not all men returned to civilian life. The commanders ordered the most outstanding soldiers, those who were the bravest, the most disciplined, and the most adept at fighting, to remain permanently in the military.

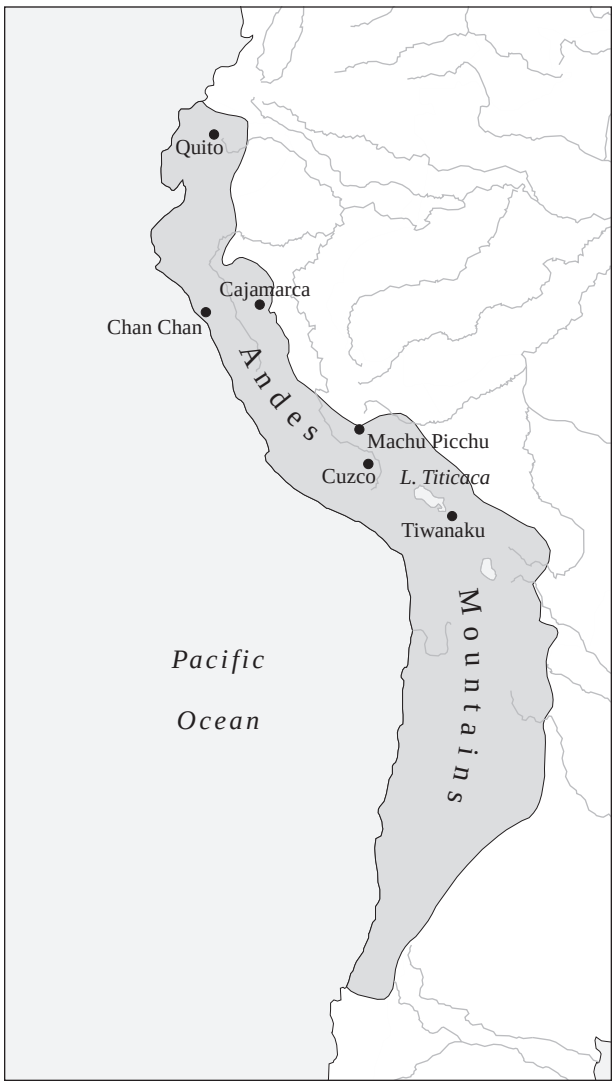
The organization of the army was similar to that of the decimal system utilized by the Romans. Although the commanders were usually members of the Incan royal family, many ascended from the ranks because of their extraordinary ability and devotion to the emperor. One of the demands placed upon the commanders, who had to deal with the logistical problems of the roads and supplies, was to calculate the most efficient way to move their military across the country. Because the strategy was to fight only if absolutely necessary, the commanders had to ensure a deployment of soldiers superior to that of the enemy and would not waste manpower by sending too many. On important occasions, the emperor personally assumed command of a campaign. Topa Inca Yupanqui, for example, took personal command of an effort to expand the empire by overseeing the extension of the main highways, a task too difficult for an army commander to handle alone. Soldiers were required to participate in battles as far away from their homes as possible in order to avoid fraternization and to allow them to experience the vastness of the country and the grandeur of the empire. Because the purpose of the military was both to defend and to extend Tahuantinsuyu and to serve the Sun God, individual glory in battle was not valued by the Incas.

DOCTRINE, STRATEGY, AND TACTICS

The primary aim of the Incan military was to spread the worship of the Sun and to seek harmony through the integration of so-called barbarians—who lacked military discipline, worshiped false gods, and practiced human sacrifices and cannibalism—into the Incan culture. The Incas believed, therefore, that their conquests were justifiable and were motivated by a desire to improve the quality of life of their vanquished tribes. The Incas traveled with the purpose of disrupting the lives of Peru's inhabitants as little as possible. Specialized engineering corps designed and constructed the travel routes, which extended through the mountains and along the coastal desert. The same corps of engineers also constructed giant suspension bridges where necessary. Different armies followed each route, and they eventually met before advancing. Because the idea behind the creation of Tahuantinsuyu was to spread universal peace, the Incas often showed mercy to the vanquished tribes and pursued peaceful resolutions whenever possible.

The principal strategy utilized by the Incas to defeat their enemies was to destroy harvests and inflict famine. War, however, was often the only option. The slingers, due to their accuracy, began the attack on a fortress. Their sling bolts easily pierced the Peruvian helmets worn by their enemies. Feints were

THE INCA EMPIRE, 1493-1525



often used to draw defenders away from the center of an attack. Soldiers assembled human pyramids to attack the higher walls of enemy fortresses; the pyramid shape enabled the soldiers to attack quickly with their maces. The skin of the captured leaders was often made into drums used at festivals celebrating Incan victories. After killing the leaders, the Incas ripped out their intestines, dried the bodies as carefully as possible, fitted the abdominal skin over a bentwood frame, and finally placed the skin on a carrying frame. Although these drums were not very musical, they served as amusement for the Incas and as a warning of the fate of those who dared to resist the Incan emperor. Most leaders, however, surrendered and were incorporated into the Incan system of government. The Incas roped their prisoners together and sacrificed a few to the Sun God. Most of the prisoners, however, were detained long enough to ensure that they would cooperate with the Incas and contribute to the empire. The only prisoners who endured slave labor were the ones assigned to maintain the Incas' standards for roads and villages.

The evolution of the Inca Empire was an ongoing process, as each succeeding Incan emperor tried to continue the military plans of his predecessor. After each conquest, the Incas allowed time for the settlement of the new territory before pursuing the next one. This interval also gave the vanquished time to assimilate the Incan culture and to prepare to fight in the name of their new god. The receptions given to Incan sovereigns in the capital after a conquest rivaled Roman triumph celebrations in pomp and ceremony. Dressed in the colorful costumes of their provinces of origin, the people greeted their victorious ruler, who was borne aloft in a golden chair raised on the shoulders of his nobles, as he passed beneath arches erected along the route to the Temple of the Sun. Alone in the temple, because attendants were not permitted to enter, the sovereign, barefoot and stripped of his regal costume, gave thanks for his victory. A large celebration followed in which music, dancing, and bonfires commemorated the addition of a new territory. The Inca Empire, in reality, was a confederation of tribes with the Incas in control of a common government, a common religion, and a common language. A council of rulers ruled each of the tribes, which pledged its allegiance to the emperor, who, as a descendant of the Sun God, was considered divine. The conquered tribes maintained their individual cultural identities, but they paid Incan labor taxes; payment ensured that every individual received fulfillment of all of his or her basic needs. Although the inhabitants of each conquered town spoke their native languages, the Incas also imposed the Quechua language on them in order to enable communication among the different peoples.

MEDIEVAL SOURCES

El Inca Garcilaso de la Vega (1539-1616), the son of an Incan princess and a Spanish explorer, provides a detailed account of the Incan civilization both before and after the arrival of the Spaniards in his *Los Comentarios Reales de Los Incas* (1609-1617; *The Royal Commentaries of the Incas*, 1688), which remains one of the most complete and accurate available sources of information about the Incas. In the first part of this book, completed in 1609, Garcilaso de la Vega chronicles the development of the Inca Empire and discusses the political and social status of the Incas, as well as their legends, traditions, customs, and methods of warfare. The second part, written in 1617, describes the wars of the Spanish conquest, in which Garcilaso de la Vegas's father was a primary figure. "El Inca" bases the second part of his history on the stories told to him by soldiers and conquerors who fought alongside his father.

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Michael J. McGrath

North American Indigenous Nations

Dates: c. 12,000 B.C.E.-1600 C.E.

Political Considerations

Among the southeastern and southern North American chiefdoms of the Mississippian period (900-1540 C.E.), there were cities designated as "peace towns" and "war towns," which were occupied alternately during times of peace and war. There were also chieftains who bore the same designations and alternately led their people during these times. The "Red Chief" led in times of war, and the "White Chief" in times of peace. This system continued through to the early eighteenth century, when the Chickasaw of northern Mississippi, who were in periodic conflict with the Choctaw and their English allies, would turn leadership over to their Red Chief and remove their people to the red towns when hostilities loomed. It is assumed that this elaborate tradition of response to war and peace was in place long before the European contact.

Apparently, there was no effort on the part of Native American groups in the South and Southeast to develop what could be called empires. The chiefdoms controlled large areas that included many towns, but distance was an important factor in the amount of control a small group of native nobles and priests could have over a large territory. The Natchez of western Mississippi, near the city now bearing that name, along the Mississippi River, were probably the best and most advanced example of centralized control over people. The Great Sun was the absolute ruler, presiding over a tightly controlled class system that included four distinct classes: the Great Sun and his immediate family, the Nobility, the Honored Ones, and the Stinkards, or agricultural peasants. It is unlikely, however, that the total Natchez population ever exceeded 5,000 or 6,000, and the territory controlled by the central government was, by modern standards, extremely small. Some distance had to be maintained between chiefdoms to prevent encroachment upon one another's territories. These buffer zones also served as hunting territory.

Other politically advanced chiefdoms were groups later known to the Europeans as the Chickasaw, Choctaw, Seminole, Timucua, Quapaw, Catawba, Tunica, Caddo, Shawnee, Chitimacha, Calusa, Tuscarora, Pamlico, and Powhatan. This Mississippian, or "temple mound," group of cultures extended from Virginia to Oklahoma and from the Ohio River to the Gulf and Atlantic coasts. The Mississippian peoples also extended some distance up the Mississippi River into Wisconsin. At the peak of their development in the late fifteenth century, they probably included no more than one-half million people. They, like most of the Native American groups, periodically fought small battles with each other, but the fighting was mainly precipitated by encroachments into hunting territories, or misunderstandings stemming from language differences. For instance, the Chickasaw often drove the Kickapoo out of their hunting grounds in present Tennessee and Kentucky, east of the Tennessee River. The Cherokee and the various Muskogean peoples—the Chickasaw, Choctaw, those who later made up the Creek Confederation, and the Seminole—were generally hostile to each other because the Cherokee, who had arrived in the Southeast in the twelfth or thirteenth century, spoke an Iroquoian language. The Muskogeans all spoke closely related dialects of the Muskogean language.

One of the most politically advanced groups in the East and Northeast was the Iroquois Confederacy, a United Nations-type alliance that had been organized by the sixteenth century. An increase in separate tribal identities had begun in the fourteenth century, perhaps as a male response to the increasing

Native Peoples of Eastern North America, c. 1600

North Wind Picture Archives via AP Images

West Indian natives and Spanish explorers clash at Columbus's settlement at La Navidad.

importance of women in food production, with the spread of maize agriculture in the Northeast during this time. Male prestige, which had previously resulted from the successful hunting and auspicious bravery during the hunt, declined, and men roamed farther from home for longer periods of time, encroaching on the territories of others with whom they engaged in violence, all in search of prestige. Another view involves the trade in prestige items such as copper, obsidian, sea shells, and exotic furs. As male prestige suffered among the Iroquois, raiding to obtain these items by force brought about increased warfare between related groups that had once traded peacefully. By the time of European contact, the Iroquois Confederacy was responsible for a somewhat peaceful coexistence between formerly hostile tribes in the East Lakes region, New England, and southern Canada. These tribes often joined forces to fight their hostile western and southern neighbors.

Another significantly developed political entity were the Anasazi, who were a fundamentally agricultural people occupying a large area of Colorado, Arizona, New Mexico, and Utah. They built great pueblos in such places as Chaco Canyon and Mesa Verde in the Four Corners region. Some believe that the far-flung Anasazi confederation was destroyed in the thirteenth century by raids conducted by Utes, Apaches, Navajos, and Comanches who had been driven out of adjacent habitats by a great and prolonged drought that impacted almost all of western

North America during what was called the Little Ice Age. During this time, crops failed and the courses of rivers changed. The successors to the Anasazi, known as the Pueblo peoples, an amalgam of the raiding groups, occupied, and continue to occupy, villages consisting of great adobe apartment complexes. These peoples were not, however, part of any large confederation, but rather were more like bands who often fought with one another for a variety of reasons, many trivial.

Along the coast of British Columbia, reaching into southern Alaska and Washington state, lived tribes such as the Tlingit, who were highly developed both socially and politically. These tribes maintained some degree of peace by engaging in the periodic practice of the potlatch, the ceremonial act of giving a great deal of a group's material possessions to another group, which was expected to reciprocate appropriately within a reasonable time. Northwestern tribes did, however, engage in frequent combat with their neighbors over hunting and gathering territory and perhaps in response to raids for obtaining women.

The archaeological record reveals that during the early fourteenth century there were hostilities between Native Americans who lived along the river valleys of the Dakotas and those who occupied the river valleys of Kansas and Nebraska. The southern group, probably responding to drought conditions, moved northward, forcibly encroaching upon the Dakota group. At the Crow Creek site on the Missouri River in South Dakota, more than five hundred scalped and mutilated bodies were unearthed from a shallow mass grave at one end of a defensive trench. Evidence indicates that this massacre occurred around 1325. Many other such occurrences have been documented by archaeologists.

It is certain that warfare did exist between Native American groups during the prehistoric period, though it was almost always on the small scale of war parties, perhaps the size of squads or platoons. Battles were seldom fought for the purpose of territorial conquest, but rather in response to encroachments into hunting territory, over misunderstandings due to language differences, for theft of prestige items, or in raids to obtain slaves or wives.

Military Achievement

Because no written historical record exists for North America north of the Valley of Mexico before 1500 C.E., warfare between groups of Native Americans cannot be documented with any precision. There are some oral sources but most information derives from archaeological evidence, which does point to violent conflicts. Many towns were fortified with palisades, bastions, and defensive trenches that would have been unnecessary had there not been real or potential enemy incursions.

Weapons, Uniforms, and Armor

The weapons of prehistoric Native American warfare would have been essentially, if not exactly, the same weapons as those used in hunting. These would have included the throwing and thrusting spear, dart, bow and arrow, hand ax, war club, hand pick or tomahawk, knife, accoutrements such as the atlatl (spear-thrower), detachable projectile points, body armor, shields, quivers, and knife sheaths.

The spear was probably one of the earliest Native American weapons, arriving with the earliest immi-

Turning Points

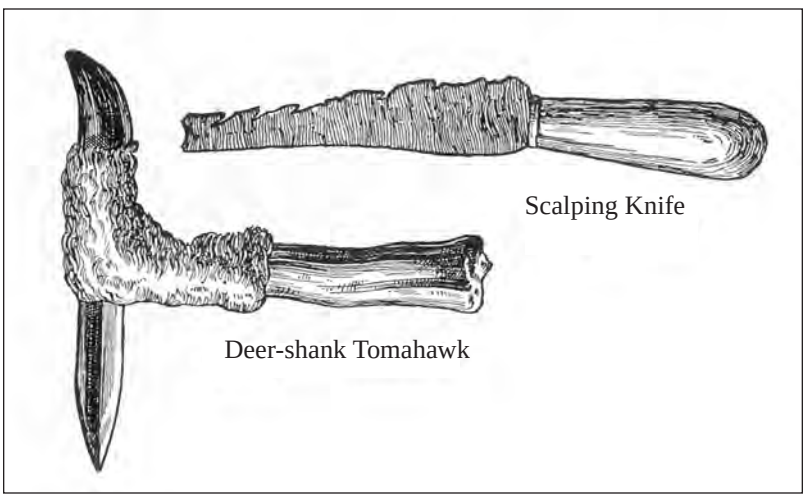
c. 400	The bow and arrow is introduced in eastern North America.
c. 700	Triangular projectile points are developed.
c. 1200	Destruction of southwestern Anasazi culture, possibly by raiding Ute, Apache, Navajo, and Comanche tribes.
c. 1300	An increase in separate tribal identities develops in response to increasing importance of agriculture and clearer definition of gender roles.
c. 1500	The Iroquois Confederacy, an alliance of separate tribes formed to fight hostile western and southern neighbors, is established in the Northeast.

grants across the Bering Strait land bridge fourteen thousand or more years ago. The evolution of its use in North America is believed to have roughly paralleled that in Eurasia. The spear was originally used as a thrusting instrument in the early Paleolithic period (c. 12,000 B.C.E.). It then progressed to the throwing spear by the late Paleolithic period (c. 8000 B.C.E.). The earliest evidence of the atlatl comes from the Fort Rock Cave in Oregon and dates to approximately 6500 B.C.E. At the Five Mile Rapids site east of The Dalles, Oregon, on the Columbia River, two atlatl spurs, which engage the tip of the spear at the throwing end, were discovered and found to be contemporaneous with the Fort Rock Cave atlatl. There are two basic types of atlatl: the compound, with the spur as a separate piece attached to the body of the atlatl, and the simple, which combines the two into one piece. The simple atlatl appears to have appeared somewhat later than the compound. By the late Woodland period (c. 400 C.E.), the simple atlatl and spear, or the shorter dart, were in use, along with the bow and arrow. They appear to have been used as a weapon until about the end of the Woodland period (c. 700 C.E.) in both the South and Southeast. The spear continued to be used after this time in the Great Plains and in the West.

The spear point was made of a variety of lithic materials. In the West, flint and basalt were used. Slate, being easily chipped, was common in the Northeast, whereas chert and flint were utilized in the South and Southeast, as well as the Great Plains. Horn was also known to be used. These points were hafted into a groove at the end of the shaft and secured with sinew and glue.

The spear was constructed from hard, straight woods such as hickory and oak in the East; yew and sometimes cedar in the West; and spruce, especially Sitka spruce, in the Northwest. Atlatls were often constructed of horn, such as that of the bighorn sheep, as well as wood. They had stone weights attached to their handles that enabled effective balance of the weapon in the hand of the thrower. The atlatl-thrown spear was a very effective weapon, but it was neither as effective nor as easily portable as the bow and arrow. During the temple mound period in the South and Southeast, the spear became a ritual item.

The bow and arrow appears to have been the principal weapon used during the period one thousand to twelve hundred years before European contact with native North Americans. Only the projectile points, or arrowheads, of spears have survived through time to the present day; the organic parts have been lost to decay. There are exceptions, however, in cases where weapons were deposited in dry caves. The time when the bow and arrow were introduced, and its diffusion throughout North America, remains a matter of dispute. Most archaeologists date its inception in the fourth or fifth century C.E. However, a few would put the introduction of this technology in about 500 B.C.E., and still fewer as far back as 4000 B.C.E. The earliest sites have been reported, and highly disputed, to be in the southern half of the Canadian Shield region, which includes Labrador and the southern taiga of eastern Canada. Some have suggested that bow and arrow weapons were diffused throughout this region through contact with Paleoeskimo (Inuit) peoples as early as 1500 B.C.E. At some pre-Dorset sites (1050 to 550 B.C.E.) in the eastern Arctic zone of North



North Wind Picture Archives via AP Images

Two types of Mohawk weapons.

America, the region that includes Baffin Island, small, chipped, stone projectile points have been found and interpreted to be arrowheads.

In the lower and middle Columbia River region of Washington and Oregon, small projectile points inferred to be arrowheads date as early as 550 B.C.E. Sites in the Willamette Valley of Oregon and Saint Lawrence Island, Alaska, place the bow and arrow in use as early as 50 B.C.E. If these inferences are true, the bow and arrow may have diffused from Asia to the Paleoeskimo (Inuit) cultures of the North American Arctic. It is known that there were strong lines of communication between prehistoric Inuit peoples. At the time of European contact, their languages, from those of eastern Siberia to those of eastern Greenland, were fairly uniform. Therefore, the bow and arrow could have diffused southward along both the Pacific and Atlantic coasts.

From these northwestern and northeastern locations, weapons technology moved into the Great Basin and the West Lakes regions by about 100 C.E. From these locations, diffusion into the East Coast and Southeast regions, the Colorado Plateau, and California occurred by about 400 C.E. It was probably another few hundred years (525-950 C.E.) before the bow and arrow reached the bulk of the Great Plains region.

Before the introduction of the horse by Europeans in the early sixteenth century, bows were commonly from 1.5 to 2 meters in length and were fired from a vertical position. Later the bowman on horseback used a much shorter bow and fired from a horizontal position. In the western and northern Great Plains, bows were often wrapped with sinew, which has elastic qualities. Because sinew-wrapped bows were prone to lose their tensile strength with exposure to high humidity, the craftsman would wrap the bow with rattlesnake skin, which is nonporous. Horn bows were also sometimes wrapped in a similar manner. Some bows resembled a curved lath, or rod, that was tapered in thickness from about 2.5 centimeters at the grip to about 1.5 centimeters at the tip. Other, compound, bows were elliptical in shape, bending outward from the grip; when strung, they bent gracefully in compound curves.

Bowstrings were fashioned from the tough shoulder sinew of the large male bison or elk. The sinew was separated into strands, soaked in water and a glue probably made from reduced vegetable and hoof materials, and finally twisted into a heavy cord. One end of the cord was always attached to one end of the bow, whereas the other end was attached to a notch on the other end only when the warrior was ready to string the bow for use. This allowed the bow to maintain its elasticity and tensile strength. The bowman often carried a spare string.

Arrows were made from essentially the same wood material as were bows. The length of arrows varied throughout North America. The Omaha, for instance, traditionally made arrows the length of the distance from the pit of the left elbow to the tip of the middle finger and back over the hand to the wrist bone, an average of 63 to 64 centimeters. Arrows were fletched with feathers—usually three—and some of the feather fletching extended a full one-third of the shaft length. The feathers had to be large enough to split, so the feathers of turkeys, prairie chickens, owls, chicken hawks, eagles, and vultures were preferred. The feathers, after splitting, were often tied to the shaft at both ends with sinew, allowing the middle section to be free from the shaft. The shafts were grooved from the fletching to the tip, and the design of the grooving varied from tribe to tribe. The purpose of this grooving has been lost through time, but some Native Americans of seventeenth and eighteenth centuries claimed that the grooves made the arrow fly a straighter course; some claimed they were bleeding channels, others claimed they kept the arrow from warping, and still others claimed they were occult symbols that ensured accuracy.

The notch on the arrow that fit on the bowstring was at the feather end of the arrow. This end was made a bit bulbous to facilitate a better grip with the thumb and index finger. The string was pulled with the other three fingers.

The arrowheads of war arrows were perpendicular to the bowstring, so that the arrows would easily pass between the ribs of the enemy. Hunting arrowheads were parallel to the string, so that they would pass through the ribs of game. Some reports claim that there was essentially no difference between hunting and war arrows, except that the arrowhead on

the war arrow was longer for more effective penetration. Arrows were often distinctly decorated among the tribes and among individuals. This decoration facilitated retrieval by the owner and also emphasized tribal distinctiveness.

Arrowheads took many forms even in the early periods of bow and arrow usage. By the late Woodland period, points were side notched and corner notched on the hafting, or attaching, end and these were of varying lengths to suit various purposes, such as hunting and warfare. The war arrowhead was the longest and most slender. Toward the end of the Woodland period and the beginning of the Mississippian, or temple mound, period, the triangular-shaped point became increasingly prominent.

These points were crafted by chipping and flaking any of several substances. Chert, flint, and obsidian were the most common materials; all are varieties of quartz. Chert, a poor-quality flint, was used when better qualities of raw materials were not available. Most arrowheads were made of good-quality flint. Flint, composed of extremely fine-grained sediment, has a concoidal fracture that easily lends itself to accurate chipping or pressure-flaking. Obsidian, or natural glass, is a volcanic rock and was available only in parts of the Rocky Mountains and the Cascade-Sierra Nevada ranges of the far West. Obsidian produced a super-sharp edge and could be easily sharpened when it became dull.

The arrowhead was hafted to the tip of the arrow shaft with sinew and glue. A notch was cut in the tip of the shaft, and the head was wedged into the notch. In the case of the war arrow, the head was sometimes detachable. It was loosely hafted to the shaft, and no sinew or glue was used. The head was simply wedged into the notch. If the arrow's victim attempted to pull the arrow out, the arrowhead would remain and increase the severity of the wound.

The bow and arrow was a very effective weapon of war. An arrow could be projected up to 500 meters and, in the hands of a skilled marksman, was extremely accurate at distances of 100 meters or more. The penetrating power of an arrow shot from a bow with a 40-pound pull had more penetrating potential than did a bullet shot from a Colt .45, and it was more accurate at long distances.

Bows were usually carried in highly decorated bow cases, and arrows were carried in equally elaborately decorated quivers that were slung over the shoulder and hung almost horizontally near the waist. Quivers were generally made of soft animal skins, such as that of the river otter.

In the Great Plains and in eastern North America, prehistoric bows often had a long flint blade or knife hafted to one end. These were used as bayonets in hand-to-hand combat. The Omaha called these weapons *mindehi*, which means "bowtooth."

The war club was a common weapon throughout North America. In very early times it was probably similar to the simple hand ax, made of ground sandstone with a groove near the top to permit it to be hafted onto a short wooden handle and lashed together with rawhide. During the temple mound period in the East and South, the war club was made of either stone or bone. The stone head, sometimes rounded, sometimes pointed, was hafted to a wooden handle with rawhide. Willow was a choice wood because it could be split on the hafting end and was pliable enough to wrap around the hafting groove. The whole assembly was wrapped with wet rawhide that shrunk tight while drying. A bone war club was a one-piece item made from one of the long bones of a large animal, the socket forming the rounded head of the club.

The Nootka of the Pacific Northwest often made their war clubs from whale bones. These war clubs were straight or slightly curved with a hole drilled in the handle end to facilitate a wrist thong. They were ornate objects, and intricate carvings of various designs are known. During the years of first European contact, war clubs of the Northwest were valuable trade items and carried great prestige.

Knives were bifacial instruments made of flaked or chipped flint or obsidian in most of North America. Ground or chipped slate knives have been found among the archaeological remains in the sub-Arctic Northeast. Some flint knives were as many as 75 centimeters in length and could be classified as short swords. Most, however, were considerably shorter and were hafted onto wooden handles in the manner of projectile points. The knife was often kept in a sheath made of leather, ornately decorated with shell

and beads, and worn tucked in the waist belt. The knife, like the war club, was very effective in close combat.

A type of armor was sometimes worn by warriors in battle. Some of it was constructed of bent wooden laths that were drilled and sewn together with rawhide. Armor was also made of the thick leather of buffalo or elk, folded several times and worn as a vest that covered the entire torso. This same material was used by warriors in the Northwest to make thigh and shin guards. It was very difficult to penetrate, even with arrows and thrusting spears. Shields were also carried into battle. They were generally made of wood, covered with leather, and painted with various designs that were believed to have magical powers to protect the warrior.

It is not known whether the Native American warrior wore distinctive dress or a type of uniform that set him apart from the nonwarrior, because such items have not survived to the present day. At the time of European contact there was no indication that a particular type of uniform set any tribal warrior apart from others. It might be inferred, though, that someone wearing only a loincloth but carrying all of his weapons, body armor, and a shield could be identified as prepared to fight. European observers in all parts of North America often reported that, except for chiefs and shamans, all the men seemed to be dressed similarly.

Military Organization

It does not appear that any Native American group in prehistoric times had a standing army or even a warrior class. Warriors were able-bodied young men who, when called upon to engage in violence, left their normal duties as farmers, hunters, and craftsmen and assumed the role of warrior.

Most violent encounters between groups seem to have been conducted by small bands of warriors numbering no more than twenty or thirty. Oral tradition indicates that battles started with an ambush and concluded with hand-to-hand combat. It is true that some groups displaced others from their traditional territories. The traditions of the Shawnee tell of their former home somewhere in central Tennessee, and it is believed that they were displaced to the north of the Ohio River by pressures from some of the Southern tribes during the fifteenth or sixteenth century. Choctaw and Chickasaw migration legends claim that these peoples originally came from somewhere to the west of the Mississippi River. These removals, though, could have resulted just as easily from environmental conditions as from warfare. It would not have taken a vast army to cause the removal of small groups from their traditional homes. Persistent attacks by small raiding parties, which could not be successfully rebuffed or answered by counterraids, would have been enough pressure to force migrations. There is no record until after European contact of large military assemblages descending upon an enemy.

Doctrine, Strategy, and Tactics

Little or nothing is known of prehistoric military doctrine or strategies, and what is known of tactics is simple. Some of the tactics would have come from hunting, involving moving silently before the attack. The shock of ambush with bows and arrows, usually followed by close fighting with clubs and knives, seems to have been the favorite tactic used in hostile encounters. The strategies and tactics used by Native Americans after European contact, involving large numbers of warriors, probably were not traditional and could easily have been due to European influence.

Medieval Sources

Native Americans north of Mexico, prior to European contact, had no written languages; therefore, no information except the archaeological record remains. Apart from some Viking and Welsh legends, which may or may not have any historical foundation, there is little in the Native American legends to provide details on the military history of the region before 1500.

Castañeda de Nágera (fl. sixteenth century), chronicler for Francisco Vásquez de Coronado (1510-1554), recorded what he witnessed in the Southwest from February, 1540, until the fall of 1542. Alvar Nuñez Cabeza de Vaca (c. 1490-c. 1560) traded along the Gulf Coast in 1535 and left a journal describing his trade in bows and arrows. El Inca Garcilaso de la Vega's (1539-1616) chronicles of the 1539 to 1543 expedition of Hernando de Soto (c. 1496-1540) through the South offer a glimpse of Native American warfare at the close of the prehistoric period.

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Charles Mayer Dupier, Jr.

THE MEDIEVAL WORLD

FROM MEDIEVAL TO MODERN

Handarms to Firearms

Dates: c. 1130-1700 C.E.

Nature and Use

Firearms are a Chinese invention for which the earliest evidence dates to 1130. By that time the Chinese were using gunpowder in primitive flamethrowers made of bamboo, wood, or metal tubes. Within another century they had developed gunpowder projectile weapons that fired lances, arrows, and probably balls. Beyond these early weapons, however, development of firearms did not proceed much further in China. Although most historians agree that thirteenth century Mongols brought gunpowder to Europe, where its first definitive mention is dated to 1267, there is no consensus on whether the Mongols also brought Chinese gunpowder weaponry to the West.

An English illustration from 1326 shows the earliest known gunpowder weapon in Europe during a siege. The first certain use of gunpowder weaponry in Europe occurred in 1331 during a siege of Friuli in northeastern Italy. A French source for the Battle of Crécy (1346) states that the English fired three cannons at crossbowmen in the French army as they advanced toward the English lines, but many historians do not accept the report's accuracy. At the English siege of Calais following their victory at Crécy, there is good documentation for the use of small cannons called *ribaulds*, but these cannons had only a small role in the siege. Over the next twenty years cannons increased greatly in size. During his 1377 siege of Odruik in the Netherlands, Philip II, duke of Burgundy (1342-1404), used cannons called bombards, which were capable of firing 200-pound stone balls. This occasion was the first known instance of cannon fire breaching walls. Philip was the strongest early advocate of gunpowder weapons, encouraging experimentation with different sizes, gunpowder mixtures, and metals. Soon bombards weighing twenty tons and firing 1,000-pound balls were bringing sieges to quick conclusions across Europe.

Development

Fifteenth Century

By 1410 gunpowder weaponry had captured the attention of an unlikely commentator on military affairs, Christine de Pizan (c. 1365-c. 1430), a native of Italy who lived most of her life at the French court. Her *Le Livre des fais d'armes et de chevalerie* (1410; *The Book of Fayttes of Arms and of Chivalry*, 1489) discusses at length the use of the cannon as a siege weapon, recommending that the defenders of a fortification use twelve cannons using stone balls and ten pieces of mechanical artillery. Christine estimated the need for 1,500 pounds of gunpowder along with 200 stone balls and argued that attackers would need a much larger arsenal: forty-two cannon shooting

Turning Points

1331	First known use of gunpowder weaponry occurs at the Siege of Friuli in Italy.
1377	Cannon are first used successfully to breach a wall at the Siege of Odruik, the Netherlands.
1420	Hussite leader Jan Žižka makes innovative and effective use of firearms, with the *Wagenburg*, a defensive line of wagons and cannons.
1525	Spanish Square formation of pikemen and harquebusiers is perfected at the Battle of Pavia.
1631	Gustavus II Adolphus's military reforms prove their value at the Battle of Breitenfeld.

200-pound balls, along with many mechanical artillery pieces and smaller firearms. Attackers would also need 30,000 pounds of powder, 1,100 stone balls, and 500 pounds of lead for the smaller pieces, because working stone into balls small enough for these weapons was difficult and time-consuming. Christine also advocated mounting cannon on ships for war at sea.

The fact that Christine's work makes little mention of gunpowder weapons in battle suggests that, at least in France, they were not yet being widely used. In Flanders, ribaulds were placed on carts and used as field artillery. The first battle in which they had an impact was Beverhoudsveld (1382) in the Netherlands. The militiamen of the city of Ghent had some two hundred carts with several ribaulds apiece in the battle against the count of Flanders. Concentrated ribauld fire against the count's men as they charged caused them to panic and flee. These carts were difficult to move, and later the same year Ghent was defeated when its forces charged the enemy only to find that the ribauld carts could not keep up, depriving them of supporting fire at the crucial moment.

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A hand-cannon of the fifteenth century, fired from the shoulder or from a rest such as a wall with a lit match.

The solution was the development of handguns small enough to allow their bearers to move with the rest of the army. The first evidence for such weapons is found in an illustration from around 1400, which shows a soldier holding in one hand the breech end of a long narrow tube that rests on a tripod at the muzzle while he applies a burning stick to the touchhole. This device appears to be so clumsy that it was most likely used not in the field, but rather as a siege weapon. Walls provided a base on which to steady the weapons, and hooks attaching them to the walls absorbed much of the force of the recoil. Recoil was a serious problem in early handguns, which required two hands to use: one to hold either the burning stick or the match that appeared around 1420, and the other to hold the piece. Consequently early handguns were butted up against the middle of the user's chest, often resulting in a broken breastbone. The first hook guns probably were used in the Hussite Wars (1419-1434), an anti-Catholic revolt against King Sigismund of Bohemia (1368-1437). To counter the knightly forces of Sigismund, Hussite leader Jan Žižka (c. 1360-1424) devised the *Wagenburg*, a defensive line of wagons on which were placed men with firearms. Between the wagons, cannons were stationed. Men on horseback presented a large target for the gunpowder weapons in use, inaccurate as they were. These weapons had the additional advantage of frightening the horses with their smoke and noise. Even after Žižka's death, the Wagenburg continued to help the Hussites to victory over German knights. German efforts to replicate the Wagenburg failed, but Hussite hook guns appeared in Germany, where the German word for them is regarded as the source for the word "harquebus," used as the name for the first effective firearm.

The harquebus was a product of several German innovations that had been made by 1460. Corned, or granulated, powder provided greater explosive

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The harquebus, popular by the sixteenth century, had a matchlock firing device that allowed for more reliable firing.

power than had earlier powder and produced higher muzzle velocities. Gunsmiths found the right compromise between ballistic performance and weight by using barrels of about 40 inches in length. Another major innovation was the match: a piece of string soaked in saltpeter that burned slowly but with a tip hot enough to touch off gunpowder. The match replaced the burning stick, which was both clumsy and unreliable. The match, however, created the same problem for its users as had the burning stick: It had to be held in a hand and touched down into the chamber to fire the powder, leaving only one hand to hold the piece. The solution was the matchlock, which brought together springs, a trigger, and a clamp for holding a smoldering match. When the trigger was pulled, the burning tip was thrust into the powder and touched it off. The shoulder stock, borrowed from the crossbow, reduced the impact of the recoil. The users of the matchlock device found that although overly coarse powder failed to be ignited by the match, overly fine powder created too forceful a recoil. The solution was the placement of a small pan behind the chamber of the barrel, into which fine powder was placed. Coarse powder was then put in the chamber. The match touched off the fine powder in the pan, blowing flame through a hole into the chamber, igniting the coarser powder there, and firing off the ball.

The harquebus's impact on the battlefield was slow to appear. Compared to longbows, the early harquebus performed poorly in its reliability, rate of fire, and accuracy. It found its first niche as a siege weapon, replacing the crossbow. Firearms were useful weapons for the militiamen who guarded the city walls across Europe. They did not require much training to be used effectively on walls, and the artisans and merchants who made up the urban militias could afford them. The earliest mentions of the harquebus appear in the weapons inventories of cities.

For a brief time, the use of the harquebus as a defensive weapon on walls reduced the advantage that heavy cannons had provided besiegers, but gunpowder artillery continued to improve more rapidly than did firearms. A problem with early cannons was the poor quality of cast iron used to make them, which resulted in pieces frequently bursting and killing gunners and bystanders. A solution was the use of bronze. Europeans were familiar with casting bronze bells, and that technology was easily transferred to the making of weapons. The use of bronze allowed founders to manufacture long-barreled pieces with small muzzles, which were capable of using iron or lead balls. Under Charles VII (1403-1461), the French led the way in developing high-quality cannons. The final years of the Hundred Years' War (1337-1453) saw dramatic improvements in the royal artillery train. Charles's masters of artillery organized a system of manufacturing cannon, procuring gunpowder and shot, and hiring gunners that

R. S. Peale and J. A. Hill

The Battle of Pavia (1525) between forces of French king Francis I and Holy Roman Emperor Charles V.

played a significant role in reducing English-held locations in Normandy and Gascony. In the war's last major battles, Formigny (1450) and Castillon (1453), the French placed their guns all along the line of battle, routing the English. The king also promoted experimentation to improve the gun carriage, leading to the creation of the carriage with high wheels and long tail that defined gun carriages until the nineteenth century. Using an artillery train of around eighty bronze cannon on mobile carriages, Charles VIII (1470-1498) had great success in reducing Italian fortifications during the initial phase of the Italian Wars of 1494-1559. In the Battle of Fornovo (1495) the French artillery also played a role as a field weapon.

SIXTEENTH CENTURY

During the wars in Italy after 1494, field armies began to include harquebusiers. At the Battle of Cerignola (1503) in the French-Spanish War over Naples, the Spanish commander Gonzalo Fernández de Córdoba (1453-1515) devised a way to make effective use of harquebusiers by digging trenches in front of their lines. This action transformed the battlefield into a fort and imitated a siege, a situation in which the harquebus had long proven itself. Harquebus fire raked the French forces as they approached the Spanish trenches. Over the next twenty years the Spanish infantry was victorious as long as it had the time to dig entrenchments and the French and their Swiss mercenaries relied on frontal assault. At the Battle of Pavia (1525) the combination of harquebusiers and pikemen in the army of Holy Roman Emperor Charles V (1500-1558) formed without entrenchments and defeated the French. This infantry formation, in which pikemen and harquebusiers provided mutual support, was known as the Spanish Square.

During the Dutch Wars of Independence (1566-1648), Maurice of Nassau (1567-1625) made his infantry more effective by extensive drilling, which had special success in improving his handgunners' firepower. He broke down the process of loading and firing a matchlock firearm into forty-two steps; each step had a word of command shouted by the sergeant. Drill books showing the steps and providing the words of command spread across Europe. Gustavus II Adolphus (1594-1632) of Sweden built upon the Dutch system, emphasizing drills and increasing the rate of fire from firearms by providing a cartridge with a ball and a measured amount of powder. Intent on increasing firepower for his forces, he also introduced a light piece firing a 3-pound ball that could be moved with the infantry on the battlefield, thereby providing support fire for the infantry in a way that heavier cannon could not do. For Gustavus II Adolphus, the purpose of firepower was to create opportunities for shock forces to carry the attack into the ranks of the enemy. Pikemen continued to be a significant part of the European infantry until the development of the bayonet by 1700 combined shock and firepower in each soldier.

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Frederic J. Baumgartner

Knights to Cavalry

Dates: c. 1000-1600 C.E.

Knights

Although the roles of knights and cavalrymen are often confused, the two are actually different. Knights were mounted warriors who fought as an aggregate of individuals; cavalry were tactical bodies of horsemen who fought as a cohesive unit. Knights, who dominated the battlefields of central and western Europe from the eleventh to the fourteenth centuries, were identified by their horses, armor, and weapons. Although it was not a violation of the knightly code for knights to fight on foot, knights generally fought on horseback, wearing armor, and engaged in hand-to-hand combat using couched lances, broadswords, and other shock weapons, such as maces. Knights' proper opponents were other knights, not the ill-disciplined and badly armed infantrymen who accompanied medieval armies.

The usual knightly tactic was the frontal charge, with the horsemen forming up in a line and riding toward the enemy's line, reaching a full gallop some 30 to 40 yards before colliding with the enemy. Unless one foe was badly inferior in number or morale, allowing the line to be broken, hand-to-hand combat ensued in the melee after the two lines collided, where individual combatants were nearly identical in equipment, strength, and training. The knights spent little time drilling together. Imbued with the old Germanic tradition that the best warrior led the others into battle, the knights competed to be the first into battle, making it difficult for commanders to coordinate simple tactical moves such as flanking maneuvers before the knights rode off to charge the enemy.

For all of their deficiencies, knights proved their mettle against Byzantine and Muslim forces, and for nearly 250 years after the Battle of Hastings (1066) they were all but invulnerable to the weapons used by European infantrymen. At the Battles of Courtrai (1302) in the Franco-Dutch War and the Morgarten (1315) in the First Austro-Swiss War, however, Flemish and Swiss pikemen demonstrated that the proper choice of terrain allowed resolute foot soldiers to defeat French and Austrian knights respectively. By then the use of powerful crossbows and longbows also put knights at greater risk of death on the battlefield at the hands of commoner bowmen. The combination of archer and dismounted knight used by the English throughout the Hundred Years' War (1337-1453) proved deadly effective against French knights. Men-at-arms responded to their new vulnerability by using plate armor for themselves and their horses, which were more likely than their riders to be killed in battle. Plate armor presented several problems. It was too expensive for the less wealthy nobles, so that the

Turning Points

1302	Flemish pikemen defeat French knights with advantageous choice of terrain at Courtrai.
1420	Hussite leader Jan Žižka stymies German knights during the Hussite Wars with his *Wagenburg*, a defensive line of wagons and cannons.
1503	Spanish infantry using Spanish Square formation of pikemen and harquebusiers defeat French knights at Cerignola.
1544	At Cerisolles, French knights fighting in the traditional style play a major role in gaining victory over the Swiss, the last battle in which they are to do so.
1562	The caracole maneuver is first executed by Huguenot pistolers against Catholic forces at the Battle of Dreux.
1631	Disciplined cavalrymen combine firepower and shock tactics at Breitenfeld.

Library of Congress

Medieval knights face a massed infantry pike formation, against which, in their heavy armor astride their large, unwieldy horses, they became less and less effective.

near equality in knightly equipment that had marked the previous era disappeared. Its weight required larger and more costly warhorses, which were slower and less maneuverable, allowing the men-at-arms to do little more than a straight-ahead charge. Despite defeat by the Swiss infantrymen in numerous battles throughout the fifteenth century, culminating at Nancy (1477) in the death of Charles the Bold (1433-1477), the duke of Normandy, armored horsemen remained a potent element, especially in the French army.

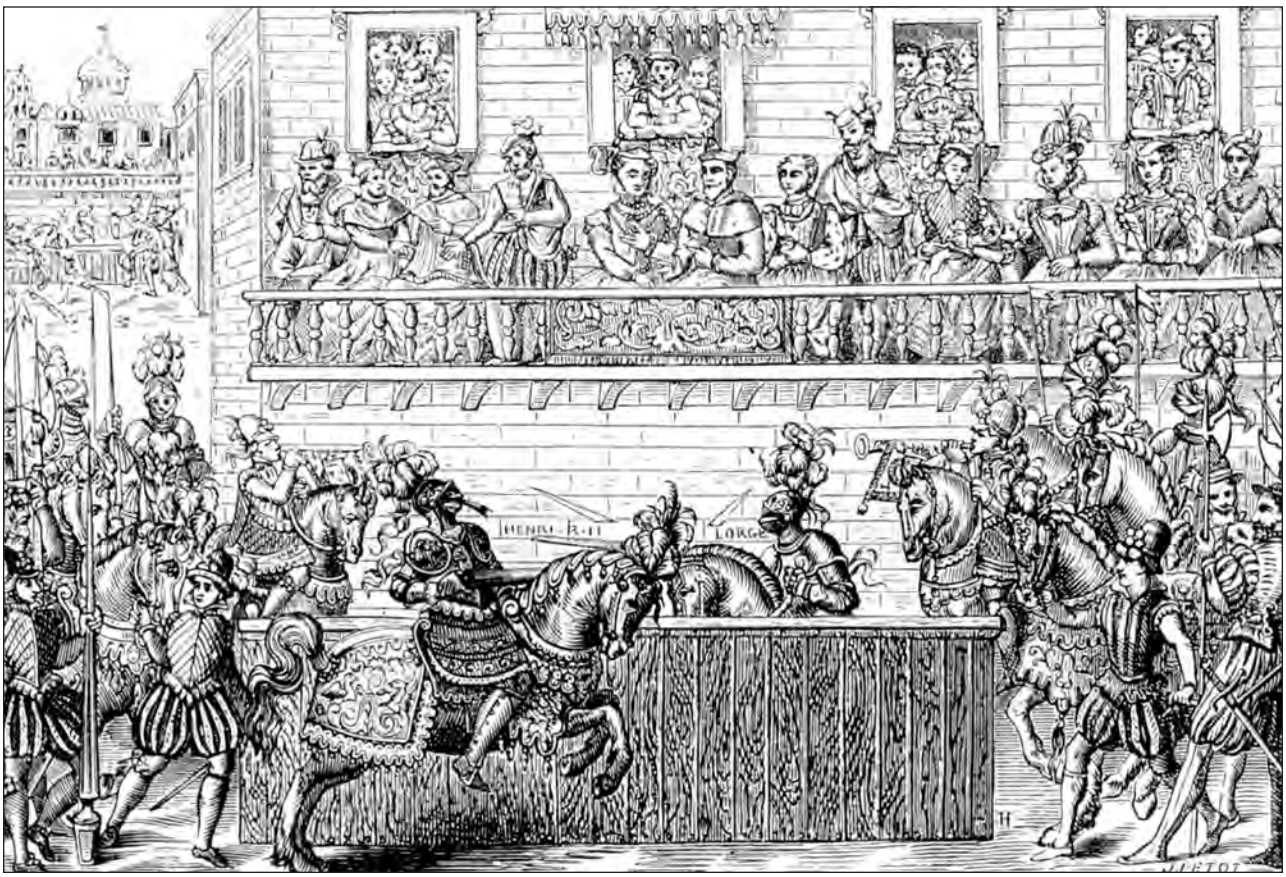
IMPACT OF GUNPOWDER WEAPONS

The development of gunpowder weapons after 1325 did little to change warfare for 150 years. Their first niche was in siege warfare. During the Hussite Wars (1419-1434) in Bohemia, Hussite leader Jan Žižka (c. 1360-1424) successfully brought the siege to the battlefield using the *Wagenburg*, which copied a fort by placing firearms and small cannon on wagons drawn up in a defensive line. Žižka's Wagenburg stymied the German knights who were his enemy in the war, but the tactic did not spread beyond Bohemia. The new weaponry, including both firearms and artillery, was too inaccurate, slow to reload, and clumsy to use on the battlefield to be effective against men-at-arms, although its ability to pierce plate armor increased knightly casualty rates.

During the Italian Wars of 1494-1559, which began in 1494 when French king Charles VIII (r. 1483-1498) led an army of 8,500 horsemen across the Alps, the men-at-arms continued to have a significant place in battle. At Seminara (1495) the French men-at-arms crushed the Spanish and Italian horsemen and then routed the enemy infantry by attacking its flank and rear. Faced with the need to reform his army after its crushing defeat, Ferdinand II of Aragon (1452-1516) decided to concentrate on the infantry, introducing the combination of firearms and pike that became known as the Spanish Square. This formation demonstrated its potential against the French men-at-arms at Cerignola (1503), when well-

entrenched infantrymen using harquebuses and pikes held off their charge and killed the French commander with a harquebus ball as he rode toward their line. The men-at-arms had their victorious moments, most notably at Marignano (1515), where they had a major role in the French victory over the Swiss. The last battle in which French men-at-arms using their traditional fighting style had a significant role in gaining victory was Cerisolles (1544) in northern Italy. Their foe, a Spanish and German force serving Holy Roman Emperor Charles V (1500-1558), placed too much faith in the ability of harquebusiers to withstand a cavalry charge without support from pikemen. The harquebusiers could not sustain fire strong enough to halt the men-at-arms as they charged through the balls into their ranks.

France was the last place in Europe where knights continued to be used as a major part of the army. This tradition reflected the attitude of the French nobles, who regarded fighting on horseback as their God-given right. The Spanish had never developed much of a force of armored horsemen because their principal foe through the Middle Ages had been the light cavalry of the Moors and because Spanish agriculture was incapable of breeding many of the heavy horses the knights required. The English had been using armored men as heavy infantry since conquering Wales in the thirteenth century. English ability to deploy armored men on horseback was severely limited by the lack of heavy horses. The Italians had used men-at-arms as their principal fighting force until 1494, but one consequence of the Italian Wars of



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French king Henry II is mortally wounded in a joust the year of the treaty between France and Spain that ended decades of war between the two countries.

1494-1559 was a rapid decline in that system. A city such as Venice would keep some armored horsemen under arms until late in the sixteenth century, but this practice was more for the appeasement of its noble class than for any practical value the knights had on the battlefield.

The Pistol

The final challenge to the traditional man-at-arms appeared in Germany. German knights had continued to appear in war until 1540. Then, within a decade, the pistoler replaced the knight. The wheel-lock mechanism for the pistol was developed about 1505 in either Germany or Italy, but it evolved into the pistol first in Germany. By 1518, Holy Roman Emperor Maximilian I (1459-1519) had banned weapons small enough to be concealed in one's sleeve. The production of the wheel lock was a time-consuming task that required much smaller tolerances than the matchlock used in the harquebus did. Because the wheel lock had to be sturdy enough for use in a weapon, it was very expensive. Cost probably was the principal reason the pistol did not become a weapon for foot soldiers, although some wheel-lock muskets were made.

The nobles, who still insisted on their right to fight on horseback, found that the pistol could be effective from horseback, especially if they carried three or four of them, which could be loaded in advance, placed in slings or in their boots, and fired in rapid succession. The wheel-lock pistol was badly inaccurate at any distance beyond a few paces and only more so when fired from a moving horse. However, a horseman firing three or four pistols rapidly could have some hope of hitting a foe. The pistol was a one-handed weapon, which allowed the rider a free hand to control his horse. Although there had been mounted harquebusiers in most European armies since 1500, the sparking match of the harquebusiers' two-handed weapons frightened their horses, and the harquebusiers usually dismounted to fire. Pistols offered many benefits: Pistolers could shed much of their armor, making their mobility the key to what success they had; their horses could be smaller and cheaper; and it required less training to use a pistol than a lance.

Mounted pistolers first appeared in the war between Charles V and the Lutheran princes in Germany (1546-1555). When they served in Charles's army that fought the French for control of Lorraine (1553-1554), the French called them *reîtres*. The French men-at-arms were astonished when a force of reîtres little larger than their own band defeated them at Saint-Vincent in Lorraine (1553). The forces of Spanish king Philip II (r. 1556-1598) had great numbers of reîtres at the Battle of Saint Quentin (1557). Their speed played a major role in the deadly pursuit of the routed French forces. French king Henry II (r. 1547-1559) then recruited eight thousand reîtres for the French army. In the French Wars of Religion that followed Henry's accidental death while jousting (a further blow to the traditional style), the Protestant army had the larger number of reîtres, because most were Lutherans.

The Caracole

In the Battle of Dreux (1562), between the Protestant Huguenots and the Catholics, the Protestant pistolers for the first time executed the tactic known as the caracole. The reîtres rode toward their enemy's line in successive ranks, fired their pistols a few yards from the foe as they wheeled their horses about, and returned to the rear of their formation to reload and wait their turn to repeat the maneuver. The caracole had success against an infantry force armed only with shock weapons, but it was ineffective against a well-equipped force of harquebusiers, who had greater range. The caracole was more successful against the men-at-arms because reîtres could rely on greater speed to keep clear of their shock weapons. In 1568 Marshal Gaspard de Tavannes (1509-1573), the royalist Catholic commander, ordered that each company of horsemen would ride together in the formation it would take on the battlefield, so that men would become accustomed to holding their positions, a clear statement of the change from the knight to the cavalryman. The pistolers formed up in depth, while the knights charged in a line one or two ranks deep. To be effective in their deep formation, reîtres required more organization, drill, and training than did knights. Cohesion in their units was more crucial to what success they had on the battlefield. François

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The values—and limitations—of the caracole maneuver were demonstrated in the Battle of Dreux in 1562.

de La Noue (1531-1591), a Protestant captain, noted with distaste in his *Discours politiques et militaires* (1587; *The Politicke and Militarie Discourses*, 1588) that pistolers could defeat noble men-at-arms if they kept tight order and discipline.

By the time Henry IV (r. 1589-1610) became the French king, the pistol had largely replaced the lance in France. Henry regarded shock tactics as necessary, and he had his horsemen charge into the ranks of the enemy with swords after they had fired their pistols. The greater discipline in Henry's cavalry units made them effective in hand-to-hand combat. During the Dutch Wars of Independence (1566-1648), Maurice of Nassau (1567-1625) ordered his horsemen to abandon the lance entirely. When Gustavus II Adolphus of Sweden (1594-1632) went to war with Poland (1617-1629), he found that his pistolers lacked the discipline and training to counter the powerful Polish lancers, who still fought largely in the traditional style. The scarcity of firearms in eastern Europe meant that horsemen there had not increased the weight of their armor and thus were still mobile and effective. Although he allowed his horsemen to fire a pistol as they closed on the enemy, Gustavus reemphasized shock tactics using the sword. However, he also demanded that his horsemen drill extensively so that they would fight as a cohesive unit. In battles of the Thirty Years' War such as Breitenfeld I (1631), he demonstrated the success of his ideas and completed the transition from knight to cavalry.

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Frederic J. Baumgartner

Galleys to Galleons

Dates: To c. 1600 C.E.

The Medieval Galley

The history of medieval naval warfare is the history of the galley. Since ancient times, battles at sea have taken place largely on the decks of ships and were fought much like land battles, with hand-to-hand combat. Medieval naval battles usually followed a similar pattern. First, smaller, more maneuverable ships would pin down the enemy fleet. Then the larger, more heavily armed galleys would attack, initially firing missiles and then ramming or grappling the enemy vessel in order to board it. Blasts of lime were often fired to blind the enemy and were then followed by volleys of stones. One of the most dreaded tactics was to fling onto the enemy ship what was known as Greek fire, a substance that, once ignited, was inextinguishable in water. Crossbows, lances, bows and arrows, and, by the late Middle Ages, guns and cannons served as well at sea as on land. However, the ship itself was the most powerful weapon, often determining the outcome of a naval battle. The warship at sea was likened to the warhorse on land and, like the warhorse, the warship was bred for fighting.

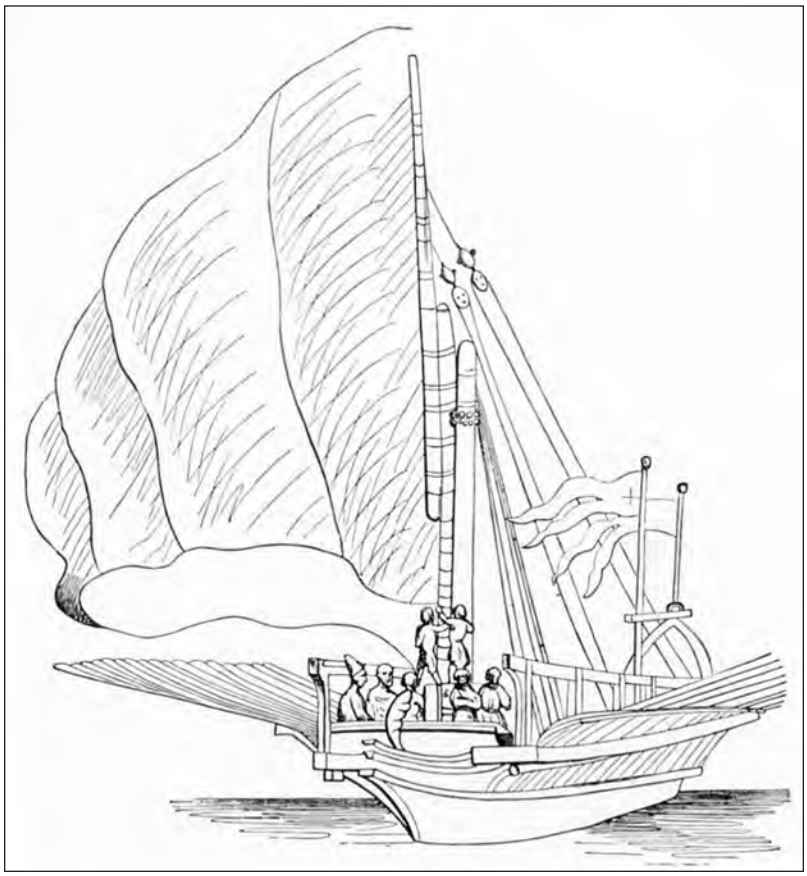
Equipped with sails for distance and oars for maneuverability, the medieval galley was ideally suited for the purpose of war. Medieval variations on the classical galley were many. The *dromon*, developed by the Byzantines, was a large galley that utilized one or two tiers of oars, a square sail set on a single mast, and a stern-hung rudder. In times of war, the dromon could carry troops, weapons, supplies, and cavalry horses, as well as engage in sea battles when necessary. The beam of the dromon permitted mounted cannons in the bow of the ship, which could be fired directly ahead of the vessel. A variation on the dromon was the Italian galley, which had one level of oars with two or three oarsmen to each rowing bench, a total of approximately 120 oarsmen. The Italian galley was manned by about fifty soldiers and typically had a large catapult mounted on a platform on the front deck.

The galleas was another variation on the galley. Developed by the Venetians, the galleas had a gun deck, oars, and two to three masts. The triangular lateen sails, adopted from those of the Arab dhows, permitted the galleas to sail nearly straight into the wind, impossible with square sails. Sailors armed with crossbows and lances could fight on the ships' decks.

Turning Points

674-678	Greek fire, a flammable liquid, is used by the Byzantines against Arab ships during the Siege of Constantinople.
mid-13th cent.	The cog, with high sides that offer protection against other vessels, is developed in Northern Europe.
mid-14th cent.	The carrack, an efficient sailing ship with multiple masts, becomes popular in Atlantic and Mediterranean waters.
1501	The development of gunports allows a ship's heaviest guns to be mounted on its lowest decks, stabilizing its center of gravity.
1571	The Battle of Lepanto II, fought between the Ottoman Turks and the Christian forces of Don Juan de Austria, is the last major naval battle to be waged with galleys.
1588	The English employ galleons to individually attack the larger ships of the formidable Spanish Armada, defeating the Spanish and revolutionizing naval tactics.

The last major naval battle in which galleys were employed was the Battle of Lepanto II, fought off the coast of southwestern Greece on October 7, 1571, between the Ottoman Turks, under the command of Ali Paşa (died 1616), and the Christian forces, under the command of Don Juan de Austria (1547-1578), half brother of King Philip II of Spain (1527-1598). The Turks' 273 ships (210 were galleys) and the Christians' 276 ships (208 were galleys) faced off in long lines across from one another, with the Christian forces hemming in the Muslim forces. Don Juan skillfully placed his most heavily armed galleys in the center of the line and his smaller, more maneuverable galleys on the outside, where they could dominate the flanks. The massive and heavily armed Christian galleys eventually triumphed over the lighter and less armed Arab ships, giving naval supremacy to the Christian forces in the Eastern Mediterranean. The Battle of Lepanto was the last major naval battle in which galleys were employed, and it was the first major naval battle in which guns and gunpowder played the decisive role. From this point on, guns and cannons would be increasingly important in naval warfare.



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A sixteenth century galley, forerunner of the galleon, in an engraving by Raphael.

Although the galley was the vessel of choice in the Mediterranean Sea for more than four millennia, it was a typically unstable ship, particularly in rough waters. Maneuverability during battle was provided by oars, rather than by the sails, which had to be lowered during battles to prevent the enemy from tearing or setting fire to them. Despite their shortcomings, however, various forms of galleys continued to be employed in the Mediterranean until 1717 and in the Baltic Sea until 1809. In an effort to produce a more seaworthy craft, medieval shipbuilders turned to other designs for seagoing vessels.

THE COG

Developed in Northern Europe as a trading vessel, the cog was one step closer to the first true full-rigged ships, which relied on sails, rather than oars, for both distance and maneuverability. The cog was clinker-built, of overlapping planks. It had a broad beam, a rounded bow and stern, fore- and aft castles, and a single square sail hoisted on a yard. The castles were constructed primarily as high platforms for lookouts and archers and were useful in sea battles. Lower, oar-driven ships found it nearly impossible to conquer a taller ship due to its sheer height and to the superior positioning of its archers and fighting men. The cog was maneuvered by a rudder, attached like a hinge at the center stern and manipulated by a tiller.

This steering system was a great technological advance, and it remains the basic means of control on ships.

The principal purpose of the cog was for commerce, but when enemies or pirates threatened, the cog became a warship. In 1234 and again in 1239, the Baltic German city of Lübeck, a central member of the Hanseatic League, sent a fleet of cogs against the king of Denmark when he threatened to take over the city. After pirates invaded the Mediterranean in 1304, the Genoese and Venetians began to use cogs in their navies. A psalter dating to 1330 depicts two cogs in a battle, with the soldiers engaged in hand-to-hand combat across the decks of the ships.

In naval battles the primary goal was not the sinking of the enemy's ship; in fact, it would have been considered foolish to sink a vessel that had been so expensive to construct. In 1340, during the Hundred Years' War, King Edward III of England (1312-1377) sailed in a cog to lead an English fleet of 250 vessels into battle against the French fleet anchored at Sluys, off the coast of Flanders. Although outnumbered, Edward was able to defeat the French fleet and capture 190 French ships. His chronicler estimated that Edward saved 200,000 florins in shipbuilders' wages.

By the fourteenth century cogs sailed the throughout the Mediterranean and the northern European seas. The cog was not without its shortcomings, among which were its inability to keep cargo dry and its insufficient leeway to allow navigation in shallow waters. As trade, exploration, and military challenges increased, so too did the need for more capable and seaworthy vessels.

F. R. Niglutsch

An engraving of the Christian fleet's defeat of the Muslim Ottomans at the Battle of Lepanto, the last major naval battle in which galleys were employed.

THE CARRACK

From the fourteenth to the seventeenth century, a larger vessel called the carrack was the predominant trading vessel in Europe. The carrack combined the square sails of the northern ships with the lateen sails of the Mediterranean ships, along with three masts, a stern rudder, and very high fore- and aft castles, producing a vessel noted for its large cargo capacity and its ability to traverse great distances. Improvements in maps and charts greatly improved navigation, especially in the Mediterranean. Written sailing instructions called portolan charts described coastlines, ports, and dangerous sailing areas, and also provided information regarding the availability of supplies for seafarers.

These charts aided sailors by mapping coastlines, marking locations of cities, and stating sailing distances.

Although primarily used in trade, the carrack was also employed in war. The English carrack HMS *Mary Rose* was built in 1510 as a ship of war. Like other warships of its day, the *Mary Rose* had gunports with large guns mounted in its hull. Although the date of the first ship gunport is debated, it was most likely first developed by a Brest shipbuilder named Descharges in about 1501. The *Mary Rose* may have been the first of King Henry VIII's (1491-1547) ships to be equipped with gunports, perhaps installed when the *Mary Rose* was renovated in 1536. The guns on board the *Mary Rose* were cast of iron and bronze, with the heaviest guns mounted on the lowest deck in order to stabilize the ship's center of gravity. The *Mary Rose* carried a variety of guns, from smoothbore barrel guns to oddly bored scatter guns. The low placement of the gunports, however, combined with the sheer weight of its eighty guns, led to the sinking of the *Mary Rose* when it was sent against the French on July 19, 1545, in a battle off Spithead, taking its crew and its captain, Roger Grenville, as well as the vice admiral, Sir George Carew, down with her.

Frederick Ungar Publishing Co.

A galleon called a man-of-war, or combatant warship, from the sixteenth century.

THE GALLEON

The development of the galleon marked the turn from medieval to modern naval warfare. Designed in the sixteenth century by the admiral in charge of the Elizabethan navy, Sir John Hawkins (1532-1595), the galleon surpassed all previous ships. It was an adaptation of the carrack, eliminating the high forecastle to produce a ship with a lower profile and therefore with far better performance, particularly when sailing into the wind. This improved carrack design reached Spain about seventeen years after its introduction in England, and the result was the development of the Spanish war galleon. Within forty years, the galleon replaced the carrack as both the primary trading vessel and warship. For three centuries, the galleon ruled the world's seas.

Galleons differed from carracks in more than the absence of the high forecastle. On the aft was typically a quarterdeck instead of a deck-mounted aft castle. Gunports lined one or both of the main decks, and special, smaller decks served as fighting platforms. A galleon's hull was longer, narrower, and sleeker than that of a carrack. The result was a ship designed for speed, maneuverability, seaworthiness, and, especially, warfare.

By the late sixteenth century, commercial and religious rivalry between Catholic Spain and Protestant England brought the two countries to the brink of war. Spain, confident of its maritime supremacy, made the first move. In May, 1588, the Spanish Armada, assembled by King Philip II of Spain and un-

der the command of the duke of Medina-Sidonia, Alonso Pérez de Guzmán (c. 1550-1619), sailed out of Lisbon harbor en route to the Low Countries to pick up the prince of Parma and his forces. Their goal was to invade England. The Spanish fleet consisted of 130 ships of varying sizes and types, the majority of which were galleons. Meanwhile, the English prepared for the Spanish invasion by dividing the English navy between Plymouth, with 94 ships under Charles Howard of Effingham (1536-1624), and Dover, with 35 ships under Lord Henry Seymour.

After heading into the English Channel, the Spanish positioned their ships in a crescent formation, which the smaller English ships could not break. The English turned this to their advantage by attacking the larger Spanish ships individually at close firing range. When the Spanish fleet anchored at Calais on July 27 to wait for the prince of Parma and his forces, the English sent in small fireships to attack the anchored Spanish vessels. The Spanish were forced to cut their lines and sail out into the bay, where they were met by the combined forces of Howard and Seymour. The Spanish Armada retreated to Spain with only 67 of its original 130 ships.

The difference between the Spanish loss and the English victory lay in the strategy of each. The Spanish relied on the traditional warfare technique, used since ancient times, of coming alongside and boarding enemy ships to engage in hand-to-hand combat. The English, however, did not attempt to board the enemy ships, but rather attacked them downwind at close range, disabling as many as possible. This was an important turning point in naval history. The naval tactics that were first employed by the English against the Spanish Armada continued in use in naval warfare from that point forward.

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Sonia Sorrell

WEAPONS AND FORCES

Swords, Daggers, and Bayonets

Dates: c. 1500-1900

Nature and Use

Edged weapons, such as swords, daggers, and bayonets, are the oldest and most basic instruments of warfare in continuous use since prehistoric times. The use of edged weapons, such as the combat knife, is still taught in basic military training, and the sword, though rendered a military anachronism after the introduction of the repeating rifle, retains a place of honor in formal military dress and ceremony. Both Western and Eastern sword-fighting techniques continue to be studied as martial art forms.

The dagger is arguably the oldest form of edged weapon, being simply a utilitarian knife adapted for service in combat. In its most basic form the dagger consists of a pointed blade, most often of forged metal, although stone, antler, bone, and hardwood have also been used, usually measuring between 6 and 20 inches in length, set into a handle and sharpened to a cutting edge along one or both sides. From this elemental form evolved, by simple extension of the blade length, the various forms of short sword and, later, the long sword. After the introduction of practical firearms in the late seventeenth century, an adaptation of the dagger resulted in the creation of the bayonet, which allowed an empty or fouled musket to be quickly and easily transformed into a serviceable pike by the simple expedient of ramming the dagger's round handle into the muzzle.

Among the most familiar forms of dagger is the bowie knife, named for the American frontiersman Colonel James Bowie of Alamo fame (1796-1836), but actually designed by Bowie's brother, Rezin. The bowie knife's distinctive straight-backed blade is clipped along the top edge into a shallow concave curve at the end, thus imparting a double cutting edge to the point. Equally distinctive is the Sykes-Fairbairn commando dagger, widely used by British paratroopers during World War II; its elegant symmetrical blade was inspired by an ancient Egyptian pattern. Also developed during World War II, the Ka-Bar combat knife, known also as the Mark II in the U.S. Navy and as the Mark III in the U.S. Army and U.S. Marines, employs a variant of the clipped bowie blade. In hand-to-hand fighting, the Ka-Bar is gripped like a hammer in the right hand, while the splayed left hand is held pressed against the chest to protect the heart.

Distinctive non-Western dagger forms include the Malay kris, with a long slender blade, often ground to a wavy edge along its length, that widens to an asymmetrical spur near the handle; the *kukri*, a general-purpose long dagger in use by the Gurkas of Nepal since the nineteenth century with an obtuse "bent" blade that is sharpened along its inner edge; and the East Indian *katar*, a triangular punching dagger with a handle that is mounted at right angles to the long axis of its blade.

Turning Points

c. 1200	As forged steel processes are refined, several European cities, including Sheffield, Brussels, and Toledo, emerge as swordmaking centers.
1450-1700	Sword blades become lighter, narrower, and longer, gradually evolving into the familiar rapier design.
c. late 16th cent.	Japanese swordmaking techniques reach a peak of sophistication, with a variation of the hammer-welding process.
1846-1848	Although military swords have entered a period of decline, cavalry sabers prove decisive during the Mexican-American War.

The earliest forms of sword are virtually indistinguishable from long daggers, a case in point being the ancient Roman *gladius*, a standard weapon of the Roman legions, which measured a modest 2 feet in length.

DEVELOPMENT

Blades of great antiquity, such as those from Mesopotamian and Egyptian cultures dating from 3000 B.C.E., are often short in length, a characteristic necessitated by the use of bronze, which lacks the material strength to produce long serviceable blades. Following the development and subsequent refining of forged steel processes around 1200 C.E., several European cities emerged as respected centers of sword blade production during the late medieval era. Principal among these were the smiths of Sheffield, Brussels, Paris, Nuremberg, Augsburg, and, most respected of all, those of Toledo.

The whitesmith, as the sword maker was known, created a blade from a mass of smelted wrought iron, called a "bloom," by repeatedly heating it and hammering it flat upon an anvil. Through successive repetitions of this procedure, particles of carbon were mixed with the iron, turning it into hardened, carburized steel. Early sword blades were steeled only along their cutting edges, their inner cores composed of the relatively softer and more flexible iron. A technique called pattern welding was later devised to combine the advantageous flexibility of the soft iron core with the harder, but also more brittle, edge-taking quality of hardened steel.

In the pattern-welding process, slender rods of iron are twisted together, heated, and hammer-welded into flat bars of harder carburized iron, which are then sharpened to form the cutting edge. The pattern-welded blade reveals a characteristic serpentine effect upon its surface that persists even in the polished blade. Pattern welding was known to Roman sword makers of the Pax Romana, or Roman Peace (c. 27 B.C.E.-180 C.E.), as well as to the later Vikings. The word "damascene," literally "of Damascus," is often incorrectly used as a synonym for the pattern-welding technique; more properly the term refers to the mottled surface characteristic of blades from Syria and Persia, common after the tenth century. The metal in these blades was repeatedly heated and folded during the hammer-welding process, creating laminated layers of alternating high and low carbon content metal.

Weapons of superior quality bore recognized trademarks, such as that of a running wolf for the arms makers of Solingen (in the Ruhr Valley), which were sometimes fraudulently copied by lesser craftsmen. The legendary Spanish blades of Toledo especially inspired many German and Italian emulations.

Until the mid-1400's, most swords were straight-bladed, double-edged weapons, widely thought to have been too heavy and poorly balanced to allow for the development of elaborate fencing techniques. However, it has been noted that many of these older swords are surprisingly well balanced and of sufficiently light weight—most averaging around 3 pounds—to allow a well-conditioned hand to wield them with surprising dexterity. During the period from 1450 to 1700 blades gradually became lighter, narrower, and longer, developing into the familiar rapier design associated with the musketeers of Louis XIII (1601-1643). These rapiers eventually evolved into the light, fast-dueling swords of the seventeenth and eighteenth centuries, whose basic form still survives in the fencing foil and the épée: slender pointed swords of, respectively, rectangular and triangular cross-section that feature shorter blades, typically 32 inches or less in length.

The shape of the sword's blade dictates the type of attack for which it is used. The curved Persian scimitar, introduced to Europe by the Turks during the Crusades and widely emulated in the European cavalry saber, was more suited for a downward hewing attack or a forward cut-and-thrust motion. In contrast, the narrow thrusting blade typical of most sixteenth century dueling swords was thought to provide a distinct tactical advantage, because the linear thrust is a quicker and more direct motion than the curving slash. Moreover, the thrusting blade was regarded as more lethal, because piercing wounds to the torso were more likely to prove fatal than slash wounds to the same area. Blades ground to a wavy *flamberge* edge, which increased the length of the

actual cutting edge, were thought to inflict more damaging and more painful wounds.

In its most general form the sixteenth century sword was cruciform in shape and consisted of a straight or curved steel blade, designed principally for cutting and sharpened along one or both edges. Along the length of the blade might be a narrow groove, technically called a fuller but more popularly known as a "blood groove," intended to reduce the overall weight of the blade and, at the same time, impart to it added strength and flexibility. The sword's cutting edge extended forward from the *ricasso*, that portion of the blade just beyond the cross guard. Extremely long swords, such as the *espadon* or the Scottish claymore (or *claidheamh-mor*, literally, "great sword"), often feature a longer ricasso, blunted, or wrapped with a partial leather sheath, to allow the handler's grip on the blade to be shortened for quicker action. The hilt, or heft, of the sword typically consisted of a simple bar-shaped cross guard or slender rodlike *quillons* bent into a basket-shaped enclosure surrounding and protecting the handle, into which was inserted the blunt spike-shaped end, or tang, of the blade. The metal pommel that capped the end of the tang might be formed into any number of shapes, including multilobed forms, wheels, ovals, or more complex "perfume-stopper" designs, intended to counterbalance the weight and length of the weapon.

Kimberly L. Dawson Kurnizki

Bayonets enabled firearms to be quickly and easily transformed into serviceable pikes and could be attached by (a) plugging into the muzzle, (b) fitting as a sleeve over the muzzle, (c) locking into a slot on the muzzle, or (d) attaching permanently to the muzzle and folding down when not in use.

It is a historical irony that the golden age of the sword, the sixteenth and seventeenth centuries, was also the period during which gunpowder came into widespread use. As the military popularity of the sword began to wane, the fashion of carrying a sword became increasingly common among male civilians, inspired in no small measure by the rise of dueling among the nobility. Lighter weapons, such as the rapier, became especially popular. The épée, with its slender, three-edged blade pointed only at the tip, and the dueling saber, sharpened along one of its three edges, evolved as various schools of fencing became formalized, each with its own distinctive, nationalistic flavor.

Among the principal developments of this period was the introduction of the *main gauche*, a specialized form of long dagger wielded in the left hand, designed as a shorter twin of its full-length companion sword. The main gauche allowed a swordsman to

bring his free hand into play to menace or parry the thrusts of an attacker. A popular variant from around 1600 was the sword breaker, with comblike notches along one edge that enabled a defender to ensnare and, with sufficiently developed strength of the wrist, even break his opponent's blade. A rarer form of sword breaker featured blades designed to spring open from either side of the dagger's blade at the touch of a button, although oddities such as this were probably more formidable in appearance than useful in actual combat.

The seventeenth century dueling sword was a stiff, straight-edged weapon whose development owes much to the simplified and widely adopted French school of fencing. Its narrow blade was designed primarily for thrusting attacks, but it was also quite capable of delivering cuts to the arms or face. Imported Spanish, Italian, or German blades, fitted with a fashionable "swept" hilt after delivery, were especially popular. The ricasso of the blade was often imprinted with spurious trademarks and signatures, often misspelled, of famous bladesmiths. Guards became increasingly complex, often featuring elaborately curved quillons or tines intended to ensnare an enemy's blade or rings to guard a finger hooked over the cross guard for better control.

By the end of the eighteenth century, the military sword had entered into its period of decline. The cutlass-like infantry short sword used by Napoleon's Grande Armée, which evolved from the huntsman's sword, was more useful as a bivouac tool than as a weapon. The cavalry saber, however, retained a vestige of its authority and was used decisively as late as the Mexican-American War (1846-1848) in actions at Palo Alto and Resaca de las Palmas (1846) and Contreras-Churubusco (1847), as well as in numer-

Library of Congress

The cavalry saber was used decisively as late as the Mexican War (1846-1848) in the Battle of Palo Alto.

ous campaigns of the so-called American Indian wars of the nineteenth century. In fact, cavalry troopers regularly practiced with sabers as part of their customary tactical evolutions well into the second half of the nineteenth century.

In Japan the development of an elaborate and sophisticated dueling cult fueled the evolution of the single-edged samurai sword, more properly known as the *katana* (sword) or *daito* (long sword). Intended to be wielded with two hands, the katana was worn tucked into the waist sash along with a companion sword, identical to it but shorter in length, called the *wakizashi*. A short dagger, called the *tanto*, was generally worn by women and tradesmen for their personal protection. Practice in the art of Japanese fencing was facilitated by the use of a more forgiving bamboo "sword," called a *shinai*, or a wooden *bokken*.

Samurai swordsmithing techniques, which reached a peak of sophistication during the late sixteenth century, constitute a variation of the hammer-welding process. A bar of hardened steel is sandwiched between softer iron, heated, hammered, and folded successively dozens of times to produce a fine cutting edge with a temper that is regulated by sheathing the blade in a fine clay slip. Heat treating of the exposed edge produces a visible pattern along the temper line that is categorized according to its resemblance to certain naturalistic forms. Military officers' swords bearing serial numbers on the blade, mass-produced during World War II, are of considerably less value than are authentic handmade blades. Blades prized too highly for use in battle were often kept in an unadorned white wood storage scabbard, called a *shira saya*, resembling a simple pinewood cane.

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Larry Smolucha

Pole Arms

Dates: c. 1500-1900

Nature and Use

The generic term for any type of thrusting or cutting weapon mounted on a long handle is pole arm. These weapons have been in use since the time of primitive humankind, and they persist to this day in vestigial form as bayonets affixed to the muzzles of rifles. Because pole arms allow both thrusting and cutting, many types have evolved over the centuries under a wide variety of names. Generally those pole arms designed for thrusting only have been called spears, or since the fifteenth century, pikes, after the French word *pique*. The lengths of pikes varied greatly, though they commonly measured between 15 and 21 feet. Such lengths made pikes unwieldy and awkward for use in individual combat. To be effective in battle, pikes had to be used en masse, because a single pike could be blocked or evaded, allowing the enemy to attack in close. The best use of pikes was a dense formation in which overlapping rows of pike heads threatened the enemy.

Because of the pike's limited utility in close combat, pole arms with shorter shafts and cutting edges were developed. Typically such weapons were mounted on shafts of about 4 to 6 feet in length. In Europe the most common forms of cutting-edged pole arms featured either ax-heads or swordlike cutting blades. A bewildering variety of names in many languages were created to describe weapons whose appearances and uses were often quite similar. An early pole arm popular with knightly combatants was the poleaxe, which combined a short, hammer-shaped head and a strong pike-head with a spike on the back of the head. The halberd combined an ax-head with a pike point and a spike on the back of the head. Another common weapon was the glaive, which featured a swordlike cutting edge and some form of spike set at an angle to the head. The spikes on the backs of these weapons generated great penetrating power and could also be used to drag mounted combatants from their saddles.

To ensure that the heads were not cut off their shafts, most of these pole arms featured steel shanks called *langets* that extended part way down the shaft. The langets were usually riveted to the shafts. By putting cutting heads on the ends of long shafts, infantry gained not only reach over their adversaries but also weapons capable of penetrating the increasingly common plate armor of the late Middle Ages and Renaissance. Another common feature of early pole arms was a small steel roundel mounted at the base of the blade. This roundel deflected blows sliding down the blade away from the user's hands. These weapons were very popular among infantry forces throughout the Renaissance. Other pole arms featured wide-bladed heads in the shape of exaggerated spear points. These weapons probably derived from civilian boar spears, but the edges on these heads also allowed slashing attacks. Such weapons included the partisan and the spontoon.

Development

Spears have been in use as weapons since ancient times. The dense pike formations favored by the ancient Greeks and Macedonians were called phalanxes. Phalanxes were very daunting to face but could seldom maintain formation integrity when moving across rough ground. More mobile sword-armed foes such as the Romans defeated the pike-armed phalanxes by attacks to the flanks and rear. During the Middle Ages, battles were usually decided by shock delivered by a cavalry charge. The best antidote to the cavalry proved to be a steady, pike-armed infantry. Overlapping ranks of pikes deterred the horses and gave the infantryman a weapon long enough to strike his mounted foe. The best-

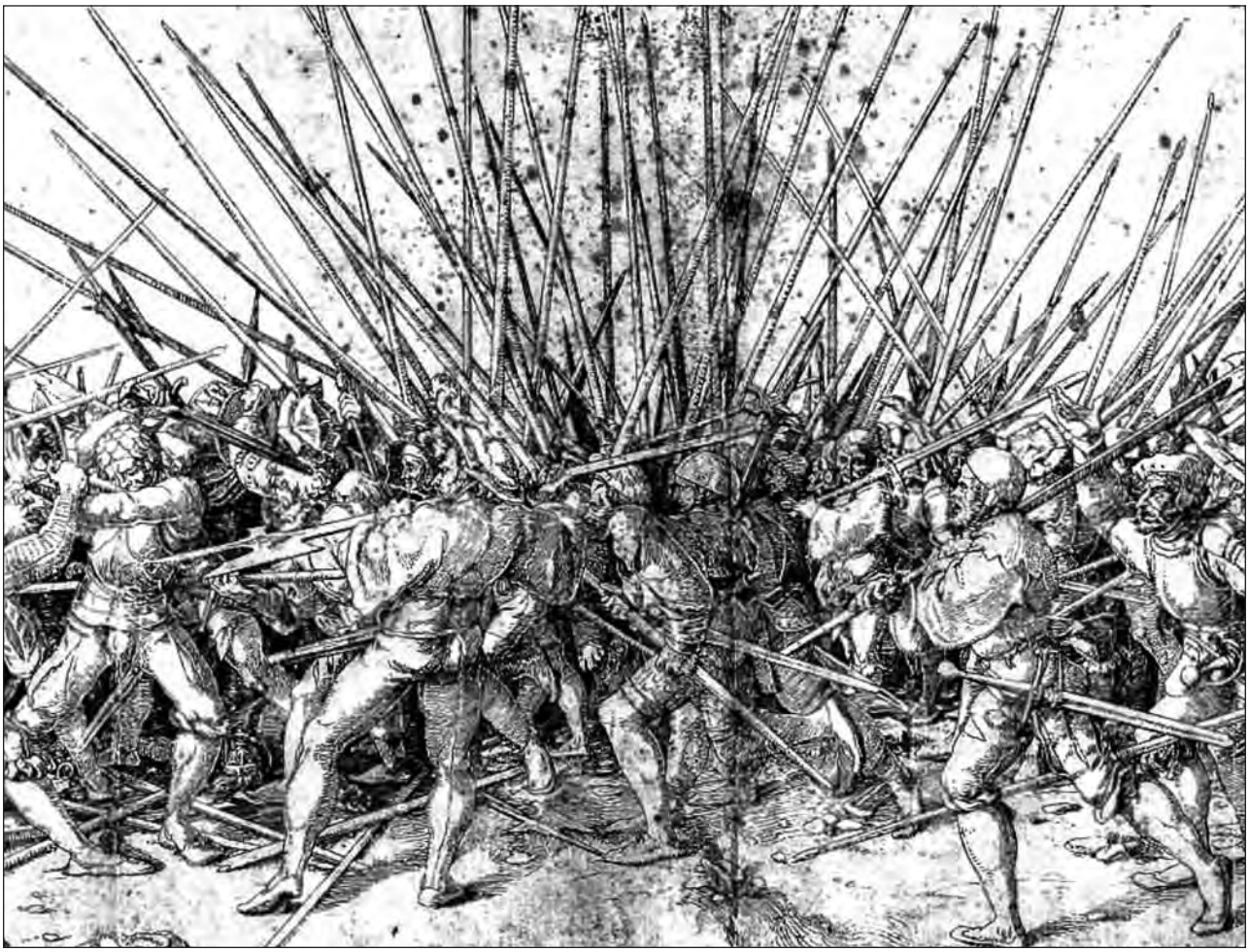
known and most effective infantry of the Middle Ages was that of the Swiss pikemen. Threatened by the Burgundians in the fourteenth century, the Swiss cantons defended themselves with militia forces using pikes. Since the militiamen could not afford the expensive armor of the day, most went into battle with little or no armor. Without the weight of armor these foot soldiers could travel easily across even the roughest terrain. Their formations could therefore move with unprecedented speed. When facing cavalry forces, the rapid Swiss infantry charges usually overwhelmed the enemy before it could properly deploy for battle. At battles such as Morgarten (1315) and Sempach (1386) the Swiss caught mounted knights in restricted terrain and inflicted horrendous casualties with their pikes. The Swiss also found that if the front of their formations became disordered or if mounted knights penetrated into the pike phalanx, the pike's awkward length made the pikemen vulnerable and resulted in many casualties. To protect the pikemen, the Swiss began to include a number of halberd-armed men in every pike column. The halberd's shaft still allowed it to reach a mounted man, but its shorter length allowed it to be swung within the confines of the phalanx's inner ranks. In addition, the length of the shaft allowed a great momentum to be imparted into the weapon's head, thus creating the great percussive power necessary to penetrate or crush the plate armor of the day.

By the beginning of the sixteenth century, disciplined pike-armed infantry had become the backbone of Europe's increasingly professional armies. At the same time, firearms had become lighter and convenient enough to be used by infantry in battle. Such handheld firearms could inflict heavy casualties upon pike-armed forces arrayed for battle but suffered from the very serious shortcoming that the harquebusiers were vulnerable while performing the slow and complicated steps involved in reloading their weapons. Under El Gran Capitán, the Spanish commander Gonzalo Fernández de Córdoba (1453-1515), Spanish forces began to combine blocks of pike men with blocks of harquebusiers. Such formations, called *tercios*, were successful combined-arms units. The harquebusiers deployed outside the pike square and fired into the enemy lines. If the enemy charged, the harquebusiers could retreat into the pike formation for protection. Thus a tercio combined continuous fire with the shock power of the pike. The devastating potential of these tactics was demonstrated at the Battle of Cerignola (1503). A French force of cavalry and Swiss mercenaries attacked Fernández de Córdoba's Spanish forces deployed behind a ditch. The fire of the harquebusiers was so severe that the French formations broke apart, whereupon Fernández de Córdoba's pikemen charged. The disordered French were overwhelmed and suffered heavy casualties. These tactics put a premium on the pikes and handguns but reduced the need for cutting weapons such as halberds and glaives.

By the beginning of the seventeenth century the need for pikes was further reduced by the military reforms introduced by the military innovator Maurice of Nassau (1567-1625). Maurice's reforms reduced the size and depth of formations to facilitate maneuverability and increased the number of muskets in units. Adopted throughout the continent, these re-

Turning Points

1315	Swiss pikemen begin a string of victories against mounted knights by defeating the Austrians at Morgarten, leading to their fourteenth and fifteenth century dominance of infantry warfare.
1503	The first effective use of the combination of firearms and pikes, a formation called the "Spanish Square," is made at the Battle of Cerignola.
c. 1600	The military reforms of Maurice of Nassau reduce the size and depth of pike formations to facilitate maneuverability and increase the number of muskets in units.
1688	Sébastien Le Prestre de Vauban introduces the socket bayonet, which fits over a musket's muzzle and allows the musket to be loaded and fired with the bayonet attached. As the socket bayonet replaces the pike, specialized pike troops disappear from use.



An engraving by Hans Holbein the Younger showing Schlechten Krieg, or "bad war," the result of tangled pole arms (here, pikes wielded by Swiss pikemen, or Landsknechte) in an early sixteenth century battle.

forms saw mixed pike and gun formations with the ratio of guns to pikes increasing; for example, by the end of the English Civil War of 1642-1651 the forces of the New Model Army of military leader Oliver Cromwell (1599-1658) averaged two or three guns per pike.

As the need for dense pike formations decreased due to the increasing reliability and firepower of handguns, the use of pole arms such as the halberd and glaive underwent a great change. The potency of pike- and gun-armed forces was tied directly to their ability to hold formation. Disordered ranks proffered openings that invited an enemy charge; once a formation was breached, individuals were vulnerable. In a pike formation, though, a halberd was too short to be of use except in extreme circumstances. Thus halberds were increasingly relegated to use by officers and line sergeants. For junior officers, the shaft of a halberd was a good tool for aligning ranks, pushing against the backs of men who were slow to advance. If a unit disintegrated, such a weapon could also be useful in a melee. As a result, varieties of pole arms such as spontoons and partisans saw increased usage as badges of rank, especially for noncommissioned officers. As these weapons became less necessary in the battle line, they became more ornate and ostentatious. Halberds and spontoons of this period, for example, often featured embossed coats of arms on

their blades. These weapons were especially evident at parades and other formal occasions. By the end of the eighteenth century such weapons had largely disappeared from battlefield use, but they remain in ceremonial use to this day. England's ceremonial guards, the Beefeaters, and the Papacy's Swiss Guard, for example, still serve at their posts with halberds in hand.

As the proportion of pikes in a formation continued to decline, a simple solution to the need for pike protection for the musketeers was the introduction of the bayonet. A bayonet was a cutting weapon that could be affixed to the muzzle of a musket to turn it into an emergency pike. Bayonets ranged in length from oversized knives to short swords. The earliest bayonets were plug bayonets, which were probably introduced in the early 1600's, though the earliest accounts of their use date from the 1640's. These were typically double-edged daggers whose handles fit into the muzzle of a musket or harquebus. The difficulty of a plug bayonet was that while it was being used, the harquebus could not fire. In 1688 this problem was solved when the French field marshal Sébastien Le Prestre de Vauban (1633-1707) introduced the socket bayonet, a bayonet mounted on a socket so that the blade was offset to the side. The socket fitted over a musket's muzzle and onto a lug located near the muzzle. This allowed the musket to be loaded and fired with the bayonet attached. Although it was not as long as a pike, the bayonet offered the soldier a pike-like weapon for close-quarter fighting. With the bayonet at hand, there was no longer a need for specialized pike troops, and pikes disappeared from use. Since Vauban's introduction of the socket bayonet, bayonets have been in continuous use throughout the world. Changes in the shape of the socket or the size of the bayonet have not altered the weapon's basic function. Although many military thinkers praised the bayonet charge as the ultimate moment in battle, statistics show that by the nineteenth century bayonet combats were very rare. Indeed, the diaries and accounts of soldiers indicate that bayonets were used far more often for utilitarian purposes such as opening cans, cooking food over a fire, or chopping brush than for battle. In the late twentieth century bayonets increasingly became more of a utility tool than a weapon. Many Soviet bayonets, for example, featured a lug on the scabbard and a matching hole near the bayonet's tip to allow the blade to fit over the lug and be used with the scabbard as wire-cutter with the bayonet's back edge as the cutter. Although this innovation enhanced the bayonet's usefulness, it removed it yet further from its roots as a pike.

Although pole arms ceased to be realistic weapons of war by the end of the 1600's, their simplicity has made them useful in conditions of extreme need. For example, while planning for his slave insurrection, the abolitionist John Brown (1800-1859) forged pikes with which to arm runaway slaves. In the final days of World War II, Japanese civilians, including women, trained with bamboo pikes as part of the planned last-ditch resistance to an American landing.

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Kevin B. Reid

Gunpowder and Explosives

Dates: Since c. 1500

Nature and Use

An explosive is a stable substance or device that upon detonation produces a volume of rapidly expanding gas that exerts sudden pressure on its surroundings. In general, explosives are divided into two general types: propellants and detonators. Propellants, such as gunpowder and jet fuel, are used to accelerate projectiles, particularly bullets and rockets. Detonators, such as dynamite (trinitrotoluene, or TNT), are often used to ignite propellants. Detonators that can be touched off only by a high-energy source are termed high explosives.

Explosives are further classified as blasting explosives and military explosives. Blasting explosives are typically used in mining, construction, and tunnel building. Military explosives are used in bombs, explosive shells, torpedoes, and missile warheads. Military explosives must be physically and chemically stable over extreme ranges of temperature and humidity for long periods of time. They must also be insensitive to impacts, such as those experienced by an artillery shell when it is fired from a gun or penetrates steel armor. Military explosives are used for a wide range of purposes: They are fired in projectiles and dropped in aerial time bombs without premature explosion. Raw materials necessary to manufacture such explosives must be readily available for high rates of production during wartime.

Another classification of explosives separates them into chemical, mechanical, and nuclear types. Chemical explosives, such as gunpowder and dynamite, are the most commonly used and explode through chemical reactions. Mechanical explosives involve physical reactions, such as a container's being overloaded with compressed air. Nuclear explosives produce a sustained nuclear reaction and are the most powerful explosives.

The first known explosive was black powder, also known as gunpowder. It was developed in China during the tenth century or possibly earlier. The initial purpose was for use in fireworks and signals. The first European mention of gunpowder was by thirteenth century scientist and educator Roger Bacon (1220-1292), who recorded a recipe in 1267. His term, "fire for burning up the enemy," suggests that Bacon regarded gunpowder as an incendiary, not a propellant. The composition he suggested endured for more than three hundred years and consisted of 75 percent potassium nitrate (saltpeter), 15 percent charcoal, and 10 percent sulfur. The charcoal and sul-

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A hand grenade.

fur constitute the fuel of the powdered mixture, whereas the saltpeter acts as the oxidizer.

Black powder revolutionized warfare and played a significant role in the development of European patterns of living up until modern times. The Chinese first used black powder as a gun propellant as early as 1130, placing it in bamboo tubes that were reinforced with iron to propel stone projectiles and arrows. When used in war, gunpowder was often more successful in creating fear in the enemy ranks than in inflicting actual damage. Chinese records indicate that the Chinese used black powder in bombs for military purposes. Torches, glowing tinder, or heated iron rods were used to ignite the powder, and usually, a trail of the powder led to the main charge in order to give the firer time to reach safety.

Firearms that use gunpowder are frequently mentioned in fourteenth century manuscripts from many different countries. By the end of the fourteenth century, many countries were using gunpowder as a military aid to breach the walls of castles and cities. Although black powder remained the standard gun propellant until the late nineteenth century, it is now used only in igniters, safety fuses, and fireworks.

DEVELOPMENT

In 1425 the mixing process for the ingredients of black powder was greatly improved when the corning, or granulating, process was developed in England. Heavy wheels ground and pressed the fuel and oxidizer into a solid mass that was subsequently broken down into smaller grains. The first gunpowder mill was erected near Nuremberg, Germany, in about 1435. Corned gunpowder was used for small guns and hand grenades during the fifteenth century.

By 1540 the French had become the first people to control explosive pressure in wheeled cannons by using relatively large, slow-burning powder grains of uniform size. In the seventeenth century, the English and Dutch militaries developed the howitzer, a short cannon firing explosive shells in a high arc to hit a distant target. Large muskets were used in America with some success during the French and Indian War (1754-1763). Shorter, lighter muskets were the most widely used weapon in the American Revolution (1775-1783). If the French had developed more fieldworthy muskets, they might have had more success in the Napoleonic Wars (1793-1815).

In the 1790's Henry Shrapnel (1761-1842), an English artillery officer, developed the "shrapnel shell," consisting of a spherical shell packed with a small charge of black powder and several musket balls. These single-shot multiple explosives were effective against concentrations of enemy troops. By using batteries of many guns, massed artillery fire was employed to destroy attacking enemy formations or to disrupt defending forces before they could launch an attack. During the early 1800's, mobile artilleries, including horse-drawn units, were used to shift explosives from one strategic location to another on the battlefield.

In 1805 English artillerist Sir William Congreve (1772-1828) used gunpowder to develop rockets for warfare and launching tubes to greatly improve the rockets' accuracy. Congreve's inventions expanded the use of rockets for military purposes, greatly changing the way war was waged in Europe. Hand-to-hand combat with specific implied rules of chivalry became outdated, as more powerful gunpowder weapons that produced a higher number of casualties and more serious wounds were adopted. Congreve's rockets were used to bombard Boulogne, Copenhagen, and Danzig in the Napoleonic Wars and in the British attack on Fort McHenry (1814), near Baltimore, Maryland, during the War of 1812 (1812-1815).

The development of different types of guns to propel explosive charges became critical in warfare. In the Crimean War (1853-1856), Russian troops armed with smoothbore muskets were no match for the British, with their more advanced musket rifles. The deadly effect of rifled muskets was clearly demonstrated during the American Civil War (1861-1865). Because individual soldiers could hit their enemies with accurate fire out to 250 yards, frontal attacks, in which soldiers advanced in ordered ranks across open fields, had to be abandoned. By 1862 both Union and Confederate troops had built field entrenchments and barricades to provide protection from artillery explosives. During the Battle of König-

F. R. Niglutsch

During the Battle of Königgrätz, Prussian soldiers were able to overwhelm the Austrians by firing six shots from their high-powered rifles for every shot discharged by the Austrian muzzle-loading rifles.

grätz in the Seven Weeks' War (1866), Prussian soldiers were able to overwhelm the Austrians by firing six shots from their high-powered rifles for every shot discharged by the Austrian muzzle-loading rifles.

Until the discovery of fulminating gold in the early 1600's, gunpowder was the only known explosive. Gunpowder remained in wide use until the mid-1800's, when the first modern explosives, nitroglycerin and dynamite, were invented. Nitroglycerin was discovered by an Italian chemist, Ascanio Sobrero (1812-1888), in 1847. Its value for blasting was later demonstrated by Swedish inventor Alfred B. Nobel (1833-1896), who also invented dynamite in 1866. Stable ammonia dynamites began to appear in the late 1880's, followed by low-freezing dynamites after 1925.

Since black powder is relatively low in energy, leaves a large proportion of corrosive solids after explosion, and absorbs moisture readily, it was succeeded in the late 1800's by smokeless gunpowder and picric acid. The first smokeless powder, known as cordite, was invented by English chemists Sir James Dewar (1842-1923) and Sir Frederick Augustus Abel (1827-1902) in 1889. It was made in two forms: a gelatinized nitrocellulose and a mixture of nitrocellulose and nitroglycerin, with a small quantity of petroleum jelly to act as a stabilizer. Smokeless powder soon became the primary ammunition used in pistols.

As early as 1873 picric acid was detonated to produce explosions, and it was found in 1885 to be a suitable replacement for black powder. From 1888 into World War I, it was used as the basic explosive for

TURNING POINTS

c. 1300	The Chinese first use black powder to propel projectiles through bamboo tubes, revolutionizing warfare.
c. 1425	The corning, or granulating, process is developed to grind gunpowder into smaller grains.
c. 17th cent.	The howitzer is developed by the English and Dutch for use against distant targets.
1754-1763	Large muskets are first used successfully by Americans in the French and Indian War.
1790's	British artillerist Henry Shrapnel invents the "shrapnel shell," packed with gunpowder and several musket balls and designed to explode in flight.
1805	British artillerist William Congreve develops first warfare rockets and launching tubes.
1904-1905	Trinitrotoluene (TNT) is first used as a military explosive during the Russo-Japanese War.
1944	Germany launches the first long-range ballistic missiles, the V-1 and V-2, against England during World War II.
1945	The United States drops the first atomic bombs, whose huge explosive impact derives from nuclear reactions, on the Japanese cities of Hiroshima and Nagasaki, effectively ending World War II.

military purposes. Because it required prolonged heating at high temperatures in order to melt, and because it also caused shells to corrode in the presence of water, an active search for better explosives continued.

During the twentieth century, TNT was the most commonly used conventional military explosive. Although it had been used extensively in the dye industry during the late 1800's, it was not adopted for use as a military explosive until 1902, when the German army used it to replace picric acid. TNT was first used in warfare during the Russo-Japanese War (1904-1905). The U.S. Army began using it in 1912. After an economical process was developed for nitrating toluene, TNT became the chief artillery ammunition in World War I (1914-1918). The most valuable property of TNT is that it can be safely melted and cast alone or with other explosives as a slurry.

During World War I, all of the major powers adopted smokeless powder, bolt-action, magazine-fed repeating rifles. These rapid-fire weapons rendered the battlefield a "no-man's-land." Massed artillery explosive fire denied both sides the ability to maneuver forces, a condition that led to trench warfare, such as at the Battle of the Marne (1914), where the Allies stopped the Germans from advancing farther into France. As a result, gas shell projectiles loaded with chlorine and mustard gas were employed against the enemy. The Germans also made wide use of liquid oxygen explosives during World War I.

With the advent of tanks, World War II (1939-1945) saw a return to maneuver tactics, with artillery explosives continuing to provide the most destructive force on the battlefield. Nitroguanidine, referred to as Gudol Pulver, was a primary explosive used during World War II. It produced very little smoke, had no evidence of a muzzle flash on firing, and also increased the lifetime of the gun barrel. Pentaerythitol tetranitrate (PETN) and cyclotrimethylene trinitramine (RDX) were developed for use as detonators and for filling hand and antitank grenades. A mixture of TNT, RDX, and wax was used to detonate bombs. A mixture of PETN and TNT was used for detonating demolition charges. Torpedo warheads were often made of cast mixtures of RDX, TNT, and aluminum.

Some of the most effective weapons used during World War II were missiles, consisting of a rocket that delivered an explosive charge called a warhead. The first successful long-range ballistic missile was the German V-2 that was principally developed by Wernher von Braun (1912-1977), a pioneer of German rocketry. These missiles were launched into England from German-occupied countries in Europe. Most ballistic missiles, aircraft munitions, and artillery use solid rocket propellants.

The atomic bomb was the first nuclear weapon to be developed, tested, and used. Developed under the direction of American physicist J. Robert Oppenhei-

mer (1904-1967), it was implemented near the end of World War II. On August 6, 1945, an atomic bomb was dropped by an American B-29 bomber, the *Enola Gay*, over Hiroshima, Japan, instantly killing more than 70,000 people. On August 9, the United States dropped a second atomic bomb, killing some 40,000 people in Nagasaki, Japan. Due to such devastation, this explosive device has never again been used in a war.

In more recent conflicts, such as the Korean War (1950-1953) and the Vietnam War (1961-1975), artillery explosives provided most of the fire support for ground forces. Laser-guided projectiles were developed to destroy tanks. During this period the United States began using medium-sized howitzers capable of firing chemical and nuclear explosives. Grenade launchers saw a great deal of action in Vietnam, and search-and-destroy air explosives razed numerous Vietnamese villages.

During the 1990's advances in onboard computer systems and self-locating capabilities enabled modern cannons and missile launchers to move independently around the battlefield, stopping to fire explosives and then quickly moving to a new firing position. Some modern artillery cannons and launchers can deliver "smart" explosives. These projectiles and warheads use sophisticated seekers and sensors to locate and home in on stationary or moving targets.

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Alvin K. Benson

Small Arms and Machine Guns

Dates: Since c. 1500

Nature and Use

Small arms are firearms that are designed to be carried and fired by individual soldiers. A machine gun is a firearm that continues to fire automatically as long as the operator keeps the trigger depressed. Medium and heavy machine guns are technically not small arms, because they are designed as crew-served weapons.

Firearms are weapons in which a projectile, normally made of lead, is propelled by confined gas generated by the rapid burning of some kind of gunpowder. Firearms have, at every stage of their development, repeatedly revolutionized the tactics and strategy of warfare, and they are universally the weapons of individual soldiers.

All modern firearms trace their lineage back to the small cannon of the thirteenth century. From this clumsy beginning all varieties of modern firearms have developed: the rifle, a shoulder-fired weapon supported with both hands; the pistol, designed to be held and fired with one hand; and the machine gun, models of which vary enormously in power, weight, and complexity.

A light machine gun fires a rifle cartridge and is effective up to 600 yards. A medium machine gun fires a similar cartridge but is normally mounted on a tripod and served by a crew. A heavy machine gun fires a much more powerful cartridge—usually about 0.5 inch (12.5 millimeters) in caliber—and can be used effectively to up 2,000 yards. Heavy machine guns are not only infantry weapons; they are also found mounted on tanks, helicopters, and fixed-wing aircraft. Submachine guns ordinarily fire pistol cartridges and are designed to be easily carried and operated by one person. The useful aimed-fire range of such a weapon might be from 75 to 100 yards.

The general pattern of firearms development has been to increase their portability, power, accuracy, and speed of operation. By 1500 the cart-mounted small cannon of the Middle Ages had evolved into the hand cannon, which had become, by the late sixteenth century, the musket—a smoothbore shoulder-fired weapon that would dominate military tactics and strategy until the mid-nineteenth century.

Development

Black powder, the earliest form of gunpowder, is a mixture of potassium nitrate, sulfur, and charcoal. When ignited by a flame, it burns rapidly and generates a great deal of gas. This gas, expanding in a gun barrel, can drive a bullet or shell at high velocity. Gunpowder is believed to have originated in China, during the tenth century or possibly earlier. The earliest firearms were extremely cumbersome; they had to be carried in carts or set on wooden trestles and were more like small cannons. It was not until the mid-fourteenth century that portable hand firearms loaded from the muzzle end were introduced. In muzzle-loading weapons, a powder charge is poured into the barrel and a projectile is pressed down upon the charge. The powder is ignited by a lighted match, a cinder, or a hot wire. Access to the powder charge is through a small hole drilled in the breech of the gun, and when the match or hot wire is placed against the touch hole, the charge is lit. Although such guns had a range of several hundred yards, they were not very accurate. A less skilled soldier could be expected to hit a stationary man-sized target consistently at only 40 or 50 yards.

In the early years of firearms development neither the rates of fire nor the accuracy of handheld weapons was equal to those of the longbow or crossbow. Consequently the cannon, whose range, striking power, and relative ease of manufacture made it superior to the catapult, had an earlier impact on military tactics and strategy. Like the longbow and

crossbow, handheld firearms did have the ability to penetrate armor. Indeed, firearms were superior to longbows and crossbows in striking force, thereby accelerating the disappearance of the armored mounted knight in battle. Troops using firearms were vulnerable to cavalry or mass infantry shock attacks and consequently required the protection of pike formations or entrenchments. Their usefulness was limited to harassing fire and skirmishing preliminary to the main action. Before firearms could become universally practical weapons of war, a number of difficult technical problems had to be solved. These problems fall into the general categories of ignition, accuracy, and speed.

Ignition

Until the mid-nineteenth century nearly all firearms, including artillery, were loaded from the muzzle end. Neither the metallurgy nor the manufacturing techniques of gun making lent themselves to the invention of a breech closure that could be consistently sealed against the escape of powder gases during firing. Not only would propellant gases escape with each shot, endangering the shooter, but heat and gas resulting from continued firing quickly eroded and destroyed the breech mechanism. Consequently, technical progress focused on refining the method of ignition. The inconvenience of carrying a separate match or hot wire was first surmounted by the matchlock device, which was developed around 1450. In the matchlock a curved piece of metal called a cock, for its resemblance to a rooster's neck, held a lighted "match," usually a cord of hemp fiber that had been soaked in a solution of saltpeter. To fire, the match was pressed against a small pan placed alongside the touch hole into which a few grains of powder acting as a priming charge had been placed. The cock was moved by means of a mechanically linked trigger. The matchlock's advantage was immediately appreciated, and its development was rapid. The Spanish harquebus, a matchlock weapon, was successfully and decisively used at the Battle of Pavia in 1525. In this battle, the decisive military engagement of the war in Italy between Francis I (1494-1547) of France and the Holy Roman emperor and Spanish king Charles V (1500-1588), the French army of 28,000 was virtually annihilated by a Spanish force of 7,500, which included 1,500 harquebusiers firing volleys into the rear of the French cavalry and utterly routing them.

North Wind Picture Archives via AP Images

Nineteenth century sailors operating the hand-cranked Gatling gun, which utilized a system of barrels rotating around a central axis, each firing in turn.

TURNING POINTS

1690 The Brown Bess flintlock musket is developed, and its variations remain in use by all European nations until the mid-nineteenth century.
1700 The introduction of rifling and patched-ball loading increases the accuracy of firearms.
1848 The Sharps carbine, a single-shot, dropping-block breechloader firing paper and metallic cartridges, is developed.
1873 Colt single-action Army revolver issued.
1884 Hiram Maxim invents the first practical machine gun.
1898 The Mauser Model 1898 is produced, the culmination of military bolt action design.
1908 The Luger P.08 is adopted as the official German service pistol.
1936 The M1 Garand rifle is the first standard-issue semiautomatic military rifle.
1947 The Kalashnikov AK-47 becomes the first widely deployed modern assault rifle.

Because matchlocks required the use of a lighted match, they were not only cumbersome but also particularly susceptible to failure in wet weather. To remedy this problem, the wheel lock was invented in 1517. This mechanism used a revolving serrated wheel to strike sparks into the priming charge from a piece of iron pyrite. The wheel, which was spring powered, had to be wound up with a key. Although wheel locks were extremely expensive to manufacture, they were used extensively, because they could be managed by mounted troops on horseback. The wheel lock was also the first practical firearm for use in hunting, because it did not require a constantly lighted match.

The next great advance in firearms technology was the flintlock. The earliest flintlock was the *snaphaan*, or snaphance, developed in Scandinavia and Holland from about 1550 to 1570. This was the first ignition system to introduce the striking action of the cock, which was driven against a metal frizzen by a spring. The cock, with a piece of flint clamped in its jaws, struck a glancing blow against the frizzen, producing sparks to fire the priming charge. Flintlocks, in various forms, were used for nearly 300 years. Flintlock guns were manufactured for military purposes in England as late as 1842. In the most advanced flintlocks, the frizzen and pan cover were made in one piece that was moved by the action of the cock, thus simultaneously exposing the priming pan and firing the gun. This innovation was a great aid in protecting the priming charge from moisture.

In 1807 Alexander Forsyth (1769-1843), a Scottish clergyman and inventor, discovered that potassium chlorate could be detonated by a blow and used to ignite a powder charge. This discovery became the basis of all later percussion and self-contained cartridge development. Forsyth's first design used small pills of priming compound in existing flintlocks. Later experiments with tape and disk primers and the use of fulminate of mercury as the detonating compound brought about the development of the percussion cap, a small copper cap containing a bit of fulminate of mercury. The cap was placed over a hollow tube or nipple leading to the main powder charge. When struck by the descending hammer, the fulminate exploded to fire the gun. Similar caps became the basis of internally primed self-contained cartridges: the pinfire cartridge, invented by Casimir Lefaucheux (1802-1852) around 1828; the rimfire cartridge, developed by Louis Nicholas Flobert in 1845; and the center-fire cartridge, developed by American artist and inventor Samuel F. B. Morse (1791-1872) and first manufactured in 1858. Percussion caps made firearms far less susceptible to ignition malfunctions due to wet weather or mechanical problems. They brought about a substantial increase in the rate of fire. The old infantry tactic of charging the enemy to get within bayonet range became much riskier as rates of fire increased.

ACCURACY

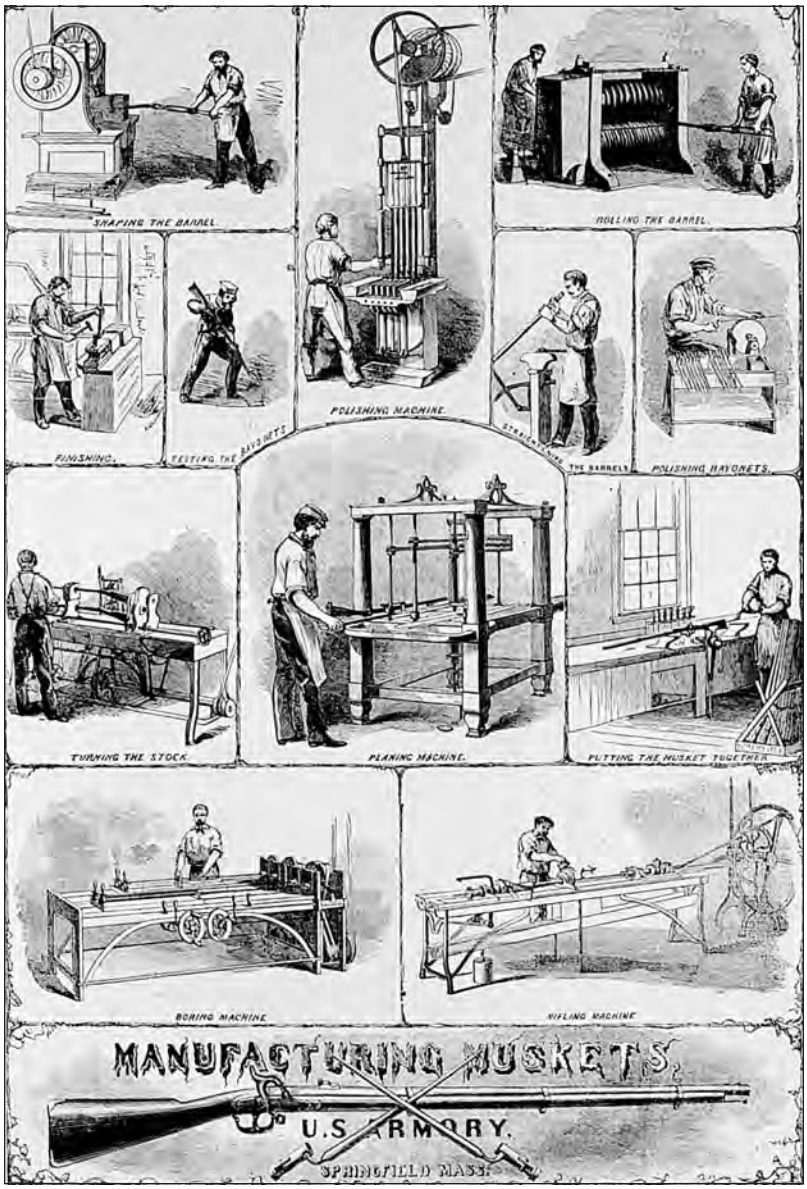
Most military firearms from the fifteenth century to the end of the nineteenth century fired a round lead ball of caliber 0.40 to 0.60. (In England and the United States "caliber" is usually reckoned in tenths

or hundredths of an inch; in most of the rest of the world the metric system is used.) Such a ball, weighing about one-half ounce, would be fired from a smoothbore barrel. The best such weapons could be loaded and fired two or three times per minute and provided a fair chance of hitting an enemy at 75 to 100 yards.

During the eighteenth and nineteenth centuries new tactics for such weapons evolved. Armies lined up in rows, and one rank would fire while another was reloading. For close combat, when there was insufficient time to reload, soldiers could fix swords or bayonets to the end of the rifle.

Greater accuracy and range could be achieved by cutting spiral grooves, or rifling, into the barrel and thus spinning the bullet or ball like a gyroscope. The bullet must fit the bore tightly to take the rifling, and consequently it is much more difficult to muzzle-load a rifle than a smoothbore weapon. The nineteenth century developments of patched balls and hollow-base cylindrical bullets were early attempts to overcome this difficulty. A hollow-base bullet is smaller than bore diameter so that it may be easily loaded. When the rifle is fired, the expanding gas presses the base of the bullet outward, forcing it into the rifling. The Minié ball, used extensively in the American Civil War (1861-1865), was such a bullet. With a rifled barrel and slow, careful loading, a sharpshooter might be able to hit a stationary enemy at 400 or 500 yards.

By the mid-nineteenth century, although few military leaders had yet perceived it, the combination of the rifled musket, percussion cap, and cylindrical bullet had made the old tactics obsolete. Battles in which soldiers stood out in the open to load and fire resulted in immense casualties, even with rifles that could be fired three times per minute. The heavy casualties suffered by both sides in the American Civil War demonstrated the need for new tactics.



Library of Congress

An engraving from an 1861 issue of Harper's Weekly *describes the Springfield Armory's manufacture of single-shot, muzzle-loading rifles, widely used weapons during the American Civil War.*

PROPELLANTS

Until 1885 the term "gunpowder" referred exclusively to black powder. Afterward, it came to refer to both black powder and smokeless powder. The nineteenth century discovery that treating cellulose with nitric acid and sulfuric acids produces nitrocellulose, or guncotton, an explosive compound, led to the development of smokeless gunpowder. Combustible substances such as glycerin, wood pulp, cotton, and cotton wastes are all used as sources of cellulose. The strength of the explosive compound depends on the degree of nitrification; unless the residual acid is carefully neutralized, these compounds can deteriorate and explode spontaneously. By the 1880's scientists had discovered ways of stabilizing nitrocellulose compounds to slow their combustion. These propellants are far more powerful than black powder and also far more efficient, in the sense that 90 percent of their weight becomes gas, leaving fewer solid particles to become smoke.

Smokeless powders offered immense military advantages. The effective range of small arms increased from 200 to perhaps 800 yards. The effective range of the largest cannons increased to more than 20 miles. Indeed, a few guns were deployed that could actually hurl a shell more than 75 miles. Moreover, there was no longer the immense amount of smoke that had shrouded battlefields where black powder weapons were used. Many battlefields, such as that at Waterloo (1815), were so obscured by the smoke of musketry that command and control became impossible. Smokeless powder also left far less residue in the barrel of a gun. The accuracy of a black powder gun declined quickly as the barrel became fouled. Modern small arms and machine guns do not fall off in accuracy with extensive firing. The superiority of smokeless powder was so obvious that nearly all of the world's armies abandoned black powder cartridges within just fifteen years after the first use of smokeless powder.

Smokeless powders are classified by their content. Single-base powders consist of nitrocellulose compounds only; double-base powders also contain nitroglycerin. Although the latter tend to contain more energy, they also tend to be more erosive in gun barrels, a significant factor for military weapons, particularly machine guns. Triple-base powders, which came into use in the late twentieth century, use nitroguanidine as an additional primary ingredient. These offer higher energy still and are also less erosive.

The burning rate and energy content of contemporary powder is controlled not only by the chemical composition of the powder but also by the size and shape of the grains. For example, the powder used in 16-inch naval rifles has grains of nearly an inch in diameter and 2.44 inches in length. By contrast, rifle and pistol powders have grains that can be less than 0.03 inch in both length and diameter.

SPEED

A further revolution in warfare resulted from the development of breech-loading repeating arms firing self-contained cartridges. Once it was discovered that a cartridge could be made of drawn brass, it became possible to design efficient breech-loading guns. When a brass cartridge is fired, the case is expanded by the pressure of the gases, sealing off the breech end of the mechanism. The first firearms of this sort were single shots that used hinged or dropping blocks to close the breech, but soon a variety of actions were developed to permit rapid repeat fire. Although the Spencer repeating lever-action rifle was used in the United States as early as the American Civil War (1861-1865), most military development focused on bolt-action magazine rifles. A bolt-action weapon is one in which a turning bolt locks a loaded cartridge in place and then extracts the fired case. An operating handle attached to the bolt gives the operator great leverage for the extraction operation. The first usable bolt-action weapon was the so-called needle gun, invented by Johann von Dreyse (1787-1867). Although not a very successful design, it was briefly adopted by the Russian and Prussian armies in the mid-nineteenth century and showed itself far more effective than the single-shot rifles used by Prussia's adversaries. The development of smokeless nitrocellulose-based powders in 1885 encouraged further bolt-action development. Smokeless powder rifles utilize a smaller bore diameter than black powder weapons. Although the fixed setting of the "battle sight" is normally for about 200 yards—

well within the point-blank range of the cartridges—the high-velocity metal-jacketed bullets they fire remain dangerous at 1,800 yards. Trained soldiers can fire ten aimed shots per minute. By 1890 every major army in the world, with the exception of the U.S. Army, was armed with bolt-action magazine rifles. The seminal design for these rifles was produced by Peter Paul Mauser (1838-1914), the German arms inventor and manufacturer. This became the basic infantry weapon of the German army in 1898, and its bolt action was widely, almost universally, copied around the world. The 7.92-millimeter cartridge used by the Germans fired a pointed 154-grain bullet at 2,880 feet per second. Because of its excellent ballistic qualities, this cartridge became nearly as influential for future designs as Mauser's rifles.

The American 1903 Springfield rifle is a modification of Mauser's 1898 model; for manufacturing rights, the United States government paid Mauser $200,000. Another notable twentieth century bolt-action military rifle design was the British Short Magazine Lee-Enfield (SMLE) .303, which was used in both world wars. All of these bolt-action rifles could be loaded very rapidly with cartridges from "stripper clips" that could be placed into slots in the receiver. A full magazine's worth of cartridges could be pressed into the rifle in just a second or two.

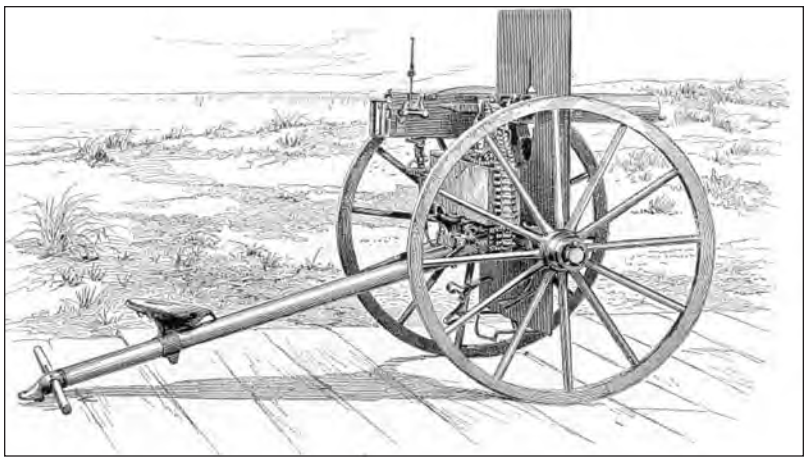
Some armies appreciated the impact of the increase in lethality of infantry weapons that resulted from rifling and breech-loading. For example, by 1870 the Prussians had dropped the close-order bayonet charge from their tactics. Prussian combat formations spread into "open order" so that all infantrymen acted as skirmishers, a technique informally developed by U.S. infantrymen from the middle of the American Civil War onward. Most general staffs did not fully understand until finally the combination of these rifles and the deployment of the machine gun produced the static trench system of World War I. The firepower that entrenched defenders could produce completely overwhelmed offensive action until the development of armored vehicles after World War I.

Automatic Weapons

An automatic weapon is one that continues to fire as long as the trigger is held back. Although assault rifles and a few light machine guns are carried by soldiers as individual weapons, most machine guns are crew-served weapons.

All four of the great pioneers of automatic weaponry—Richard Gatling (1818-1903), Sir Hiram Maxim (1840-1916), John M. Browning (1855-1926), and Isaac Lewis (1858-1931)—were Americans.

The hand-cranked Gatling gun, invented in 1862, utilized a system of barrels rotating around a central axis, each firing in turn. The first truly fully automatic gun, however, was invented by Maxim in 1884. It used the recoil energy of the gun itself to extract and eject the fired cartridge case and to load a fresh cartridge. Although machine guns may be recoil- or blowback-operated, the most common method of firing is by tapping a bit of the propellant gas from the barrel. The expanding gas presses against a piston linked to the mechanism of the gun. In 1890 the first gas-operated gun was developed by Browning. A third important gas-operated machine gun design was provided by Lewis; Lewis's gun was later the first machine gun used in aerial combat. The Browning, manufactured by Colt, and the Lewis gun,



North Wind Picture Archives via AP Images

The Maxim field gun, the first fully automatic gun, invented in 1884.

manufactured by Vickers and Savage, were the mainstays of Allied armies in World War I. The German MG08 machine gun, known as the Spandau, was a redevelopment of Maxim's design.

Of the different magazine-feed systems developed for machine guns, the belt of cartridges became the most dominant. In this method, cartridges are tied together by spring clips in long "belts" that feed into the gun during firing and are ejected on the other side. Modern military machine guns have cyclic rates of 500 to 1,000 rounds per minute.

Hulton Archive/Getty Images

Sir Hiram Maxim explains to his grandson how his machine gun works.

The use of machine guns during World War I completely changed the face of war. During the British attack on entrenched German positions at the Somme in July, 1916, the attackers suffered 60,000 casualties on the first day, of whom 20,000 were killed. Most of these casualties were inflicted by machine guns. The military establishments of the warring powers had been unable to conceive of the firepower of the machine gun and the magazine rifle and seemed unable to adjust their tactical thinking. In effect the war became a siege punctuated by occasional vast slaughters as troops were forced again and again to attack in the open. As the lesson sank in, it resulted in the disappearance of cavalry from the world's armies and the development of armored vehicles to punch through infantry emplacements.

SEMIAUTOMATIC RIFLES

A semiautomatic weapon is one that fires a shot for each pull of the trigger, as opposed to a machine gun, which continues to fire for as long as the trigger remains depressed. Semiautomatic rifles are much harder to design than are machine guns, because the latter tend to be crew-served weapons; their added weight and bulk are less significant than for rifles. The first semiautomatic rifle deployed as a standard infantry weapon by a major power was the M-1, designed by John C. Garand (1888-1974) and adopted by the United States in 1936. This gas-operated .30-caliber weapon weighed less than 10 pounds. It was the best military rifle of World War II and was widely copied by other designers.

ASSAULT RIFLES AND SUBMACHINE GUNS

In the decade following World War II most countries designed or built full-caliber rifles similar to the

M-1; many of these were "selective-fire" weapons, which could be fired either automatically or semiautomatically. The U.S. M-14 rifle is an example. The M-14 was similar to the M-1, but it loaded from a twenty-round box magazine. A skilled soldier could fire fifty aimed shots per minute with this weapon. Partly as a result of studies showing that relatively few infantrymen in combat actually fired their weapons and that even fewer aimed them, the major powers began to concentrate on designing lighter rifles for intermediate-range cartridges. At the end of the twentieth century the world's two most common military rifles were the U.S. M-16, a selective-fire .22-caliber assault rifle, and the Russian AK-47, a selective-fire rifle of similar weight that shoots a short .30-caliber cartridge. The cartridges for such rifles are normally carried in twenty- or thirty-round magazines, giving soldiers great firepower. Although the M-16 is capable of great accuracy, the AK-47's sights are very rudimentary; these rifles were designed primarily for "suppressing fire," or large amounts of fire whose primary purpose is to force the enemy to keep their heads down. Infantry tactics have been adjusted accordingly: Flanking rather than frontal assaults are the rule, while the high volume of fire forces the defenders to lie low until they have been enveloped and overwhelmed by close-range automatic weapons fire.

Submachine guns have a similar role in close-range fire. The first submachine gun used in combat was the 9-millimeter Bergmann, introduced by Germany in 1918 at the end of the World War I. During World War II most of the major powers issued submachine guns of various kinds. The best-known and most influential were the British Sten gun, the American Thompson submachine gun, and the German Schmeisser MP40. All of these fired pistol cartridges. Submachine guns made the pistol obsolete as a practical offensive weapon: They cost less than pistols to produce, and they produce a tremendous volume of fire that is directable at longer ranges. They were considered particularly useful for street fighting in cities and towns. The newest models of submachine guns add a "burst" mode to the common selection of semiautomatic or full-automatic fire. In burst mode the weapon will fire three shots for each pull of the trigger.

In most armies submachine guns are issued only for special operations in which close-range engagements are expected. Moreover, because submachine guns normally use subsonic pistol cartridges, they can be effectively silenced for stealth attacks.

Pistols

Pistols have gone through most of the same developmental patterns as heavier weapons. In military use the pistol was considered especially useful for mounted cavalry because it could be fired with one hand. A military flintlock pistol weighed 2 to 3 pounds and was about 12 inches long. A seventeenth century cavalryman would normally be armed with two or three loaded pistols as well as a sword or lance.

With the development of percussion caps and self-contained cartridges, pistol design forged ahead rapidly. Because pistols are low-powered weapons, compared with rifles, it is easier to design repeating mechanisms for them. In the days of black powder and percussion caps, revolvers were designed with a cylinder containing multiple chambers. The first successful design was patented by Samuel Colt (1814-1862) in 1835. With this weapon, the soldier could shoot six or more shots before reloading. Some designs made it possible to carry several loaded cylinders, thus permitting relatively quick reloading. Percussion revolvers were widely used as short-range weapons, particularly by officers during the American Civil War. Revolvers continued in military service after the development of metallic cartridges; although the first adopted in the United States was the Smith and Wesson 1869 .44 American, the most famous was the .45-caliber Colt single-action Army model of 1873, known as the Peacemaker. With a hiatus or two, this weapon has been in production since 1873.

Semiautomatic pistols were first built in Germany and Austria. Design work there culminated in the adoption of the Luger pistol as the official sidearm of the German military forces from 1908 to 1932. The American designer John M. Browning devised a dropping-barrel, locked-breech design, the best-known example of which is the .45-caliber Colt 1911 A1. Browning's locking system is used in nearly all military pistols built around the world.

Modern military pistol designs utilize the double-

Library of Congress

Samuel Colt with the Colt pistol.

action principle. The chamber of the weapon may be loaded while the hammer is uncocked. The gun may be fired either by a long straight through-pull on the trigger or by an initial cocking of the hammer, which gives a lighter trigger pull. After the first shot, the hammer remains cocked. The M9 Beretta 92 SB, the present American service pistol, operates in this fashion.

Statistics compiled by American military authorities during the course of World War II and the Vietnam War (1961-1975) show that the number of actual casualties inflicted upon the enemy with pistols was so small that it may not be worthwhile to spend any time or money on handgun design or procurement. However, because soldiers have always felt some comfort in the possession of a sidearm, their demand continues whether or not they are actually effective. Even though pistols are close-range weapons, they are extremely difficult to shoot accurately even at short range without a great deal of training and practice. The cartridges fired by modern military pistols generate 300 to 400 foot-pounds of energy, only a fraction of the energy produced by a rifle cartridge. Pistols have not had an effect on military tactics for many years.

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Robert Jacobs

Artillery

Dates: Since c. 1500

Nature and Use

Broadly defined, the term "artillery" refers to machines designed to propel missiles or projectiles of any kind. Since the Middle Ages, however, the term has described crew-served weapons using the combustion of a propellant charge to propel a projectile toward an enemy at ranges greater than those attainable with small arms. Artillery weapons are traditionally divided into categories based on their use in battle. Hence, naval artillery is deployed on ships, coastal artillery includes all guns designed for defending coastlines, and field artillery is utilized on land for support of battlefield operations. Within each of these categories are specific classes of weapons. The most common classes include guns, referring to artillery firing along a flat trajectory; howitzers, describing weapons firing along an angled trajectory between that of a gun and mortar; and mortars, referring to weapons firing at very high angles over relatively short distances. At one time armies also utilized siege artillery, designed to batter down city walls; garrison artillery, used to protect fixed installations; and various versions of horse artillery. These types of weapons have been replaced in the modern era by antitank, antiaircraft, atomic, and self-propelled artillery. The first two terms are self-explanatory, the third refers to artillery firing atomic warheads, and the fourth describes artillery fitted to motorized—usually tracked and armored—carriages capable of independent movement. In contrast, non-self-propelled artillery is moved by vehicles and usually called towed artillery. Finally, artillery can be separated into tube (or cannon) and rocket artillery. The former utilizes a tube and pressure projection to drive a missile forward, while the latter uses jet propulsion to drive a warhead toward a target.

On the battlefield, artillery is used to provide either direct (when the target can be seen) or indirect (when the target is not visible to the firing weapon) fire against enemy troops, vehicles, or installations. Artillery may also be used for general bombardment, the interdiction of supply routes, illumination via flares and other pyrotechnic devices, the screening of friendly forces via smoke rounds, the delivery of atomic warheads, and defense against enemy air attack. At sea or in a coastal defense role, specialized artillery serves to destroy enemy ships or aircraft and to bombard land targets. Artillery units use a wide variety of specialized ordnance, including antipersonnel, antiarmor, nuclear, chemical, high-explosive, and proximity fuse.

Development

Field Artillery

Although modern artillery dates to the Battle of Crécy (1346), most armies before 1500 used their guns in sieges rather than on the battlefield. Great bombards battered down the walls of Constantinople in 1453, for example, and the French successfully used artillery to conduct sieges during the Hundred Years' War (1337-1453).

However, the promise of battlefield artillery could hardly be denied. Cannon already positioned for sieges proved crucial to French victories over the English at Formigny (1450) and Castillon (1453). Hussite leader Jan Žižka (c. 1376-1424) successfully used artillery carried on wagons during the Hussite Wars (1419-1434). The most prescient demonstration of field artillery was by French king Charles VIII (r. 1483-1498), who brilliantly used lightweight bronze artillery in campaigns against Italy in the 1490's and in a dramatic victory over the Spanish at Ravenna (1512).

These victories stimulated considerable innova-

tion in ordnance, and throughout the 1500's experts tinkered with a wide variety of ammunition. Most cannon fired solid cast-iron round shot, or solid iron balls; bombs, iron shells filled with explosive gunpowder; canisters, cans filled with small projectiles; and grape shot, a cluster of iron balls. The ordnance used depended on the target. Solid shot proved effective at long range and against fortifications, bombs were valuable against troops and horses in the open, and canister and grape shot were deadly at close range. Unfortunately, ammunition remained severely limited in most armies, and explosives were unreliable. Worse, the diverse experimentation of inventors created so many different types of guns and ammunition that consistent supply in many armies became almost impossible.

Artillery took a great leap forward in 1537, when Italian mathematician Niccolò Fontana Tartaglia (1500-1557) published the first scientific treatise on gunnery. Tartaglia's pioneering work discussed the basic principles of ballistics, proving that guns reached their greatest range when fired at an angle of 45 degrees and that all trajectories are curved. Tartaglia also developed the first gunner's quadrant and laid the foundation for the systematic scientific study of artillery. When Spanish scholars built upon Tartaglia's work in the 1590's and computed the first firing tables, artillery moved into a new age.

It was an age characterized by arms races between designers of guns and fortifications and between leaders seeking ways to use field artillery more effectively. Holy Roman Emperor Maximilian I (1459-1519) classified artillery in the 1490's as either siege or field and ordered the general use of iron shot by his gunners to simplify logistics. He also increased the amount of training his gunners received and placed his artillery men in a separate branch of the army to enhance their prestige. These efforts were followed by Holy Roman Emperor Charles V (1500-1558) and King Henry II (1519-1559) of France, who also standardized their artillery. The two rulers instituted, between them, a system of classification and battlefield use that lasted in Europe for almost three hundred years. The system defined three basic types of artillery pieces: long-barreled, thick-walled pieces designed for accuracy and long range, called culverin; lighter, shorter-barreled pieces that sacrificed range and accuracy to fire heavier projectiles shorter distances, called cannon; and short-barreled, thin-walled weapons firing very heavy projectiles at high angles called *pedrero*. The names of these weapons varied among nations, but the fundamental system of organization endured into the modern era, in which culverin are known as guns, cannons are known as howitzers, and the early pedrero are known as mortars. Most armies followed this system, reducing the number of calibers and standardizing ammunition and generally abandoning experiments with dangerous breech-loading artillery that loaded from the rear. Breechloaders had a tendency to explode when gases leaked from the breech during firing, a problem known as *obturation*. They became commonplace only in the nineteenth century, after technological advances had allowed gunners to seal breeches consistently.

Another quantum leap in artillery organization took place in the early 1600's, when King Gustavus II Adolphus of Sweden (1594-1632) established the foundations of modern field artillery. Adolphus ordered the development of a small, truly mobile leatherbound gun; made all gunners into soldiers subject to army discipline; and abandoned the widespread practice of hiring unreliable civilian gun crews. The king organized his new guns into regiments and assigned his artillery specific battlefield roles based on the weight of the projectile they fired: 24-pounders were for siege work, 12-pounders for field artillery, and 4-pounders for assignment to individual regiments. Later, Adolphus added 9-pound guns and organized them into batteries of five to ten guns behind his infantry. These changes were revolutionary. Adolphus used artillery en masse, rather than piecemeal, concentrating firepower at the decisive place on the battlefield. He was the first to allow artillery and infantry to fight together as interdependent supporting arms. Previously, artillery units had typically been placed in front of infantry, because the guns were unreliable and could not fire safely over the heads of friendly forces. Once battle was joined these guns were usually overrun by the general engagement and could not be fired again. In contrast, Adolphus's system allowed the guns to be fired continuously and to move from point to point as needed.

Adolphus's army also pioneered the use of cartridge ammunition, which consisted of properly measured bags of gunpowder bound to different types of projectiles. Cartridge ammunition made loading much faster and also increased the consistency of shot, because powder loads were measured out in advance instead of being thrown into guns in the heat of battle. Adolphus used these innovations to smash the Catholic League at the Battle of Breitenfeld in 1631. Other nations quickly moved to duplicate his powerful, mobile artillery.

Louis XIV (1638-1715) of France further advanced the nature and use of artillery when he organized the first permanent artillery regiment in 1671 and established a school of artillery in 1690. At his direction, French engineers perfected an elevating screw that simplified the process of raising and lowering barrels and developed a system of ropes, known as a *prolonge*, for pulling gun carriages. Most important, they refined the elongated priming tube, which was filled with powder and inserted into the touchhole of an artillery piece in order to ignite the charge inside the breech. Priming tubes made the process of firing both safer and more reliable and allowed gunners to reload faster than ever before.

These advances spurred even more improvements in artillery. In the 1690's the Dutch fielded the first true howitzers, and Swiss inventor Jean de Maritz (1680-1743) revolutionized cannon production in 1740 by casting them as solid pieces and then drilling out the bore. This proved far more precise than casting cannon around a hollow centerpiece, and it soon became standard practice throughout Europe. In England, Benjamin Robins (1707-1751) published *New Principles of Gunnery* in 1742, proving the value of elongated projectiles and rifled barrels and refining ballistic principles.

This explosion of new ideas and technology encouraged battlefield innovation, and Frederick the Great of Prussia (1712-1786) introduced the first horse artillery units in 1759. Gunners in these units rode the horses that pulled their gun carriages, and Frederick separated them from foot artillery formations, in which the gunners walked alongside their pieces. Horse artillery proved much faster than foot artillery and gave gunners the chance to stay abreast of advancing infantry and cavalry formations. They proved crucial to Prussian military successes in the mid-eighteenth century.

In France, Inspector General of Artillery Jean-Baptiste Vacquette de Gribeauval (1715-1789) designated artillery as field, siege, garrison, or coastal, and standardized all cartridges, limbers, ammunition chests, and tools. He then divided artillery pieces into battalion, brigade, and army guns; decreased their weight by as much as 50 percent; and began harnessing horses in pairs to move artillery more quickly. Gribeauval also introduced a calibrated rear sight and a graduated tangent sight to improve aiming, and he refined the manufacture of cannon and ammunition

TURNING POINTS

1346	The first definitive use of gunpowder artillery on a battlefield takes place at the Battle of Crécy.
1420	Hussite leader Jan Žižka makes innovative and effective use of artillery, with the *Wagenburg*, a defensive line of wagons and cannons.
1759	Frederick the Great of Prussia introduces the first true horse artillery units, which, because of their unprecedented mobility and firepower, are quickly adopted by other European nations to become a staple of most eighteenth and nineteenth century armies.
1873	German arms manufacturer Alfred Krupp invents one of the first practical recoil systems for field artillery pieces.
1904-1905	The effective use of indirect fire during the Russo-Japanese War spurs American and European leaders to adopt it for their own armies in order to defend their guns against counterbattery and infantry weapon fire.
1978	The United States begins production of the first precision-guided artillery munitions.

to reduce windage, or the space between ammunition and the walls of a cannon through which explosive gases can escape, by one-half. Gribeauval's modifications greatly increased the range and power of French guns, and when combined with reorganized gun crews and additional training upon its complete adoption in 1776, his system made French artillery the finest in Europe.

Chevalier Jean Du Teil (1738-1820) developed a theory for the employment of these weapons, which he articulated in his *De l'usage de l'artillerie nouvelle dans la guerre de campagne connoissance néccessaire aux officiers destinés a commander toutes les armes* (1778). Du Teil argued for the massed employment of mobile artillery on the battlefield and advocated the use of artillery to open breaches in enemy lines at close range. He also suggested the avoidance of counterbattery fire, because it held little hope of disabling enemy guns. These tactics were used with distinction by French emperor Napoleon Bonaparte (1769-1821), who massed artillery in grand batteries with great effect over the course of his career. Perhaps the finest example of Napoleon's use of mobile artillery came at the Battle of Friedland in 1807, in which aggressive French gunners pushed to within 60 yards of the Russian lines to support cavalry and infantry attacks.

Across the Channel, Englishman John Muller (1699-1784) called for lighter British field pieces in his *A Treatise of Artillery* (1757). Sir William Congreve, another Englishman, developed the famous block trail carriage in 1792. A single piece of wood with a center of gravity moved forward and a handspike at the rear, Congreve's carriage dramatically improved artillery mobility. Congreve also designed an accompanying limber and ammunition wagon, which seated gunners and, when joined with the new carriage, increased the speed of artillery movement. Henry Shrapnel's (1761-1842) spherical shell filled with lead bullets and surrounded by explosives increased the effectiveness of artillery systems. Shrapnel's invention allowed artillery units to fire antipersonnel rounds at long range against troops in the open. The charges exploded in the air, showering troops with lead bullets, or shrapnel, as they came to be called. All of these changes made the standard smoothbore black powder cannon, with a bronze barrel and a range of between 500 and 1,000 yards, more important than ever on the nineteenth century battlefield.

That importance was threatened by the growing prominence of rifled infantry weapons in the early 1800's. Rifling, or spiral grooves cut into the bore of a weapon, dramatically increased range. Although it made reloading more difficult, it also allowed infantry units greater range than did artillery and ultimately made smoothbore cannon obsolete. To compete, an Italian developed the first practical rifled, breech-loading cannon in 1846. Loading at the breech, or rear, of the cannon took less time than loading at the muzzle, and rifling allowed artillery to once again outreach infantry weapons. By the 1860's modern armies had incorporated rifled artillery with ranges of up to 4,000 yards, dramatically expanding the battlefield and making infantry assaults in the open practically impossible.

Most armies, however, were slow to adopt rifled artillery and infantry weapons on a large scale, and smoothbore weapons dominated the inventories of European and American armies well into the nineteenth century. This resistance to change stemmed from the fact that rifled weapons took longer to load and required more training to operate, and from a stubborn attachment to tradition among officers who did not understand how the greater range of rifled weapons demanded fundamental changes in battlefield tactics.

That understanding finally came after the Franco-Prussian War (1870-1871), in which Prussian forces equipped with rifled steel breech-loading artillery decisively defeated the French. This new artillery, manufactured by the legendary arms maker Alfred Krupp (1812-1887), utilized steel and advanced gun design to produce weapons with range far greater than that of any others in the world. Its pivotal role in the Franco-Prussian War forced other nations to play catch-up, and by the 1890's Krupp's steel breechloaders were the dominant artillery weapons worldwide.

These new guns fired extremely heavy shells, demanding more research into the problem of recoil, the rearward movement of guns caused by their fir-

ing. Scientists experimented with hydraulic cylinders attached to gun barrels to reduce recoil on field artillery but with mixed results. Trail spades and brakes were still required on field guns to keep them from moving too far out of position when fired, until the French developed the revolutionary M-1897 75-millimeter field gun in the 1890's. The French "Seventy-five" had a long recoil cylinder capable of reducing recoil to a fraction of its former strength and could fire thirty rounds a minute to a maximum range of 8,000 yards. It represented a quantum leap in artillery technology, driven by the shame of French defeat in the Franco-Prussian War.

Other late nineteenth century improvements in artillery included the development of smokeless powder, high explosive rounds, better fuses, and, by the 1890's, the widespread use of metallic cartridges for ammunition. Each invention represented an enormous leap forward in destructive power and range for artillery weapons, and armies struggled to develop new ways to utilize them. Most organized their big guns into a separate artillery branch and placed them at the disposal of division- or corps-level commanders, because the great range of artillery prohibited its use too close to the battlefield. That distance, however, required gunners to learn how to use artillery in an indirect role, supporting units by firing at targets they could not see, and the limited communication technology of the period made such a role difficult at best.

Karl G. Guk (1846-1910) of Russia laid the foundation for effective indirect artillery fire in 1882, calling for forward observers equipped with compasses and utilizing aiming points to direct artillery fire, and gunners soon abandoned the idea of independent aiming and fired at targets as a battery to maximize their chances of hitting a target. Ironically, Guk's own army suffered the first effective battlefield use of indirect aiming when Japanese forces destroyed Russian artillery with counterbattery fire during the Russo-Japanese War (1904-1905).

These events set the stage for World War I (1914-1918), in which artillery played a decisive role in almost every theater of operation. Commanders desperate to break the stalemate of trench warfare ordered long, sustained bombardments of enemy positions, using larger and larger guns and more powerful ordnance. Field commanders pioneered the use of aircraft as observation platforms for indirect fire and used sound and flash ranging to spot enemy batteries at long range. Because observers could not always see enemy positions or contact friendly artillery, they developed rolling barrages that moved fire forward in front of advancing infantry on a preset timetable. Some units also practiced unobserved firing, using their guns to hit areas in which enemy activity was suspected, and predicted fire, in which units aimed without spotting rounds and unleashed surprise barrages on enemy positions. During World War I artillery units used poison gas shells on a large scale, began using vehicles and railway cars instead of horses to move their heavy guns, and experimented with the first self-propelled artillery.

During the interwar years refinement of the radio finally allowed forward observers to call in accurate indirect fire at great range. In the United States these efforts culminated in the development of the Fire Direction Center (FDC) during the 1930's. A centralized command post connecting multiple batteries, the FDC could by 1941 mass four battalions of artillery on one target within five minutes. This ability to quickly mass artillery fire against various targets gave the United States a tremendous advantage on the battlefield and served as a model that other countries quickly sought to emulate.

In World War II (1941-1945), artillery again proved decisive, accounting for more casualties than any other family of weapons. Combatants used thousands of guns, towing them with horses and moving others with vehicles or on self-propelled carriages. These guns grew progressively in size and destructive power. The Germans, for example, developed an 88-millimeter gun that served throughout the war as an antiaircraft, antitank, and artillery weapon. The British fielded their famous 25-pounder, which fired a 3.45-inch projectile 13,000 yards, and the United States developed a towed and self-propelled version of the 155-millimeter gun and howitzer. To observe fire from these new weapons, armies added aircraft to artillery units and promoted widespread use of the radio, allowing close battlefield support for ground forces. Artillery units also diversified, as the threat

from enemy tanks and aircraft demanded specialized weapons to defeat them. Antitank artillery units fired hollow charges or discarding sabot rounds through tapered barrels to destroy tanks with high velocity rounds. Some armies even fielded self-propelled antitank guns called tank destroyers or guns as large as 240 millimeters, called assault guns, for close support of infantry. These guns were joined by antiaircraft artillery designed to defend against enemy air attack. A revolutionary new technology in this field was the variable time (VT) fuse, which was fielded by the United States in 1941. The VT fuse allowed gunners to detonate rounds at a preset range, throwing shrapnel in the path of enemy aircraft rather than hitting them directly. It was especially important in defending U.S. ships against Japanese air attack in the Pacific.

After World War II, artillery units struggled to adjust to the nuclear age. Tactical nuclear artillery became a reality in 1953, when the United States fired an atomic warhead from a 280-millimeter gun named Atomic Annie in Nevada. The United States eventually fielded atomic warheads for 155-millimeter howitzers as well, and the Soviet Union quickly followed suit.

Library of Congress

The Krupp arms manufacturing company's exhibit of a massive cannon at the 1893 Chicago World's Fair.

Within conventional artillery, the United States found that during the Korean War (1950-1953) many units were handicapped by guns that could not traverse 360 degrees. By the 1960's the United States had developed a new family of self-propelled guns. These new guns, with fully enclosed crew shelters, could fully traverse and elevate to 75 degrees. In response, the Soviet Union also revamped its artillery, fielding a 203-millimeter field gun with a 31,900-yard range, a 152-millimeter field howitzer, and new self-propelled guns.

The United States also found a need for lighter pieces that could be carried by aircraft to support airborne and air mobile forces. In the 1950's it therefore developed a 75-millimeter pack howitzer and 105-millimeter and 155-millimeter towed howitzers suitable for air transport. These guns were used with great effect during direct American involvement in the Vietnam War from 1965 to 1973, when they were often repositioned with helicopters.

As the Vietnam conflict ended, the 1973 Israeli-Arab October War saw the first widespread use of remotely piloted vehicles (RPVs) for battlefield obser-

Army Times Publishing Co.

A gun crew of the Sixty-fourth Artillery Battalion, Twenty-fifth Infantry Division, fires a 105-millimeter howitzer on North Korean positions in 1950.

vation and artillery spotting, and spurred yet another outburst of technological innovation. Advanced armies had already experimented with ordnance that separated into a greater number of individual warheads called submunitions and with rocket-assisted warheads that gave traditional artillery greater range. During the 1970's they also moved into the realm of laser-guided projectiles when the United States fielded the Copperhead 155-millimeter cannon-launched guided weapons system. The Copperhead gave the United States unprecedented targeting accuracy and paved the way for the development of "fire-and-forget" artillery shells in the 1980's. These "smart" munitions carried onboard target-seeking sensors that allowed individual warheads to seek out and destroy enemy tanks, a capability desperately needed by outnumbered U.S. forces in Europe. From the 1960's onward the United States also pioneered the use of radar for counterbattery artillery fire and developed the means to detect the exact location of enemy artillery by computing the trajectory of their shells backward to the point of origin.

All of these advances, along with the use of next-generation RPVs and sophisticated fire-control computers, were validated during the Gulf War (1990-1991). In this conflict U.S. artillery units devastated Iraqi positions with advanced and traditional munitions that fired with unprecedented accuracy and played a key role in keeping Allied casualties low, speeding coalition forces to victory.

As armies evolve into the twenty-first century, artillery promises to play a vital role on conventional battlefields, with computers and advanced ordnance producing faster rates of fire over greater ranges with astonishing accuracy. Like their counterparts in centuries past, however, the artillery of the future will have to balance performance with speed of movement, lest it find itself unable to deploy to trouble spots around the world in a timely manner.

COASTAL ARTILLERY

From their inception cannons have been used to defend coastal installations against naval attack. The English, for example, placed guns in Dover as a protection against the French in 1370, and Henry VIII (1491-1547) ordered fortifications and coastal guns positioned in all major English coastal towns from 1538 onward. These coastal guns generally evolved in tandem with field artillery, with the important exception of their size. Because coastal guns were not required to move, they were designed to be the largest and most technically advanced artillery weapons in the world. Guns as large as seventeen tons protected the Dardanelles from attack as early as the 1400's, and around the world coastal guns ranged from standard sizes to leviathans that would be impossible to deploy on land or aboard ship.

By the nineteenth century, most advanced countries boasted coastal fortifications equipped with these cannons in brick and stone emplacements. The United States joined in this effort by building twenty-

four forts equipped with more than 750 guns along the Atlantic coast between 1806 and 1811. By the late 1800's, breech-loading guns were dominant, with guns placed in disappearing barbette carriages and hidden behind or beneath concrete walls.

World War I prompted yet another burst of coastal gun emplacements, with guns as large as 12, 14, and 16 inches finding their way into the arsenals of the world's armies and navies. These large guns were necessary to defeat heavily armored warships, and designers went to great lengths to find ways to minimize their great recoil and to develop mountings to support their enormous weight. Others extended the range of these large guns by using longer barrels and experimented with rail-mounted guns that moved from one coastal position to another. In the long run these guns proved expensive and far less effective than ship-mounted artillery, and their vulnerability to air attack led most nations to abandon them after World War II.

NAVAL ARTILLERY

At sea cannons had, by the mid-1400's, become vital weapons in the navies of the world. Like their cousins in coastal artillery, shipboard cannons developed roughly in parallel with guns on land. The one exception to this rule was the gun carriage. Early cannons were attached to the ship itself, but by the 1500's designers introduced wheels to carriages that supported guns and allowed sailors to move them. These truck carriages were held in place by breeching ropes that constrained the cannon but still allowed recoil to move them backward. They therefore spared the hull of the ship the full force of recoil and presented gunners with a means to maneuver the gun back into position for firing. This simple technology prevailed until well into the nineteenth century and helped smoothbore muzzle-loading cannon to dominate naval warfare for three centuries.

These cannon were arranged along the gun decks on both sides of sailing ships and fired through ports in the side of the hull, which could be closed in inclement weather. Naval architects designed several classes of ships to carry cannon, from small and fast frigates to enormous ships of the line, which boasted as many as one hundred or more guns. These ships generally fired standard artillery rounds and sought to deliver them simultaneously in great broadsides, when all guns on one side of a ship fired at the same target. Although ordnance changed relatively little prior to the 1850's, the Scottish did introduce a specially designed carronade in 1778, which sacrificed range to fire a large-caliber round from a light gun. The British Royal Navy adopted the carronade for close-quarter action in the late 1700's, and many other nations quickly followed suit.

The relative stasis in naval gun design was shattered in 1858, when the French launched *La Gloire*, the world's first ironclad warship. The British responded by building their own armored warship, the HMS *Warrior*. In the 1860's they proved that armor-piercing shells fired at high velocity were far superior in defeating armor to much heavier solid shot traveling at slower speeds. This discovery induced navies around the world to adopt spherical shells tipped with metal, known as armor-piercing rounds, and the days of round shot were finally over.

Naval designers then had to decide where to place their armor-piercing guns and how best to protect them with armor plate. Some chose to place their guns at either the front or rear of their ships, while others adopted the sponson, a semicircular platform that allowed guns a 180-degree traverse both fore and aft. The ultimate solution came when designers produced revolving turrets that allowed guns to fire in almost any direction. These turrets, first deployed on the Danish *Rolf Kraki* in 1861, freed ships from linear tactics and allowed attacks from a variety of directions. When coupled with steam power, which freed ships from reliance upon the wind, they completely revolutionized naval warfare.

By 1874 the English were deploying ships with 12.5-inch muzzle-loaders in turrets weighing as much as 750 tons, and the growing size of turrets required hydraulic and mechanical power to rotate them. As breech-loading guns became dominant in the late 1800's, designers sank turrets down into the hulls of ships and used compressed air and water to cleanse gun barrels, interlocking doors to separate ammunition storage from firing compartments, and pressurization to reduce the risk of accidental explosion. They also developed machines to take over the process of loading ammunition, and by World War I

battleships carrying guns as large as 15 inches were recognized as the dominant weapons of their era.

These ships required sophisticated targeting systems to account for the great range of their guns, as well as for their own movement and the movement of their targets. Naval designers therefore placed fire-control centers high up in the masts and control towers of ships to allow a good view of targets and gave these centers control over the firing of guns in all turrets. During and after World War I these fire-control centers were aided by observation aircraft and fired at such great range that they had to account for the curvature of the earth in their firing computations.

During World War II battleships reached their zenith, when the United States and Japan utilized ships with guns as large as 16 and 18 inches, respectively. Rather than playing a primary role in the naval battles of the era, however, these great ships were eclipsed by aircraft as the dominant weapon on the high seas. They served primarily as antiaircraft and shore bombardment platforms and were retired after the war as aircraft and guided missiles replaced them. Although U.S. battleships were brought out of retirement so their great guns could bombard distant land targets during the Korean War (1950-1953), the Vietnam War (1961-1975), and the Gulf War (1990-1991), as of 2000 there were no battleships in the active inventory of any world navy. Ships that continue to mount heavy guns generally do so as a means of self-defense against small ships or aircraft, and the guns are usually no larger than 5 inches. They are, however, guided by radar and boast extremely fast rates of fire, seemingly indicating that naval artillery will endure well into the twenty-first century.

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Lance Janda

Tanks and Armored Vehicles

Dates: Since 1898

Nature and Use

Although primitive designs for horse-powered, armored combat vehicles date back to the fifteenth century, it was not until the nineteenth century that they actually took a cohesive shape. As early as 1898 the U.S. Army had designed and built a motorized gun carriage, which, although fitted with only an armor shield, is considered to be one of the world's first armored cars. This steam-propelled vehicle, equipped with a .30-caliber Colt machine gun, continued to be built on a small scale into the twentieth century. During the Second Boer War in South Africa (1899-1902), the British army also employed armored trailers and steam traction engines, notably Fowlers, for hauling supplies and guns. These original armored vehicles were obviously limited and were not recognized by the military authorities of any nation until the outbreak of World War I (1914-1918).

Colonel Ernest Swinton (1868-1951), who originated the tank in 1915 and fought in the Boer War, saw the potential for modern firepower and its devastating effect on men in the open. As an officer of the Royal Engineers, he was familiar with mechanical transport, including petrol-engined, Caterpillar-tracked vehicles such as those that had been developed previously in both England and the United States. In October, 1914, Swinton recognized that the line of fortified trenches, which stretched from the North Sea to the Swiss frontier, was unlikely to be breached by conventional means of attack by infantry and cavalry. Barbed wire entanglements, secured by intensive fire from artillery and automatic weapons, made a war of movement impossible and precluded any decisive action. Swinton sought a radical solution to the trench deadlock and used the American Holt tractor design, then being used in France, as a starting point. The track was the key, he believed, as it made cross-country movement on rough ground easier. Swinton encountered a great deal of opposition, however, from military authorities who were skeptical about untried methods. The Royal Naval Air Service had sent armored car squadrons to the Calais area as early as September, 1914, to protect the advanced improvised landing strips they had set up for their air squadrons supporting the Naval Brigade. These vehicles were not intended for offensive use, however, and they were largely confined to roads.

In July, 1915, Swinton was sent back to London from his post in France to become secretary of the Dardanelles Committee of the Cabinet. He stood at the center of the group of politicians, officials, soldiers, and technicians whose aim was to create what became known as the tank. Perhaps more important than Swinton's contribution to production of the tank was his original document outlining tank tactics that were used for years to come. His memorandum described the characteristics, capabilities, and limitations of tanks and defined their basic use, in conjunction with infantry and artillery, to crush enemy wire, to cross trenches, to destroy machine guns, and finally to advance so deeply into enemy defenses that their guns could also be tackled. Swinton also envisaged the need for tanks to communicate by telephone or wireless both with each other and with their supporting arms. In Swinton's opinion, tanks were merely an auxilliary to infantry, and their independent operation was, in his mind, inconceivable.

The first tanks ran trials in January, 1916; they first entered battle in September of the same year, at Flers-Courcelette, in northern France, where forty-nine vehicles were used to add impetus to a flagging infantry action. Success was limited, however, due to the limited number of tanks available, the lack of crew experience, and the vehicles' inherent mechanical limitations. However, some of the British army staff were convinced of the tank's value, and orders

increased. The tank's real, or perhaps more famous, introduction came in November, 1916, at Cambrai, in northern France. For the first time, a joint tank-infantry operation had been carefully planned to fit the strengths and limitations of armored vehicles. The attack was made on a seven-mile front, and the tanks attacked in three waves; each tank worked with the tank behind it to cross the three lines of the German defensive system. Smoke shells were fired to camouflage the tanks' arrival, and, when the smoke cleared, the Germans were greeted by the large metal vehicles, emerging from the morning fog with guns blazing. So complete was the surprise that some of the German units panicked and fled; however, Cambrai was not an absolute victory for armored vehicles. After the first objective had been achieved, the infantry began to lose contact with the tanks. The tank units were left alone to face a German artillery battery, and many tanks were destroyed. Even though the tanks kept breaking through enemy lines, because there was no infantry there to hold the ground, their gains were useless. The armored attack on Cambrai was significant in that, in one day, it opened a large hole in the German defense system. Only 4,000 British soldiers died at Cambrai, a greater achievement than the 1917 Passchendaele Offensive, which took four months and 400,000 casualties. Although the tank restored mobility to the battlefield and was touted as the answer to the stalemate caused by the machine gun, barbed wire, and entrenchments, many skeptics remained to be convinced of the advantages of armored warfare.

DEVELOPMENT

The first tank prototype was called Mother. The lozenge-shaped frame was such that the lower run of the track in contact with the ground approximated the shape and radius of a wheel with a 60-foot diameter. It was calculated that this shape would comfortably cross a 5-foot trench or run up a 4.5-foot vertical parapet. It was in 1916 that the term "tank" first came into use to describe what had hitherto been described as a "landship." Mother's success led to the first tank, known as the Mark I, which was identical to Mother except that it was constructed with armor plate instead of boiler plate. The Mark I, used at Flers-Courcelette, was armed with a 6-pounder (pdr) gun and three Hotchkiss machine guns. Improvements to the Mark I followed in subsequent models: Wider track shoes were fitted at every sixth link, armor was slightly increased, and a raised manhole hatch was placed on top to protect the driver. The wheeled cart that trailed the earlier model was also discarded, because it was ineffective on the muddy battlefield.

TANKS IN WORLD WAR I

The first tanks had crews of eight. In these vehicles, steering and gear changing were cumbersome and tiring operations that placed considerable strain on the vehicle's transmission. By the time the Mark V model had been developed, four-speed gearboxes were used, and the gears could then be changed by one man. The Mark V's engines were much more powerful, and once they were made to be air-cooled, they became immune to frost. The extreme weight of the early Mark models made it impossible to control the steering and braking by hand power alone; hydraulic lines were introduced to allow control of the massive vehicles. Its armor was also increased, and a rear-firing machine gun was added.

When the United States entered World War I, it jointly produced the Mark VIII with the British. Prior to this time, however, French Renault light tanks and British Mark V tanks were used. German tank projects met with the same type of skepticism that had been prevalent in Britain. Although the tank was used in army exercises, its value in battle was not appreciated by the German General Staff, who considered tanks suitable only for secondary tasks, such as frontier patrol work, gun transport, and reconnaissance. A German infantry force mounted in trucks did execute a lightning strike as part of General Erich von Falkenhayn's (1861-1922) offensive against Romania in 1916, and the lessons were not lost on the German General Staff.

THE INTERWAR YEARS

In the post-World War I era, the development and organization of mechanization was viewed as a possible decisive factor in warfare. Military mechanized

vehicles could be divided into the following types: armored fighting vehicles, armored carriers, and armored tractors. The tracks themselves were still of a very primitive type, no more than a series of plates joined together by hinge pins. These tracks were laterally rigid, so that steering was accomplished by skidding the tracks in contact with the ground. The pins and plate wore out very rapidly. However, the tracks were effectively sprung in 1922, increasing the life, as well as the expense and difficulty of manufacture, of the track. Despite these innovations, by the 1930's the British army had returned to traditional dogma and entered World War II with a defensive doctrine.

Hulton Archive/Getty Images

A tank of the type the British used successfully against the Germans at Cambrai in 1917.

The British military thinkers J. F. C. Fuller (1878-1966) and Sir Basil Henry Liddell Hart (1895-1970) restored the strategic emphasis on mobility and the use of armor in war. In 1919 Fuller asserted that the tank could completely replace the infantry and cavalry, and that artillery, in order to survive, should be developed along the lines of the tank. Military perfection, he believed, no longer could be based on numbers of soldiers: Technological advances such as the internal combustion engine had rendered human masses insignificant in the age of modern warfare, negating the need to literally destroy the enemy's armies in the field. As Fuller argued, armored forces could paralyze, demoralize, and cause the disintegration of armies by striking at their rear communications and command systems. With slaughter and destruction reduced, he believed, war would become both more humane and more rational. Fuller's work soon attracted attention, and he acquired a faithful disciple in Hart, who in 1922 was converted to Fuller's vision of armored warfare.

By the late 1920's the British government had become increasingly concerned about the dilapidated condition of its army, resulting in experimental trials with mechanized and mixed units, held between 1927 and 1931. On the Salisbury Plain in August, 1927, exercises were conducted with an incongruous force of armored cars, various-sized tanks, and cavalry and infantry units. Although problems such as constant congestion at bottlenecks were ubiquitous, the trials demonstrated the mobility advantages inherent in mechanized strategy. In 1931 an exercise was conducted by the First Brigade Royal Tank Regiment. The force was composed entirely of tracked vehicles, and, using a combination of radios and colored flags for communication between the tanks, they functioned in unity and precision. This period of experimentation and development soon lost impetus, however, as the army's leadership became increasingly conservative. This fear of change discouraged

further innovation and experiment in armor. Even after the rise of Adolf Hitler (1889-1945) and British recognition of the German continental threat, little was done to improve land forces, as such action was politically unpopular and financially difficult to reconcile with expenditure on the British navy.

Germany had always believed war to be a useful instrument to ensure national security and to foster Germany's higher status in Europe. Therefore, although antiarmor elements existed in Germany, it was on the whole a more conducive environment for armored warfare. Mechanization of the army was part of a more encompassing program, and the creation of tank formations was initially a subordinate element in improving overall mobility. Tank warfare became increasingly important and by 1929 formed the main thrust of army modernization. The turning point had come in 1927, when Germany concluded that the principles of tank warfare would need to be reconsidered, embracing the concept of decision-oriented, operationally independent armored warfare.

With the rise of National Socialism in the 1930's, the party's leader, Hitler, guaranteed rearmament, and his new government immediately began to fulfill this promise. Armor doctrine found fertile ground, and supporters in the government backed the development of armored forces against the skepticism of more conservative officers. Light- and medium-model armored vehicles equipped with machine guns, an armor-piercing gun, and radios, and capable of speeds of up to 25 miles per hour, began to appear in 1938 and 1939 as the Panzer III and Panzer IV. At the outbreak of World War II in September, 1939, six Panzer divisions existed and were being trained in the technique of the Blitzkrieg, literally "lightning war," the violent and surprise offensive by which Poland was overwhelmed in 1939.

The Spanish Civil War (1936-1939) set the stage for the armored warfare of World War II. The Republicans, supported by France and the Soviet Union, followed French armor doctrine and distributed their tanks within the infantry formations. They employed the tanks in support of infantry frontal attacks, forcing the vehicles to move at walking pace and providing lucrative targets for the Nationalist antitank gunners. The Germans, who supported the Nationalists, persuaded them to concentrate their armor, group it with motorized infantry and mobile artillery, and deploy it where the enemy was weak, in fast-moving attacks on narrow fronts. This strategy was effective and played a significant role in the success of the Nationalist offensives of 1938-1939 that led to their victory. The French and the Russians both drew false conclusions about tank strategy after the war. Both nations believed that the antitank gun had mastered the tank and that tank formations could not play an independent operational role in future waging of war. The Germans quickly proved them wrong.

TANKS IN WORLD WAR II

On August 1, 1939, Germany invaded Poland, beginning the conflict that evolved into World War II. By this time the German army understood that tank forces could not act alone. They prepared their tank force for penetration, but then attached to it a motorized support of infantry, artillery, and engineers. Germany used the same tactic of rapid, self-supporting mobility after defeating Poland, attacking France in May, 1940. In France the German army was also aided by air support, which proved to be another effective strategy. It is significant to note that, although France had more tanks than Germany, the defensive doctrine that the French applied to their use failed to hold out against the lightning offensive movements of the German Panzer divisions. France was defeated in June of 1940. Germany then turned and attacked Russia in June, 1941. After the initial German success of rapid, armored pincer movements, the Russians developed the T-34 tank. It was armed with a long, high-velocity 76-millimeter gun, which shredded the German armor. The T-34 itself seemed immune to the Panzer's own shells. Their top speed of 33 miles per hour, over the Panzer's 25 miles per hour, on a wider-tracked base was also indispensable in the mud and snow of the eastern front. After gaps had been created in the front, the Russians sent in their tank forces, composed mostly of the formidable T-34, to enlarge and expand the breakthrough. Once the Americans joined the battle on the western front, the most commonly used vehicle was the Sherman tank, which helped turn the tide on the Germans in North Africa and later in France.

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M-1A1 Abrams tanks in Iraq during Operation Desert Storm.

Tanks in Modern Conflicts

The Israeli-Arab October War (1973) displayed a new style of armored warfare. The Israeli army charged into the Suez Canal area in small groups of tanks, unsupported by reconnaissance, infantry, artillery, or air forces. The Egyptians, who were armed with RPG-7 rocket launchers and Sagger antitank guided missiles (ATGM), soundly defeated the Israeli forces. This initial defeat, however, did not, as many thought, portend the end of the heavy, slow-moving tank. After the first disastrous days, the Israelis restored the mobility of their tank formations; their ultimate success was primarily due to the reintroduction of all arms cooperation. Infantry was vulnerable to artillery and machine-gun fire. Artillery was vulnerable to attack by tanks and infantry. Tanks also were vulnerable to a variety of antiarmor weapons. When used together, however, each force compensated for the weakness of the other. The tanks destroyed enemy armor and machine guns; infantry cleared antiarmor weapons and held ground; and artillery, secure behind the armor and infantry, neutralized enemy antiarmor weapons and artillery. The effective use of tanks, therefore, had to be adapted to the changing technologies of armor and antiarmored warfare.

There have traditionally been two methods of defeating the thick, rolled homogeneous armored steel that has generally protected tanks. Kinetic energy (KE) attack involves firing a high-velocity projectile from a large-caliber gun. In flight, the light outer jacket, or sabot, of the projectile falls off, and the remaining kinetic energy is concentrated in its smaller-diameter core, made up of high-density material. The core then forces its way through the armored plate. Chemical energy (CE) attack uses an explosive charge to create energy to defeat the armor plate. The shell's explosive charge creates and directs a narrow, high-pressure jet that forces its way through the armor plate.

In the mid-1970's and early 1980's, three new developments in armor technology appeared to counter traditional antitank weapons. It had been known for some time that some materials, such as ceramic or glass, severely degraded shaped charge jets. The Soviets thus developed simple laminate armor for pro-

tection against both KE and CE attack; the T-72, for example, was fitted with this armor as well as with ceramic inserts in cavities within the cast turret armor. Another development was explosive reactive armor, developed by the Israelis and consisting of small panels bolted to the exterior of the tank. When struck by a high explosive antitank (HEAT) projectile, the explosive detonated, driving the plates apart and disrupting the shaped charge jet. The most significant of the new armors was Chobham armor, a complex laminate developed by the British and first publicly shown in 1976. It was composed of spatial layers of various materials, such as steel ceramic and aluminum, and was reported to give significantly better protection than any other armor against multiple attacks by KE and CE warheads. Other innovations included the fitting of tanks with explosion-suppression systems and the substition of combustible hydraulic fluids for electronic systems. As shell penetration of armor caused possible ruptures in hydraulic lines, internal catastrophic explosions from hydraulic vapor became common. Moreover, ammunition was placed in separate, protected bin compartments. The latter two concepts were practiced by the British. In the Middle East wars during 1970's and 1980's, British-designed tanks proved difficult to ignite.

AP/Wide World Photos

Armored vehicles are towed into the former Yugoslavia by British Chinook helecopters during the 1999 Kosovo crisis.

Soviet revisions in operational doctrine at this time saw the evolution of Operational Maneuver Group (OMG) concept. This involved the employment of self-contained, highly maneuverable, heavily armored formations early in an offensive. OMGs would, theoretically, attempt to punch their way through the defenses of the North Atlantic Treaty Organization (NATO) before they were fully developed and strike deep into the NATO rear, with the intent of causing chaos and the rapid collapse of the defense. The OMG concept evolved from the Soviets' experience in World War II, but the Israelis in the 1956, 1967, 1973, and 1982 wars used a similar doctrine most successfully. Soviet tanks, such as the T-64, T-72, and T-80, had 125-millimeter guns, automatic loaders, and integrated fire-control systems to permit rapid, accurate, and lethal fire. These tanks also had multibarreled grenade dischargers, which were capable of firing smoke grenades that degraded the performance of the new thermal imaging sight technology. Although the So-

viet threat soon subsided with the disintegration of the Soviet Union in 1989, a new threat quickly took its place.

The Gulf War (1991) saw the most technologically advanced ground combat of the century. The American M-1A1's, British Challengers and Chieftains, and French AMX-30's were shipped in to combine the best old-fashioned hardware with modern targeting computer software. The American M-1A1 is a rolling fortress that radiates a menacing power. The four-man tank weighs 63 tons and measures 26 feet long. The tank's primary weapon is a 120-millimeter M68E1 smoothbore cannon that fires M-728 armor-piercing shells up to a distance of 2.5 miles while moving at 20 miles per hour. Other armament includes two 7.62-millimeter M-240 machine guns and one .50-caliber Browning M-2HB machine gun. With its powerful 1,500 horsepower gas turbine engine, the M-1A1 has a top speed of about 42 miles per hour and consumes fuel at the rate of 6 gallons per mile. The M-1A1 has a range of about 288 miles. It carries forty rounds and is equipped with an advanced carbon dioxide laser rangefinder, thermal viewing for night fighting, and a better suspension than earlier versions. The M-1A1 is considered the most sophisticated and capable main battle tank in the world. Even the Iraqi use of the Soviet T-72, a generation behind the M-1A1 in development, could not make the battle any real test for the coalition forces. Although the preceding air campaign created highly favorable conditions for the ground forces to accomplish their mission, it was ultimately the ground forces and their tactical air support that destroyed the Iraqi army.

With the growing emphasis on airpower in the 1990's, particularly in Bosnia and Kosovo, the true potential for armored warfare remained unrealized. As in the first tank battles, it remains clear that there must also be an armed force to hold any ground that is gained. Tanks and armor, therefore, will always have their place in the waging of war.

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Aaron Plamondon

Aircraft, Bombs, and Guidance Systems

Dates: Since 1900

Nature and Use

Aircraft possess great mobility and firepower, which enable them to affect tactical or strategic situations decisively. They can circumvent both enemy and environmental obstructions to army and naval movement. Their speed and range can render any enemy position vulnerable to surveillance or attack. Even slower aircraft such as helicopters move with a speed and agility that ground vehicles cannot match. Technological progress and military developments have created or eliminated various aircraft types. These factors made it necessary that some aircraft design features be optimized in order to produce the best machines to fly specific air missions. Furthermore, although aircraft have grown increasingly important to any military endeavor, like all weapons they are tools whose effectiveness depends on the situation and combat objective.

Types of Aircraft

Airships, also called dirigibles, existed at the beginning of the twentieth century. These large, specially built balloons had propeller engines and small wings at their stern that allowed controlled flight. In 1900 Germany's Count Ferdinand von Zeppelin (1838-1917) introduced cigar-shaped, metal-framed versions called rigid dirigibles or, after the builder himself, zeppelins. Already in operation were more sausage-shaped airships with less rigid frames, later nicknamed blimps. Since airships could remain airborne for long periods, they served best in observational roles. However, their expense, large size, support demands, slow speed, clumsy handling, and hydrogen interiors combined to make them unsuitable for direct combat.

The airplane first flew in 1903, and by 1911 primitive models were flying in combat. Airplanes have been the most prevalent and successful type of military aircraft, reaping the windfall of successive technological advances and serving in a wide variety of roles. Improvements in thrust allowed for the evolution of piston engines and propellers to jet engines with afterburners. Aerodynamic design advanced from fabric biplanes to titanium and composite-alloy swept-wing planes. The exigencies of World War I (1914-1918) determined the basic airplane types and design philosophies for air combat: fighter, attack, and bomber.

Fighters, Attack Planes, and Bombers

Fighters enabled an air arm to meet its most important mission, air superiority, by shooting down aircraft and thus defeating the enemy's air effort. As daytime fighters evolved from World War I, the best designs possessed an optimum compromise of speed, climbing ability, acceleration, and maneuverability. Further, they required the best air-to-air weaponry, whether that was powerful machine guns or guided missiles. Thus, sheer performance and hitting power enabled fighters to outperform and shoot other planes, especially in the maneuvering duels against other fighters known as dogfights. Expanding requirements and technological developments bred variations. Radar drove the creation of night fighters, which, during World War II (1939-1945), were often planes lacking optimum fighter performance but possessing room for electronic gear and the extra crew to operate it.

The Cold War's technology developments and military conditions bred more fighter variants. Interceptors such as the U.S. F-106 and the Soviet MiG-25 stressed speed and climb over maneuverability because they required the potential to attack incoming nuclear-armed bombers quickly. Anticipating the

Popperfoto/Getty Images

The German Zeppelin airship LZ-3 in 1909.

effect of higher speeds, onboard radars, and guided air-to-air missiles upon aerial warfare, the leading air arms reduced emphasis upon traditional air fighting skills such as dogfighting and gunnery. Further, because fighters had during previous wars performed well in other missions, such as ground attack, air leaders pursued a more versatile, cost-effective force by building multipurpose fighters, "fighter-bombers," or fighters adapted to other missions. Although planes such as the U.S. F-4 achieved some success in this regard, they were still not the best at all missions. Indeed, conflicting mission requirements, jet performance extremes, and radar-guided missiles' space and cockpit task demands rendered impossible the optimization of traditional day fighter, interceptor, and attack plane needs in one design. Further, this produced very expensive planes. The United States, which most assiduously pursued this aim, built cheaper planes with more traditional air combat strengths, such as the F-16, to supplement its forces. Even so, the U.S. Navy and Air Force also expanded these planes' roles.

Attack planes required similar characteristics, but not at the expense of extra range, ruggedness, and bomb delivery prowess. Beyond these specifications, attack plane designers faced choices in meeting a variety of force application missions. Attack planes supported the fighters' air control mission by flying offensive counterattacks against enemy airfields. They conducted interdiction campaigns against enemy ground forces by attacking reserve units, supply lines, and command or communications facilities. They flew close air support missions against enemy troops at or near the battle front, and they supported naval actions by attacking ships and dropping mines. Finally, attack planes hit strategic targets such as cities, command centers, and industries if their range allowed it. Specific targets were

widely varied and included runways, buildings, ships, troops, bridges, fortifications, and tanks. Target variety and diverse attack environments created different carriage specifications for bombs, torpedoes, missiles, guns, and nuclear weapons. Day, night, bad weather, and low- or high-altitude attacks also required design changes and different onboard equipment.

Through World War II, attack planes usually carried two crew members, a pilot and gunner, and they were powered by either one or two engines. Many possessed the structural strength and aerodynamic stability necessary to conduct dive-bombing attacks, which offered greater bombing accuracy. Others carried torpedoes. During both world wars, fighter planes also flew attack missions; and in World War II, several types, such as the U.S. P-47, excelled in this role.

However, the ever-widening performance spectrum often necessitated greater specialization to handle different nations' specific power projection needs. Jet fighters were also adapted to fly attack missions, including defense suppression raids against surface-to-air missile (SAM) and antiaircraft artillery (AAA) sites. Strike planes such as the North Atlantic Treaty Organization's (NATO's) Panavia Tornado emphasized speed and bomb carriage for deep interdiction attacks. Also, they often carried two crew members to handle the increasingly complex array of radars, computers, infrared sights, and guided bombs required for day, night, and all-weather attacks. Other attack planes such as the U.S. A-7 also carried more sophisticated avionics but were single-seat, jet-age dive-bombers. Finally, army air support demands generated propeller and jet planes that flew more slowly, carried special armament, remained airborne longer, or operated from austere surroundings. The United States even modified cargo planes to serve as orbiting attack gunships.

Because bombers carried more weapons and flew farther than attack planes, they delivered a bigger punch at longer distances when flying conventional interdiction missions or strategic raids against targets within an enemy nation. Thus, they usually had at least two crew members and two or more engines. For protection, bomber designers wanted speed, but only if it did not sacrifice the other needs. Because they were usually slower than fighters, most bombers through World War II carried many defensive guns. The greater aircraft speeds and long-range, air-to-air missiles seen afterward dictated that bombers carry fewer guns, if any at all. Later designs relied upon speed, electronic countermeasures, or "stealth" antiradar design for protection.

Early Uses of Military Aircraft

Although World War I produced basic air combat designs, the airplane's earliest and most obvious military missions were observation and reconnaissance. World War I observation planes carried weapons and usually did not differ from attack or fighter types, though the Germans specially designed their Rumpler planes to fly at high attitudes. World War II air arms modified fighters and fast bombers such as England's Mosquito to carry camera gear and use performance to evade defenders. This practice continued afterward, but the Cold War's explosive improvements in jet fighter and SAM performance forced the creation of special models. The U.S. U-2 and SR-71 were capable of either or both great speed and ultra-high altitude.

Post-World War I military needs and technological innovations created more airplane types to meet force enhancement and support requirements. Although primitive resupply operations occurred in World War I, postwar transport plane advances opened military air supply opportunities. Cargo planes obviously required long-range and load carriage ability to support aerial logistic and army paratroop operations. The subvariants split between those with exceptional capacity and range, such as the U.S. C-5, and smaller, rugged types able to operate from short, unimproved airfields, such as the U.S. C-130. The U.S. Air Force led other air arms in modifying large planes, usually transports, to accomplish various electronic support missions. These included airborne early warning—radar at high altitude allowed greater surveillance coverage—and electronic intelligence-gathering. Later models tracked ground vehicular traffic. Also, the leading national air arms modified transports and other types to fly airborne tanker missions. These tankers had a decisive effect upon airplane endurance and striking distance. Fi-

nally, the Vietnam War (1961-1975) and later conflicts witnessed the use of remotely piloted planes, or "drones," for surveillance and decoy purposes.

HELICOPTERS

After their first appearance in World War II, helicopters made great strides. Initially, piston engines' limited thrust restricted helicopter missions to small-scale logistics. Jet-powered helicopters appearing from the 1950's onward enjoyed expanded opportunities. Big cargo helicopters conducted large-scale airmobile troop transfers, and smaller, faster, and more agile attack helicopters flew traditional scouting missions as well as immediate firepower support for either airmobile or antiarmor activities. Attack helicopters' navigation and fire control avionics nearly matched those of jet planes.

AIRCRAFT WEAPONS

From almost their first appearance in battle, aircraft have used these basic weapons types: guns, missiles, and bombs. Although each weapon's fortunes fluctuated throughout the twentieth century, by the century's end, all three remained in active use, meeting specific combat demands served by each weapon's individual strengths.

Hulton Archive/Getty Images

World War I "ace" Eddie Rickenbacker, standing beside one of the fighter planes he piloted. Fighter action was the best-known action of World War I air combat.

The machine gun has been an aircraft weapon since World War I, though early airplane designs limited its impact. Most fighters were too small to carry many guns or much ammunition. The thin wings of these aircraft meant that one or two fuselage-mounted, forward-firing guns shot either above the propeller or through it via a synchronization mechanism. Other planes fired guns toward the rear against attackers or, in early rear-engine planes, from the very front. World War II fighters' more substantial wings mounted up to eight machine guns or fewer guns of high 20-millimeter caliber. A few planes carried small cannon for use against hardened targets.

In the 1950's some U.S. fighters lacked guns, because air leaders believed that high aircraft speeds and guided missiles rendered these weapons useless. However, guns reestablished their worth during close-in dogfight combats of various 1960's wars, and later U.S. fighters carried guns. Gun caliber, muzzle velocity, and rate of fire also dramatically improved during this time, reaching its zenith when the Americans introduced the Gatling rotary cannon technology featuring phenome-

nal firing rates—thousands of rounds per minute. The U.S. A-10 was built around a car-sized, 30-millimeter Gatling gun designed for antiarmor attack missions. The U.S. Air Force's transports-turned-gunships carried small artillery. Helicopters carried guns for both antipersonnel and antiarmor operations.

During World War I, airplanes used rockets to attack observation balloons. World War II featured more widespread rocket use. The Americans and especially the British used rockets against both ships and tanks. German fighters fired rockets against Allied bomber formations. As the war ended, the Germans used radio-controlled missiles against ships and bridges. They were also developing a wire-guided air-to-air missile.

GUIDED MISSILE SYSTEMS

After World War II, air-launched missile performance greatly improved. Guided missiles affected air-to-air combat tactics, especially regarding firing positions against a target. Heat-seeking missiles such as the U.S. Sidewinder tracked strong heat contrast and allowed greater firing distance and less precise aiming than did guns. Early heat-seeking missiles tracked aircraft exhaust, requiring that a fighter pilot maneuver toward an opponent's tail to shoot. Later versions even sensed an airplane's engine section, which allowed all-aspect shots. Radar missiles could also shoot a target from any direction and even from beyond visual range (BVR). However, both early and later radar-guided missiles required the pilot to fly forward, illuminating the target with radar so the missile could hit it. Late-twentieth century radar missiles did not even require this action, but their target identification and launch procedures remained more cumbersome than those of heat-seeking missiles. Thus, in spite of their intimidating air-control potential, BVR shots were often prohibited during combat to prevent accidentally shooting one's own planes. Even so, radar missiles became so effective that the United States developed the F-22 stealth fighter in the 1990's to counter them.

Air-to-ground missile capability also increased in the 1990's. Attack planes and helicopters continued to use rockets either as weapons or as target markers for other aircraft. As for guided air-to-ground missiles, initial designs such as the U.S. Bullpup required that the pilot continually guide the missile toward the target. Indeed, the laser-guided, antitank missiles used by helicopters through the twentieth century's end also required continual laser illumination. However, more lethal air defenses made self-guided missiles ever more attractive. In the 1970's, the United States introduced Maverick tactical missiles that tracked video or infrared image contrast. Additionally, considering radar-guided SAMs and AAA, the United States and other nations built missiles that were guided by radar transmissions.

However, the best air-to-ground guided missiles were long-range, or cruise, missiles. The primary worth of these jet- or rocket-powered weapons was standoff capability: hitting targets while avoiding air defenses. As early as the 1960's, both U.S. and Soviet bombers carried cruise missiles for standoff strategic attacks. In the 1980's efficient engines, along with vastly improved navigation and targeting gear, gave these weapons remarkable speed, range, and accuracy. Navies equipped attack planes with antiship cruise missiles, and these achieved spectacular success in the 1982 Falkland Islands War. In the 1990's, U.S. bombers used cruise missiles in various wars and punitive air strikes. These achieved the desired politico-military impact with little threat to the attackers.

BOMBS

However, bombs were the most common method for achieving the airpower payoff. Although the earliest bombs were grenades and modified shells, from World War I through the twentieth century's end their outward appearance remained essentially the same: that of a cigar-shaped metal cylinder with tail fins. They achieved explosive destruction of ground targets, and even by World War I's end, aircraft carried bombs of more than 1,000 pounds in weight. Additionally, the war introduced bomb variants designed for specific destructive effects. Some achieved basic blast impact, others inflicted fragmentation damage upon people and thinly protected facilities, and still others featured incendiary effects. In World War II, bomb size increased to over 20,000 pounds,

and different variations continued. Hardened bombs pierced armor, air-dropped mines blocked shipping lanes, and still others intensified incendiary damage by carrying jellied gasoline (napalm) or phosphorus. Most significant not only for airpower but also for warfare overall were atomic bombs, which achieved cataclysmic destructive effects.

The Cold War witnessed the rise of other bomb types, such as the conventional cluster bomb and the nuclear hydrogen bomb. Cluster bombs used a bomb-shaped shell that opened while airborne and released many smaller bombs designed for either antipersonnel or antiarmor effects. Hydrogen bombs' nuclear fusion achieved unlimited blast and radioactive impact.

The most significant development in bomb technology came with the widespread use, at least by the United States, of precision-guided bombs. These weapons first appeared in World War II, but conventional war demands, particularly in Vietnam, accelerated development of bombs with laser or television seekers, along with controllable fins for steerage. Most required that a crew member guide them to the target. Their most significant impact was a virtual revolution in precision, in which fewer planes were needed to destroy a given target.

DEVELOPMENT

War and technological progress created fluctuations in the fortunes of general aircraft types. In World War I, airships and airplanes both executed war missions, but by World War II, the airship's combat use had faded, as the airplane became the preeminent combat air machine. By the 1960's the helicopter had joined the airplane as part of the modern air arsenal.

At the beginning of the twentieth century military balloons already existed, having been used in previous wars for observation. At this time dirigibles offered the best hope for more aggressive combat airpower projection, because they possessed the controlled mobility that balloons lacked. Indeed, some military observers feared airship attacks in future wars. However, despite the better range and load capacity of airships compared to those of the earliest airplanes, airships' weaknesses limited enthusiasm for their combat use even among the Germans, who were their strongest proponents.

On October 11, 1911, during the Italo-Turkish War, an Italian pilot flew the first combat mission, using his plane for reconnaissance. Afterward, Italy used airplanes and dirigibles for bombing attacks. The Turks protested but, foreshadowing future aerial arms races, then procured their own aircraft.

World War I effected a swap in the dirigible and airplane's combat fortunes. Early in the war, a few nations used airships for scouting and army attack missions. The latter soon ended due to losses to the armies' guns. In 1915, as other nations ceased airship attacks, German zeppelins flew night raids on England to disrupt morale and military industry. These raids disturbed the British, but they neither induced a morale collapse nor destroyed industrial or military targets. Airships were too inaccurate, too susceptible to adverse winds, and, as England's defenses improved, too vulnerable. Although zeppelin raids continued through 1918, they became ever more sporadic after 1916 as losses mounted.

THE INCREASING ROLE OF AIRPLANES

The airplane replaced the airship in various roles. In early battles at the Marne (1914) and Tannenberg (1914), observation planes' information helped the winning armies make decisive moves. Indeed, the airplane's most visible impact in the war came via spotting activities that made western front army surprise attacks and breakthroughs extremely difficult. Wireless radios were too primitive and insecure to allow easy air-to-ground communication, but spotter crews eventually combined rudimentary radio use with other signaling means to direct artillery fire and report enemy dispositions.

Airplanes offered more flexibility and striking power in naval operations, despite the initial promise of airships as observer craft. British naval planes conducted one of the first offensive counterattacks when they bombed German zeppelin hangars in late 1914. Their sustained attacks cost the Germans more zeppelins and sparked a small-scale air superiority struggle between British and German seaplanes. By 1915 airplanes had helped direct naval gunfire against

ships and shore targets. Although planes' small bomb loads and inaccuracy usually prevented their sinking capital ships, a British plane sank a Turkish transport with a torpedo in August, 1915. Later, German bombers also sank ships with torpedoes. By 1918 Allied long-range seaplanes patrolled so well that German submarines used sky-search periscopes.

However, ships' mobility made air-to-ship communications unreliable. Further, seaplanes required that ships stop for launch and recovery. These problems surfaced in the 1916 Battle of Jutland, when scout aircraft for both sides delivered only belated reports. In 1917 the British converted a cruiser, the HMS *Furious*, into an aircraft carrier that launched and recovered airplanes while under way. Carrier-based fighters better enabled the Royal Navy to defeat German seaplanes and zeppelins.

Airplanes also surpassed zeppelins in attack and strategic bombing, though bomb load limitations and poor accuracy also hindered their effect. By 1915 all western front air arms had attempted interdiction missions. The aggressive flying policy England's Royal Flying Corps commander General Hugh Trenchard (1873-1956) included striking airfields and supply lines. However, its impact was reduced by dispersed attacks, limited destructive capacity, inaccuracy, and German repair efforts. Trenchard's close air support missions involving trench attacks achieved some morale effect, but these uncoordinated raids by fighters and attack planes suffered high losses and forever soured the British on the mission. The British achieved better army air support results in the Middle East against the Turks than on the western front, thanks to arid terrain and dispersed ground forces. These conditions better allowed British planes to disrupt enemy ground efforts, and in September, 1918, they trapped and destroyed two Turkish divisions in a narrow pass. In the Germans' 1918 western front offensive, dedicated air support units in purpose-built Halberstadt attack planes flew concentrated strikes against Allied troops at or near the front. They enjoyed better success than that seen in previous British efforts, though British planes materially assisted their army's counterattack via interdiction and attacks upon antitank defenses.

Early in the war, the Russians and Italians produced large bombers for long-range attacks, but they lacked the resources to sustain deep bombing operations. In 1917 the Germans fielded huge multiengine planes that continued the attack that zeppelins had started against England. Like airships, they were inaccurate and failed to cause significant damage. Although British defenses soon forced them to attack

TURNING POINTS

Oct. 11, 1911	After an Italian pilot flies the first combat mission, using his plane for reconnaissance, during the Italo-Turkish War, Italy begins using airplanes and dirigibles for bombing attacks.
May 10, 1940	The German Luftwaffe conducts the first combat parachute and glider troop landings to open Germany's western front attack.
Nov. 10, 1940	The British Royal Navy produces a decisive aerial victory at Taranto Harbor, Italy, crippling the anchored Italian fleet with nighttime bomb and torpedo attacks.
Dec. 7, 1941	The Japanese navy launches a morning surprise air raid against the U.S. fleet at Pearl Harbor, Hawaii, sinking or damaging several U.S. battleships and affirming airpower's military importance.
Aug. 6, 1945	In the first nuclear air strike, an American B-29 bomber drops an atomic bomb on Hiroshima, Japan, hastening Japan's surrender and the end of World War II.
June 5, 1967	The Israeli Air Force (IAF) launches devastating surprise counter-air raids against threatening Arab nations.
Oct. 6, 1973	The IAF suffers heavy losses against densely packed Arab missiles in the first day of the Arab-Israeli October War.
Jan. 17, 1991	A U.S.-led U.N. coalition leads a well-orchestrated air attack against Iraqi dictator Saddam Hussein in an effort to oust his forces from Kuwait.

only at night, German planes still mounted a bombing campaign that caused public outcry and forced the British to divert fighters from the front.

THE EVOLUTION OF THE FIGHTER PLANE

The fighter plane was created to stop the enemy from flying these emerging missions, as well as to protect friendly missions from enemy fighters. Fighter designs evolved especially quickly, in part because of their fiercely competitive purpose. Initially, rear-engine "pusher" planes with forward-mounted guns represented the fighter ideal. However, the appearance of Germany's Fokker E-III's in the summer of 1915 heralded the first major fighter technology advance. The E-III synchronized machine-gun fire through its front-mounted propeller and, flown by a great aerial tactician such as the German ace Oswald Boelcke (1891-1916), it became an aerial scourge. Escalations in technology encouraged disciplined formation flying for protection. Improved Allied fighters such as France's Nieuport countered the E-III, until Germany introduced the Albatross series in 1917. This development and massed German fighter sweeps inflicted high air losses. The Allies permanently regained the technological and numerical edge later that year with such planes as England's Sopwith Camel and France's SPAD.

Fighter action was the best-known aspect of World War I air combat. The top pilots received national adulation, and those who downed at least five planes (actually, the number varied by country) were dubbed "aces." Fighters helped end the zeppelin threat and forced attack and bomber planes to fly at night or in formations escorted by their own fighters. Boelcke's air fighting principles remained valid through the century's end.

The war established more than fighter aces. Naval air war, attack, and strategic bombing concepts emerged. Germany's bombing of England stirred a public uproar and spurred the creation of the Royal Air Force (RAF) in 1918. Although airplanes were relatively primitive, good production required dedicated organization and advanced industrial capacity. Russia and Italy's internal problems stifled bombing's promise. The United States lacked the time to produce competitive designs. Industrial strength and desperate wartime struggle made the western front combatants air warfare leaders. The Allies partially owed their final air superiority to their two-to-one airplane production lead over the Germans. Finally, air fighting required skill, and at times the British and Germans experienced training difficulties that incurred even higher losses.

EARLY AIRPOWER ADVOCATES

World War I inspired postwar airpower advocacy in certain countries. Its bloody ground stalemate appalled Italian air officer Giulio Douhet (1869-1930), who believed that airplanes could surmount traditional obstacles and break this condition. Douhet asserted that bombers could use poison gas bombs, if necessary, to strike an enemy nation and induce an internal collapse similar to Germany's downfall in 1918. Although Douhet overestimated the bomber's destructive power and underestimated air defenses and national will, he affected thinking in other areas through his writings.

Royal Air Force commander Hugh Trenchard did not publish his ideas as Douhet did, but his policies reflected similar thinking. Trenchard wanted bombers that could strike any nation that attacked Britain, and he also aimed to justify his newly independent service's existence. Ironically, it already had done so as it executed the government's postwar desire to police its colonies by air.

U.S. Army Air Service general William "Billy" Mitchell (1879-1936) reacted not only to trench slaughter but also to drastic postwar budget cuts. His unsuccessful but outspoken advocacy of a separate air force including naval and land-based air units stemmed from his opinion that only experienced aviators understood airpower. Influenced somewhat by Douhet, he also believed that bombers could induce a national collapse.

All these men experienced varying degrees of controversy expressing themselves, because even the victorious nations' military budgets stifled rapid air development. Many advances came from civilian sources. Germany developed a metal attack monoplane at war's end, but airline companies and other civilian organizations produced innovations that increased speed and bad weather capability: retractable

landing gear, pressurized cockpits, voice radio, and instrument navigation. In 1931 the Boeing B-9 introduced variable-pitch propellers, which helped acceleration and climb. In 1932 the Martin B-10 featured enclosed cockpits and improved bomb capacity. The 1920's Schneider and Thompson Trophy air race winners were streamlined monoplanes that influenced later fighter designs, such as England's Spitfire.

The military contributed to aviation developments where possible, especially after the leading nations rearmed in the late 1930's. Military pilots set distance and altitude records using boosted engines, another innovation. Americans improved high-altitude bombing accuracy with the Norden sight. The Soviet Union introduced paratroop operations.

Army Times Publishing Co.

A P-47 fighter plane, which during World War II also excelled as an attack plane, making bombing runs.

Despite relatively slow advancement, aircraft improvements between the two world wars were significant. World War I's fabric biplane fighters with 250-horsepower engines flying at 100 knots changed to metal monoplanes with 1,000-horsepower engines and 300-knot speeds. New monoplane bombers were smaller but faster and carried more bombs. Modified airliners such as the U.S. C-47 transformed logistical considerations.

AIRPOWER IN WORLD WAR II

At the beginning of World War II, the most advanced and determined nations again had the best air arms, though technological complexity and organizational demands vexed some of them. The now independent German Air Force (Luftwaffe) appeared to be the strongest, with standout planes such as the Messerschmitt-109 fighter and the Junkers-87 dive-bomber. However, bombsight and aircraft developmental problems combined with leadership changes to stifle the production of heavy bombers, producing a more tactical orientation. Bombers such as the Heinkel-111 seemed adequate for strategic bombing against European targets, but Luftwaffe leaders ruined other bomber designs by demanding dive-bomb capability for even big planes. The Luftwaffe's Spanish Civil War (1936-1939) experience apparently supported its air policy choices.

Motivated by American bomber technology advances, the U.S. Army Air Corps—later renamed the Army Air Force, anticipating its future independent status—emphasized strategic bombing. The British upgraded their fighter defenses in response to heavy bomber development problems, the rising German air threat, and their own radar advances. Rapid industrialization formed the foundation for a large Soviet air force, which produced some promising designs, but the 1930's purges of Joseph Stalin (1879-1953) hindered development. France and Italy lagged behind because of incoherent national defense policy and lack of resources.

Aircraft carriers demanded even more resources and intent, and only three powers used them: the United States, Japan, and England. Under Admiral William Moffett's (1869-1933) leadership, American naval air resisted Billy Mitchell's threats to its own status and, exploiting arms treaty conditions, built new aircraft carriers. Admiral Joseph Mason Reeves (1872-1948) led tactical innovations that gave the carrier force an aggressive fighting style. Ja-

pan developed a similar carrier doctrine, and both navies fielded planes that delivered a knockout blow or defeated air threats, such as the U.S. Dauntless dive-bomber and Japan's Zero fighter. England's navy anticipated facing many European land-based planes and built smaller, more rugged carriers. Small carrier size and the RAF's control and neglect of naval aircraft development meant that British carriers lacked the aerial punch of other navies' carriers.

World War II began with Germany's 1939 Poland invasion and 1940 Western Europe offensives. The Luftwaffe was an important part of what became known as Blitzkrieg warfare. It simultaneously stifled enemy air defense and attacked any direct or resupply effort impeding rapid tank advances. On May 10, 1940, it conducted the first combat parachute and glider troop landings to open Germany's western front attack.

The Luftwaffe embarked upon more independent action in the summer, 1940, Battle of Britain, the first air-dominated major battle in history. The Germans' pre-invasion daylight air campaign failed for many reasons. Their leaders established an unrealistic campaign timetable, their attacks did not destroy the radar sites that gave British fighters a decisive edge, and they ceased attacking airfields just when these missions began hurting the RAF. Downed German fliers fighting over the RAF's homeland could not fly again as could their British opponents. Meanwhile, British industry recouped fighter losses. On September 15, 1940, the Germans suffered a mauling that convinced them of their campaign's failure.

Germany's bombers also had insufficient defensive armament, and its fighters lacked sufficient range to escort them. However, these deficiencies also existed in other air forces. The British had earlier encountered similar problems when they lost many bombers during unescorted daylight raids. After the Battle of Britain, both sides reverted to nighttime bombing and daylight fighter sweeps. Bombing accuracy was atrocious, and both sides justified the raids as a way to destroy industrial workers' morale, if not the workers themselves.

The European air war assumed an electronic character. German bombers used intersecting radio beams as an approximate bomb-release point, and the British tried to jam the beams. Both sides' search radars guided radar-equipped night fighters against enemy bombers. Later, bombers dropped foil strips to muddle radar returns.

Given the western front aerial deadlock, the Royal Navy produced a decisive aerial victory at Taranto Harbor, Italy, on November 10, 1940. Carrier-based Swordfish biplanes crippled the anchored Italian fleet through nighttime bomb and torpedo attacks. Apart from eliminating a Mediterranean naval threat, the Taranto raid impressed Japanese naval leaders, whose carriers launched a morning surprise air raid against the U.S. fleet at Pearl Harbor, Hawaii, on December 7, 1941. The Japanese sank or damaged several U.S. battleships, indelibly affirming airpower's military importance.

The U.S. entry into World War II introduced a combatant with unlimited resources, organizational prowess, and aroused willpower. The Soviets, already at war, also mass-produced warplanes, but they concentrated upon designs, such as the Shturmovik attack plane, that provided army air support. The United States, however, produced abundant outstanding planes for all missions.

U.S. airpower first established itself in two decisive Pacific theater naval victories. The spring, 1942, Battles of Coral Sea and Midway featured no surface engagements, as carrier planes decided the outcome. Both sides launched massed raids to sink the enemy's carriers and eliminate the primary naval threat. Vast distances and ships' mobility still made reconnaissance and communications difficult. Thus, carrier battle victory could be terrifyingly random.

Pacific air fighting up through the Solomon Islands campaign (1942-1944) ensured further U.S. success through attrition of Japanese warships and, most important, experienced Japanese pilots. Japan's pilot training setup failed to produce the abundant replacements that the Americans enjoyed. In the Atlantic, the U.S. Navy increasingly used aircraft carriers and long-range patrol planes to avert the German U-boat threat.

North African fighting against the Germans in 1943 helped U.S. Army Air Force leaders establish doctrinal and command setups that endured through the century's end. A single air leader controlling all

of a war theater's air assets would ensure unity of air command and a coherent air campaign, which followed the tactical mission priority of air superiority, interdiction, and then close air support.

From 1942 onward, the Army Air Force pursued a bigger goal with its daylight strategic bombing campaign against Germany. Its leaders believed that their B-17 and B-24 bombers possessed ample defensive armament and bombing accuracy to withstand defenses and win the war by inducing Germany's internal collapse. In the meantime, England would continue night attacks with its new heavy bombers.

The Americans dismissed earlier British and German day bombing failures as irrelevant, but by autumn, 1943, their campaign staggered under heavy losses and targeting decisions that sometimes negated intended effects. The installation of drop tanks on the superb U.S. P-47 and P-51 fighters saved the campaign. This adjustment allowed long-range escort, which reduced losses and decimated German fighter forces. The latter effect helped guarantee air superiority for the 1944 Normandy landings. It also enabled paratroop assaults and ample air support for the Allied armies' sweep across Europe.

The Pacific war's concluding years witnessed complete U.S. air superiority, backed by such outstanding naval fighters as the Hellcat and the Corsair. The Japanese carrier threat disappeared, and amphibious assaults enjoyed lavish air support. The Japanese introduced one late-war air menace when they launched a morbid form of guided weapon, land-based kamikaze suicide missions, against American ships. On August 6, 1945, in the first nuclear air strike, an American B-29 bomber dropped an atomic bomb on Hiroshima, Japan. Another bomb hit Nagasaki three days later. These raids hastened Japan's surrender.

The atomic bombs' effect upon Japan's surrender did not completely vindicate visionaries such as Billy Mitchell. Although the bombs ended the war's fighting sooner, they also struck a nation reeling from other military disasters. Debate over their necessity and impact continued through the century's end and involved issues beyond airpower's capabilities.

The European strategic bombing campaign failed to win the war single-handedly, as its proponents had hoped. However, more concentrated attacks in the war's final year demolished Germany's oil production and transportation facilities. Bombing crippled Germany's war effort through overall damage, reduced worker output, and massive defense and industry diversions. It also facilitated the accomplishment of other air missions.

LESSONS OF WORLD WAR II

Western European air warfare involved the most advanced air combatants, but its conduct and lessons were not universally applicable. In some theaters, strategic bombing was not relevant and air arms did not follow tactical priorities that the U.S. Army Air Force confirmed while fighting the Germans. The Russian front was so vast, and Soviet resources were so abundant, that a strategic bombing campaign was neither possible nor desirable for either side. This situation existed in the Pacific war's early years, when

Hulton Archive/Getty Images

A "Fat Man" atomic bomb. The first such bombs, "Fat Man" and "Little Boy," were dropped from B-29 bombers on the Japanese cities of Hiroshima and Nagasaki, effectively ending World War II.

Japan was too distant for sustained bombing. In both theaters, tactical campaigns featuring tank battles, carrier battles, or amphibious landings were themselves decisive, and required that attack planes execute their missions even as fighters struggled for air superiority. In some amphibious landings, no air threat and no rear area existed to justify fighters or an interdiction campaign, but air support missions were very important.

Other results echoed World War I's lessons. As it evolved, airpower demanded tremendous resources, and the American war effort understandably overwhelmed its opponents. Under great pressure, given their many well-armed opponents, the Germans and Japanese made critical airplane procurement and pilot training errors that helped them to lose the air war. Indeed, insufficient resources and incoherent application hampered Germany's introduction of Messerschmitt-262 jet fighters at war's end. The Soviet air force suffered frightful losses but possessed ample resources and people with which to overcome them.

Army Times Publishing Co.

Two F-4 Phantom IIs, often employed as multipurpose fighter-bombers, in flight over a coastline.

Above all, airpower demonstrated its decisive impact upon modern war. Strategic bombing accelerated national defeat. Airplanes were integral to the Blitzkrieg-style armored offensives that many armies came to favor. For example, Army Air Force planes literally provided flank security as U.S. armies raced across France. The aircraft carrier replaced the battleship as the most important naval unit. Transports enabled paratroop assaults and long-range supply.

POST-WORLD WAR II AIRPOWER

The atomic bomb and jet technology seemed to guarantee airpower's combat primacy in the postwar years, but troubling times lay ahead. Nuclear-armed bombers gave any nation possessing them a compelling military trump card, and superpower nuclear parity helped prevent a third world war through deterrence. Indeed, throughout the 1950's, the newly independent U.S. Air Force's Strategic Air Command, with its B-52 bombers and KC-135 tankers, received most of the U.S. defense budget. However, nuclear weapons were otherwise militarily ineffective, because their actual use was unthinkable.

Further, airpower's expense skyrocketed with aviation technology progress, as only the superpowers could afford a full air arsenal and associated training and support costs. Jet-powered bombers were extremely expensive, and by century's end, one American B-2 stealth bomber cost nearly one billion dollars. Air combat's evolution bred even more diverse types, which incurred great expense in electronic gear if not aircraft design: drones, early warning planes, special reconnaissance planes, and tankers. Cold War rivalry sustained a swift evolution cycle of aircraft design, as six fighter generations created more expense via increasingly exotic engines, airframes, and weapons. The

late 1940's saw straight-wing jets. The early 1950's saw transonic swept-wing planes such as the U.S. F-86 and Soviet MiG-15 used in the Korean War (1950-1953); the mid-1950's, afterburner-engine supersonic planes such as the U.S. F-100; and the late-1950's, Mach-2 radar-equipped fighters, such as the U.S. F-4, the Soviet MiG-21, and France's Mirage series, all of which fought in many wars. In the 1970's superfighters such as the U.S. F-14 and F-15 combined speed, maneuverability, and sophisticated fire control. By century's end stealth fighters had been developed.

Expense incurred great procurement risk and occasional embarrassing failures, as England's TSR2 attack plane and U.S. F-111 multipurpose fighter programs revealed. Unexpected threat advances and high program costs sometimes sparked controversy, as when U.S. leaders canceled the B-70 and debated procuring the B-1. The widening airpower performance and task spectrum forced hard choices about aircraft design strengths. Fighter-bombers such as the U.S. F-105 lacked maneuverability for dogfighting as well as endurance and bomb carriage for close air support. Their cost and training demands also discouraged their use in diverse missions. Thus, air arms had to tailor designs for certain fighting styles and situations. The Soviet Union mass-produced relatively simple fighters capable of quick attacks and escapes. The United States fielded many attack planes, such as the A-4 and the A-10, for tactical support. The British and U.S. Marines chose the AV-8 Harrier attack plane because its vertical takeoff-and-land performance promised deployment flexibility.

Above all, post-World War II combat revealed that a remarkably wide spectrum of conventional war situations remained possible, driving combat plane design variations. In the Korean War U.S. jet fighters outfought Soviet MiGs to maintain air superiority. Attack planes thus became critical factors in stopping two communist offensives and maintaining the lines until the 1953 cease-fire. The U.S. A-1 and other propeller-driven attack planes remained useful, given that they were more maneuverable, carried more weapons, or flew longer than the available jets. U.S. air arms ignored Korea's results and emphasized nuclear warfare training through the 1950's.

U.S. Airpower in the Vietnam War

However, similar conditions arose in the U.S. war in Vietnam. U.S. airpower was omnipresent, providing on-call fire support, transportation, and surveillance. Indeed, it significantly supported the defeat of the Communists' 1968 Tet Offensive and was primarily responsible for thwarting North Vietnam's 1972 offensive.

However, Vietnam warfare exposed problems in U.S. air strategy. U.S. planes could not completely disrupt North Vietnam's war effort due to jungle concealment, political restrictions, and the Communists' determination despite severe air-inflicted losses. Oriented toward bomber interception and nuclear strikes, U.S. fighters and attack planes and their crews performed less well than expected against North Vietnam's Soviet-supplied fighters and SAMs. Indeed, these defenses forced the Americans to use special radar jamming and attack planes.

Vietnam's ground war and relatively light air defenses brought forth special attack planes, some of which defied air progress notions. The AC-130 transport-turned-gunship and maneuverable, Korean War-vintage A-1 were two examples. Their weapons capacity and endurance made them excellent close air support machines.

Helicopters confirmed their worth during the ground war in Vietnam. They had first been used by the United States in 1944 for light logistics duties in Burma, and they performed similarly in subsequent small wars. Before Vietnam, U.S. Army generals and other officers developed helicopter organizational setups that, combined with the capabilities of jet-powered helicopters such as UH-1 transports and AH-1 gunships, gave unprecedented mobility and immediate firepower to Army troops in South Vietnam. Despite their utility, however, helicopters remained vulnerable to ground fire, as the Soviet Union's helicopter misfortunes in its Soviet-Afghan War (1979-1989) also revealed.

Across the world, airpower proved more decisive when the Israeli Air Force's (IAF) June 5, 1967, surprise counter-air raids crippled the Arab nations threatening Israel. After destroying their opponents' air forces, Israeli jets spent the rest of the Six-Day War pummelling Arab army units, who could not

hide in the desert. Despite its outstanding reputation, even the IAF suffered heavy losses against densely packed Arab SAMs and AAA in the Israeli-Arab October War's first day, October 6, 1973.

The Israelis recovered and did well in that and later conflicts, but airpower difficulties in the Vietnam and October Wars sparked technological and tactical innovation. Stealth technology and standoff precision weapons promised better fortunes against SAMs. Western air arms conducted more realistic training, such as the U.S. Air Force's Red Flag exercises.

AIRPOWER IN THE 1990'S

Refinements allowed U.S. airpower to rebound in wars of the 1990's. The Cold War's end removed Soviet sponsorship from other American enemies. These nations' leaders lacked military expertise and valued their internal power more than military victory.

Throughout late 1990, Iraqi dictator Saddam Hussein let a U.S.-led U.N. coalition mass against him in their effort to oust his forces from Kuwait. On January 17, 1991, these forces opened the Gulf War (1990-1991) with a well-orchestrated air attack that quickly immobilized the Iraqis. Surveillance planes reported all Iraqi ground and air movements. Fighter and defense suppression missions, including surveillance and decoy drones, stifled air defenses. Attack planes battered army positions. Stealth planes attacked deep interdiction targets, such as command and communications centers, with no losses. Precision-guided weapons destroyed targets with minimum risk and attack-force size. After several weeks of aerial bombardment, U.N. ground forces liberated Kuwait with limited Iraqi opposition.

In spring, 1999, U.S.-led NATO air forces compelled Serbian dictator Slobodan Milošević to remove troops from Kosovo province. Overwhelming U.S. air strength, including B-2's, cowed Serb air defenses and delivered accurate deep strikes with precision weapons. Losses were minimal.

Although air-only threats and actions had been made in the past, the Kosovo war was the first conflict in which airpower alone forced a nation to withdraw its troops from a contested area. Milošević's internal concerns and a threatened ground invasion apparently also influenced his decision. Kosovo proved that in warfare's wide situational spectrum, cases exist where airpower alone can win wars.

Each war determines the types of weapons that will best serve one's ends, and most late-twentieth century combat conditions did not favor strategic airpower as much as Kosovo's did. U.S. political limitations in the 1993 Somalia skirmishes inhibited airpower's full play. Different situations allowed more tactical airpower units, such as aircraft carriers, significant influence. In conflicts where conditions prevented nearby basing, such as the Falkland Islands War, the 1983 invasion of Grenada, the 1988 U.S.-Iran naval fights, and 1999 Desert Fox punitive raids against Iraq, carrier-based airplanes provided most if not all of the airpower's punch.

AP/Wide World Photos

An F-22 Raptor, developed in the 1990's and called the most sophisticated fighter plane ever, flies over California.

U.S. Air Force

A B-2 Spirit bomber over the Pacific in 2006.

Increasing air weapon expense meant that nearly all nations could not address all of the air warfare scenarios seen after World War II, or even the ones they would most likely encounter. The combatants in the Israel-Arab Wars, the Iran-Iraq War (1980-1988), and the Indo-Pakistani Wars were all limited by their lack of airpower resources. By century's end, economic constraints forced even the United States to review how much of the widening airpower spectrum—stealth fighters, close air support planes, attack helicopters, advanced drones, surveillance planes—it could afford.

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Douglas Campbell

Rockets, Missiles, and Nuclear Weapons

Dates: Since c. 1200

Nature and Use of Rockets and Missiles

Although the terms "rocket" and "missile" are sometimes used interchangeably, when speaking of weapons the term "rocket" generally refers either to the means of propulsion or to a relatively small rocket projectile, and the term "missile" usually refers to a more complex weapon. A ballistic missile follows a ballistic trajectory—the path a thrown rock would take—for most of its flight and is guided only during or shortly after launch.

At its most basic, a rocket motor is simply a chamber with a nozzle at the rear. Fuel is burned in the chamber to produce hot, pressurized gases that then are exhausted through the nozzle. In accordance with Isaac Newton's third law of motion, which states that for every action there is an equal and opposite reaction, the rocket is pushed forward by expelling these exhaust gases backward out of the nozzle. The rocket is not pushed forward by the exhaust gases pushing against the air behind the rocket, as is sometimes supposed. In fact, because a rocket carries its fuel along with an oxidizer to burn it, a rocket does not need air and can operate in the vacuum of space.

Although it is not known exactly when the first rocket was invented, its origins likely lie with the fire-arrow, a tube filled with burning powder attached to an arrow. Gases escaping from the tube helped propel the arrow, and sparks from the burning powder conveniently started fires. Thirteenth century Mongol leader Genghis Khan (r. 1206-1227) used fire-arrows in battle, and in 1429, French troops under Joan of Arc (c. 1412-1431) used rockets in the defense of Orléans. Improvements led eventually to the war rockets of Tipu, Sultan of Mysore in the south of India (r. 1782-1799), who used them in 1792 to terrorize British soldiers.

Colonel William Congreve (1772-1828) at London's Woolrich Arsenal was assigned to study Tipu's rockets and to develop a rocket for the British artillery that could be made in large numbers. The product of his research, the Congreve rocket, had a range of 2.7 kilometers and consisted of an iron case filled with black powder. The case was attached to a long stabilizing stick, and air drag on the stick kept the rocket pointed forward. A chamber on the front of the rocket held either an incendiary or an explosive that was ignited by a fuse.

Congreve considered rockets to be ideal weapons for ships, because there is no recoil, as there is with cannons. In 1806, during the Napoleonic Wars, the British navy fired two thousand Congreve rockets at the French in Boulogne, setting several buildings ablaze. In 1807 thirty thousand rockets were fired into Copenhagen and set much of that city on fire. Inspired by the barrage of Congreve rockets fired by the British against Fort McHenry during the War of 1812, Francis Scott Key wrote his poem "The Star-Spangled Banner," which became the U.S. national anthem.

Later, William Hale of Britain dispensed with the clumsy guide stick and spin-stabilized the rocket by placing three slanted metal vanes in the rocket's exhaust. The Hale rocket was used by the United States during the Mexican War. However, as artillery evolved in accuracy, rockets were employed less frequently, except for special uses, such as carrying lightweight lines from rescuers to stranded ships.

Rockets and missiles can be divided roughly into three groups, depending upon their ranges. Battlefield weapons are used in a local area, with the combatants often within sight of each other. Theater mis-

Hulton Archive/Getty Images

A U.S. Air Force TM-76 B Mace tactical range ballistic missile in a 1961 test launch at Cape Canaveral.

siles have ranges of 160 to 3,200 kilometers, whereas intercontinental missiles have longer ranges. Both theater weapons (except low-flying cruise missiles) and intercontinental missiles rise through the atmosphere and coast through space before reentering the atmosphere to strike their targets.

DEVELOPMENT OF ROCKETS AND MISSILES

After military interest in rocketry declined, progress depended upon the efforts of a few indefatigable individuals, such as American physics professor Robert H. Goddard (1882-1945), who took a practical engineering approach. Goddard began by experimenting with solid-fuel rockets and developed a portable rocket, the forerunner of the bazooka, for the military. He became the world pioneer in the development of liquid-fuel rockets, but his work was eventually surpassed by that of Wernher von Braun (1912-1977) and his associates, who were working for the German military.

WORLD WAR II

With Germany leading the way, World War II saw the reemergence of the rocket as a useful weapon. The post-World War I Treaty of Versailles (1919)

had limited the number of artillery pieces Germany could possess but had not mentioned rockets. Germany exploited this loophole and began rocket research and development in earnest during the 1930's. Battlefield rockets were used by several nations during World War II, but only Germany used theater weapons: the V-1 and V-2. Germany also had begun design work on an intercontinental missile before the end of the war.

World War II battlefield rockets included barrage rockets, antitank rockets, and rockets fired from aircraft. Although barrage rockets were not extremely accurate, they could be fired by the hundreds to saturate an area. The German Nebelwerfer, or "fog thrower," began as a weapon used to lay down a smoke screen but was adapted to fire barrage rockets. The Nebelwerfer, a towed 6-tube launcher, was nicknamed Moaning Minnie by the Allies because of the eerie sound made by its incoming rockets. Its range was up to 6,000 meters. U.S. barrage rockets could be fired from the Calliope, a 60-tube launcher mounted on the turret of a Sherman tank. When fired in massive numbers, the rockets were ripple-fired, or fired in rapid succession, to minimize one rocket destroying another in the air. The Soviets launched Katyusha rockets from the Stalin Organ, a launcher with 16 to 48 tubes mounted on a gun carriage. The British navy equipped some landing craft with Mattress Projectors, which could fire about 1,000 rockets in 45 seconds. Two such craft could deliver 27,000 kilograms (60,000 pounds) of explosives in less than a minute. The rockets had a range of 3 to 6 kilometers and were used for heavy coastal bombardments prior to landings.

U.S. troops took the Germans by surprise in North Africa with the introduction of the bazooka, a rocket-powered grenade. The rocket, launched from a shoulder-held tube, could disable a moving tank up to 200 meters away and knock out stationary targets up to 700 meters away. The Germans soon answered with antitank rockets of their own: the *Panzerfaust* and the *Panzerschreck*.

Germany worked on several air-launched missiles, but the most successful were the radio-controlled glide bombs Henschel HS 293 and the Fritz-X, also known as the Ruhrstahl SD-1400. When launched, a flare mounted on the missile's tail ignited, and the bombardier watched the flare while using radio-controlled flaps and spoilers to guide the missile to its target. Glide bombs were quite successful when they were first deployed in the summer of 1943. The rocket-powered HS 293 was used against convoy escort ships. The armor-piercing Fritz-X sank or disabled a number of warships, including battleships and cruisers. These missiles would have been even more successful, but they were subject to radio jamming. The controlling aircraft also were vulnerable, and, after the Allies gained air superiority, German bombers could no longer get close enough to their targets to use these missiles.

Russian aircraft successfully used unguided salvos of RS-82, and later, RS-132, rockets against ground troops and armor. British aircraft used their "60-pounder" to decimate German tanks. The 60-pounder was named for the weight of its high-explosive warhead. General-purpose rockets, such as the U.S. 4.5-inch (114-millimeter) HE M8 rocket, were used against vehicle convoys, tanks, trains, fuel and ammunition depots, airfields, and barges. In mid-1944, the M8 was upgraded to the 5-inch (127-millimeter) High Velocity Air Rocket (HVAR), also known as the Holy Moses because of its impressive destructive effect.

The V-1

The Allies had no counterpart to the German theater missiles, the V-1 and V-2. The V-1 was a cruise missile with a maximum range of about 260 kilometers and a top speed of 645 kilometers per hour. Launched from the Pas de Calais area of France, it could reach London in twenty-two minutes. It carried 850 kilograms of high explosives and could have carried nerve gas, but German leader Adolf Hitler was under the mistaken impression that the Allies also had nerve gas and would have used it. Hitler launched the V-1's in retaliation for the Allied bombing of Germany, hence the name *Vergeltungswaffen Einz*, meaning Retaliation Weapon One. This translation quickly evolved to the pithier Vengeance Weapon One, or V-1.

The V-1's motor was a surprisingly simple pulse jet: a long stovepipe with shutter strips across the air

intake at the front end. Air mixed with fuel was exploded by a spark plug. The explosion closed the shutter strips, forcing the exhaust gases out the back end. Incoming air opened the strips, and the process repeated forty-two times a minute, making a characteristic low rumble or buzzing sound that inspired the name "buzz-bomb." The motor only worked at high speeds, so the V-1 was flung into the air at 400 kilometers per hour (250 miles per hour) from a 48-meter-long ramp equipped with a steam catapult.

Beginning in June, 1944, more than 8,000 V-1's were fired at London. Many failed, many were shot down, but about 2,400 arrived. When a timing mechanism indicated that the missile was over its target, the flight control surfaces put the missile into a dive that normally extinguished the engine. Londoners learned to dread hearing the buzzing stop. Over six thousand people were killed and another forty thousand were wounded by V-1's. The bombs destroyed 130,000 British homes and damaged an additional 750,000. The Germans sent 9,000 V-1's against various cities in Europe, including 5,000 against the Belgian port city, Antwerp.

THE V-2

V-2's were about twenty times as expensive to build as V-1's, but both weapons carried enough explosives to destroy a large building. V-1's were developed by the German air force, whereas V-2's were developed by Wernher von Braun and his associates for the German army. Both weapons were manufactured by forced laborers working under deplorable conditions. The V-2 burned liquid oxygen and ethyl alcohol mixed with water, and it weighed about 12,300 kilograms at launch. Although powered flight lasted only seventy seconds, by then the rocket's speed was nearly five times the speed of sound. It had a 320-kilometer range and could reach England in about five minutes. Because it traveled so quickly, there was no defense against it. Furthermore, the V-2's mobile launch facilities were difficult to find and destroy.

More than 1,100 V-2's fell in southern England beginning in September, 1944, killing about 2,700 people and injuring over twice that number. About half of these V-2's hit London. Between December, 1944, and the end of March, 1945, when all V-2 operations ceased, about 2,100 V-2's were fired at Antwerp. Seventeen percent of these exploded on the launch pad, 18 percent failed in the air, but 65 percent reached Antwerp, often striking within several hundred meters of their targets. A total of 7,000 people were killed by V-2's. The V-1 killed about two people per launch, and the V-2 killed about five people per launch. Had either weapon been used in sufficient numbers two or three years earlier, the course of the war might have been different. Although neither weapon ultimately had much effect on the war, the development of the V-2 led directly to the missiles and spaceships that followed it.

DEVELOPMENT OF MODERN BATTLEFIELD MISSILES

Great improvements in missile accuracy required the development of better sensors and of sophisticated electronics based on integrated circuits. Integrated circuits became available in the early 1960's and grew progressively more complex and more reliable.

ANTITANK MISSILES

On the day after the Soviet Sagger antitank missile was introduced in the Vietnam War in 1972, the Americans introduced its counterpart, the TOW missile. TOW is an acronym for tube-launched, optically tracked, and wire-command-link-guided. During the brief 1973 Israeli-Arab October War, TOW and Sagger missiles together destroyed more than 1,500 Israeli, Jordanian, Iraqi, and Syrian tanks.

After a TOW is launched, the gunner must keep the crosshairs of the launch tube sight centered on the target until the missile impacts. As the missile flies at half the speed of sound, a thin wire unreels behind it. A small beacon on the missile's tail sends an infrared signal to a sensor on the launch tube, and a computer in the launch tube sends flight corrections back to the missile through the connecting wire and guides the missile to the target. The TOW can be fired from the ground using a tripod-mounted tube or from launchers mounted on vehicles, including the high-mobility multipurpose wheeled vehicle (HMMWV) and the

Cobra helicopter. There have been five major upgrades to the TOW, which is used by forty-three Allied countries.

Antitank missiles such as the TOW and the Sagger often use a shaped charge that explodes on impact and focuses the explosive energy into a small jet that can penetrate the tank armor. In defense, sandwich armor consisting of an outer steel plate and a thick inner steel plate was developed. Three types of sandwich material have been used: honeycomb ceramic that flows under impact and disrupts the projectile's explosive jet; depleted uranium that retards the projectile's momentum with its massive inertia; and a layer of explosive that detonates and pushes back against the impacting projectile. The latter is called Explosive Reactive Armor (ERA).

The nose of the TOW 2A has an extended probe and a small disrupter charge. The probe and the disrupter charge detonate the reactive armor, and after its protective effect is expended, the main shaped charge explodes and penetrates the main armor. The TOW 2A can penetrate any armor currently in use. The TOW 2B flies over the top of the targeted tank, which is less protected than the sides. When laser and magnetic sensors alert the missile that it is above the tank, two tantalum penetrator projectiles are explosively formed. One is fired directly downward, and the other is fired slightly off to the side to increase the hit probability. The projectile material is designed to start fires within the target. The TOW 2B is expected to be effective against any tank developed in the near future. The TOW FF, a wireless TOW fire-and-forget missile allowing gunners to dive for cover or engage other targets, is under development.

Air Defense Missiles

Just as TOW missiles enable soldiers to stop tanks, surface-to-air missiles (SAMs)—man-portable air defense systems (MANPADS) in their smallest versions—enable troops to counter high-speed, low-level, ground-attack aircraft, or bring down high-flying aircraft. After World War II, German rocket technology was adapted to Cold War needs, though it was not until the late 1950's that it proved to be effective. The Soviet Union was in the forefront of SAM development, adapting German models to the new battlefield climate. One of the most notable achievements of this emerging technology came on May 1, 1960, when the Soviet Union downed a U-2 spy plane, piloted by Gary Powers, with an SA-2 surface-to-air missile. After that time, several generations of SAMs and MANPADS were developed, leading to greater precision and portability. Older technologies are widely available and relatively inexpensive, while more so-

Turning Points

1792	War rockets are used by the sultan of Mysore to terrorize British soldiers.
1805	British artillerist William Congreve develops the first warfare rockets and launching tubes.
1846-1848	Hale rockets, an improvement on Congreve rockets with metal vanes in the rockets' exhaust, are used in the Mexican-American War.
1926	Robert Goddard achieves the first free flight of a liquid-fueled rocket.
1945	The world's first atomic bomb is exploded near Alamogordo, New Mexico.
1952	The world's first hydrogen bomb is exploded at Enewetak Atoll in the Pacific Ocean.
1983	U.S. president Ronald Reagan announces plans to pursue a Strategic Defense Initiative (SDI) designed to provide space-based defense against nuclear missile attacks.
1987	U.S. president Ronald Reagan and Soviet general secretary Mikhail Gorbachev sign the Intermediate-range and shorter-range Nuclear Forces (INF) treaty, the first arms treaty to actually reduce the numbers of nuclear weapons instead of merely limiting their growth.
2002	The United States withdraws from the Anti-Ballistic Missile (ABM) Treaty.
2009	U.S. president Barack Obama is awarded the Nobel Peace Prize, with special reference to his "work for a world without nuclear weapons."

U.S. Department of Defense

A Soviet surface-to-air missile being deployed in Egypt.

phisticated versions are readily available to organizations or individuals with sufficient funding. As a result, MANPADS became a characteristic weapon of the late Cold War and in the practice of terrorism.

One of the most widely used systems, the FIM-92 Stinger, was developed by the United States and provided to Islamic guerrilla fighters, the Mujahideen, in Afghanistan for use in their defense against Soviet invasion during the 1980's. It is estimated that more than 270 Soviet aircraft were shot down with Stingers. When the gunner sights an aircraft, he can send an electronic signal to identify whether it is friend or foe. The Stinger is another fire-and-forget weapon: Once it has been launched, the gunner can dive for cover or engage another target. The Stinger uses both infrared and ultraviolet sensors to home in on the target and can approach it from any aspect. Its speed is supersonic, and its maximum range is 8 kilometers. As global terrorism expanded following the attacks of September 11, 2001, military planners recognized the danger of MANPAD attacks, particularly against civilian aircraft, but no cost-efficient countermeasure could be found.

Missiles in the Gulf War

Several modern missiles were put to the test during the 1991 Gulf War. The start of the air war came during the dark early morning hours of January 17, 1991, when eight Apache helicopters launched laser-guided Hellfire missiles and Hydra-70 rockets against two Iraqi early-warning ground control radar sites. The Iraqi air defense system was so extensive that only Moscow was judged to be better defended than Baghdad. Because of this, only unmanned cruise missiles and the nearly invisible Stealth aircraft penetrated deeply into Iraq at first. The first goal was to create gaps in the Iraqi air defense and open the way for more conventional aircraft. F-4G Wild Weasel aircraft broadcast strong radar jamming signals and also recorded Iraqi radar signals, playing them back with various delays to clutter Iraqi radar displays with floods of false targets.

Development of Modern Cruise Missiles

Cruise missiles are theater weapons. Early cruise missiles, such as the Snark, the Matador, and the Hound Dog, deployed in the 1950's and 1960's, suffered from various problems, especially unreliability and inaccuracy. However, as bombers found it ever more difficult to penetrate improved air-defense systems, stand-off, unmanned weapons became increasingly attractive. Eventually improvements in engine technology and guidance systems led to the modern cruise missiles originally deployed in the 1980's and used during and after the Gulf War.

The Tomahawk cruise missile is launched from surface ships and submarines with a solid propellant rocket that burns for twelve seconds, after which a small turbofan motor takes over and propels the missile at 880 kilometers per hour (550 miles per hour). The Tomahawk is not easy to shoot down, because it is difficult to track. Detection by radar is difficult, because the missile is small and cruises at only 15 to 30 meters above the ground. Detection by infrared sen-

sors is also difficult, because the turbofan motor puts out very little heat.

All versions of the Tomahawk use an inertial navigation system (INS) while over water. The INS has four crucial elements: gyroscopes, inertial masses, a computer, and an accurate clock. By measuring the magnitude and duration of the forces on the inertial masses and by using the gyroscopes to establish direction, the computer can calculate the missile's acceleration, velocity, and position. If the computer finds that the missile is not where it should be, commands can be sent to the flight control surfaces to correct its course.

The Tomahawk BGM-109B is a ship-to-ship weapon with a range of 470 kilometers. When it reaches its target area, it circles until it locks onto the enemy ship's radar or locates the ship with its own radar. It carries a 450-kilogram semi-armor-piercing warhead and can either strike the target broadside or pop up and dive down on the target. A ground-launched Tomahawk, the BGM-109A, was briefly deployed in Europe but was removed under a provision of the 1988 Intermediate-range and shorter-range Nuclear Forces (INF) treaty. The Tomahawk has a range of 2,500 kilometers and carries a 200-kiloton nuclear warhead. In addition to INS, the Tomahawk has a Terrain Contour Matching System (TERCOM), which, at selected checkpoints, scans the terrain with radar, comparing topographical features against stored data and correcting its flight path as necessary. To avoid detection, the radar remains off most of the time. The accuracy of the Tomahawk's TERCOM system was such that 50 percent of the missiles would hit within 45 meters of their targets, close enough for the 200-kiloton nuclear warheads to destroy the targets.

The Tomahawk BGM-109C and Tomahawk BGM-109D have ranges of 1,600 kilometers. Both weapons use, in addition to INS and TERCOM, the Global Positioning System (GPS). When they near their targets, they also employ a Digital Scene Matching Area Correlator (DSMAC) that compares images from an electronic camera in the missile nose against stored data. The DSMAC system makes these weapons exceptionally accurate, reducing their error probability to 10 meters. The missile can hit the target horizontally, pop up and dive down on the target, or fly over and burst above the target. The 109D is similar to the 109C but dispenses 166 BLU-97/B Combined Effect Munitions (CEM). Each CEM is about the size of a soft-drink can, weighs about 1.5 kilograms, and consists of three types of submunitions: fragmentation, incendiary, and shaped-charges that can penetrate 13 to 18 centimeters of armor. The 109D can dispense the CEMs in batches on several targets.

The air-launched cruise missile (ALCM) AGM-86 uses INS, TERCOM, and GPS guidance systems. It originally carried a 200-kiloton nuclear warhead but has been converted to carry a massive 900-kilogram (2,000-pound) blast-fragmentation warhead that sprays a cloud of ball bearings. The ALCM is designed to destroy dispersed, soft targets such as surface-to-air missile batteries. B-52G and B-52H bombers can carry twelve missiles in external racks, and some B-52H bombers can carry eight more missiles internally.

On January 17, 1991, at the start of the Gulf War, 297 Tomahawks were prepared to be launched from ships, but nine failed prelaunch tests. Of the 288 actual launches, 6 failed to cruise and 242 (81 percent of those launched) hit their targets. At about the same time, high-flying bombers launched thirty-five ALCMs at targets in Iraq. Televison reporters watched in amazement as missiles streaked past their hotel and made right turns into the next street on their way to their targets.

In January, 1993, forty-five Tomahawks were launched against Iraqi nuclear development facilities and similar targets. In September, 1995, thirteen Tomahawks hit surface-to-air missile sites in Bosnia. As a response to Iraqi harassment of Western aircraft patrolling the no-fly zone, 13 ALCMs were fired from B-52Hs and thirty-one Tomahawks were fired from ships in the Persian Gulf in September, 1996. In response to the terrorist bombings of U.S. embassies in Kenya and Tanzania, thirteen Tomahawks destroyed a suspected chemical weapons factory in the Sudan, and sixty-six Tomahawks hit guerrilla training camps in Afghanistan in August, 1998. Striking against weapons of mass destruction and Iraqi air-defense sites in December, 1998, the United States

and Britain attacked about one hundred targets in central and southern Iraq. They used fighters, bombers, ninety ALCMs, and 330 Tomahawks. In March, 1999, NATO (North Atlantic Treaty Organization) forces struck targets in Yugoslavia and Kosovo with fighters, bombers, and one hundred cruise missiles.

Cruise missiles seem to have become the weapon of choice in many situations. Although laser-guided bombs can be up to ten times more accurate and are significantly less expensive to build, they put pilots at risk. Even though a few cruise missiles do go astray and cause unintended damage, they have proven accurate enough and reliable enough to be used against targets surrounded by civilians. Future upgrades will cut the production costs of cruise missiles in half by discontinuing the capability to launch them from torpedo tubes, including a small television camera for tracking the target, replacing mechanical gyroscopes with laser-ring gyroscopes, and giving them the ability to be redirected to new targets while in flight.

DEVELOPMENT OF INTERCONTINENTAL BALLISTIC MISSILES

After World War II, the United States and the Soviet Union experimented with captured German V-2 rockets and worked to develop intercontinental ballistic missiles (ICBMs). In 1957 the Soviets launched an SS-6 Sapwood multistage ballistic missile and also put the first two artificial satellites, Sputnik 1 and Sputnik 2, into orbit. (A multistage rocket has the advantage that the excess weight of spent stages can be discarded.) The United States suddenly perceived a "missile gap" and reinvigorated its own missile program. The first U.S. satellite, Explorer 1, was lifted into orbit by a Juno 1 rocket atop a Jupiter C on January 31, 1958. The Jupiter ICBM was declared operational in 1958 and deployed in Italy and Turkey, while the Thor missile became operational in 1959 and was deployed in the United Kingdom. Both missiles were liquid fueled, with ranges of 3,200 kilometers. They had inertial guidance systems and carried 1.5-megaton nuclear warheads.

The Soviet SS-6 had a range of about 5,600 kilometers (3,500 miles) and had to be launched from northern latitudes in order to reach the United States, but the bitter northern cold often rendered the missile inoperable. Perhaps in response to the failure of the SS-6 and to the deployment of the Thor and Jupiter, the Soviet Union attempted to base SS-4 Sandal missiles in Cuba, thereby precipitating the Cuban Missile Crisis of 1962. The SS-4 carried a 1-megaton warhead and had a range of about 1,600 kilometers. After coming to the brink of nuclear war, the Soviets withdrew these missiles. Not long afterward, the Jupiter and Thor missiles were retired from service in 1964 and 1965, respectively.

Missiles deployed in the homeland are not subject to the consent of other nations. The Atlas and Titan I missiles were both deployed in the United States in 1959. These were liquid fueled, carried 2- to 4-megaton warheads, and had inertial or radio-inertial guidance systems. The Atlas had a range of about 16,000 kilometers and used liquid hydrogen. The Titan I was a two-stage missile with a range of about 10,000 kilometers. It used liquid oxygen, a cryogenic (supercold) liquid that had to be pumped onboard during a lengthy procedure during launch preparation. The Titan II used storable liquid fuels that could remain in the missile so it could be launched more quickly. It weighed 148 metric tons (325,000 pounds) at liftoff and was the largest missile ever deployed by the United States. More than 30 meters long and 3 meters in diameter, it had a range of 14,500 kilometers and a throw weight of 3.6 metric tons. It delivered a 9-megaton nuclear warhead, so it did not matter that its CEP was 1.6 kilometers.

SOLID-FUEL ROCKETS

Because a Soviet ICBM could reach the United States in thirty-five minutes, the United States needed antiballistic missiles (ABMs) that could be fired in minutes, so solid-fuel rockets were developed. Solid fuels are more stable than liquid fuels and do not require heavy pipes and pumps. Although they were always ready to fire, they made flight control more difficult, because solid-fueled rockets could not be throttled back nor use gimbal-mounted motors to steer. The Minuteman I became operational in 1962 and was the first U.S. solid-fueled missile. It

was held ready in a underground silo and had a range of 10,000 kilometers.

In the mid-1960's, the Soviets, the British, and the United States equipped some of their missiles with multiple reentry vehicles (MRVs), warheads that separated before the missile returned into the atmosphere. Several warheads from the same missile striking the target area made it more likely that the target would be destroyed. In 1982 the British used MRVs to incorporate penetration aids such as decoys, radar-reflecting chaff, and electronic jammers in missiles designated to attack Moscow, which was protected by an antiballistic missile shield. The United States took the next step and developed multiple independently targetable reentry vehicles (MIRVs) to penetrate the nationwide antiballistic missile system that it feared the Soviets would build. The missile payload was now a bus that could maneuver in space and send its warheads to different targets. It had to be liquid fueled so that it could repeatedly start and stop its rocket motors. The United States deployed its first MIRVed missile, the Minuteman III, in 1970. Its first three stages were solid fueled, with a range of 13,000 kilometers and a CEP of 365 meters. That was close enough because it carried three 200- to 350-kiloton nuclear warheads.

The United States feared that not enough Minuteman missiles in its silos would survive a Soviet preemptive strike and decided to build a mobile missile, the MX Peacekeeper. It carried up to ten 300-kiloton nuclear warheads, with a range of 11,000 kilometers and a CEP of 90 meters. Because no satisfactory mobile basing plan was found, the MX was housed in Minuteman silos. Its radically improved accuracy was due to a new inertial guidance system in which the gyros and accelerometers were housed in a floating ball. It also updated its position by sighting stars or certain satellites. Many consider the MX to be a first-strike weapon, because it is accurate enough to destroy missiles in their silos.

The Strategic Arms Reduction Treaty II (START II, 1993-2000) required the United States to remove MIRV capability from its ICBMs. Although the treaty was never formally put into force, both the United States and Russia generally followed its provisions. MX missiles were retired and Minuteman III missiles were refitted with single 300-kiloton warheads. Their updated guidance systems have a CEP of 100

U.S. Department of Defense

A Minuteman III missile being launched from Vandenberg Air Force Base in California.

meters. Trident submarine missiles were allowed to continue to carry up to eight warheads. Russia was required to make corresponding reductions.

NATURE AND USE OF NUCLEAR WEAPONS

When a conventional explosive is detonated, it takes but a tiny fraction of a second for chemical reactions to turn the explosive into high-pressure gases. The subsequent rapid outward expansion of these superhot gases is the explosion. Rapidly occurring nuclear reactions can do the same thing, but because nuclear forces are one million times stronger than chemical forces, the energy released is one million times greater.

Nuclear explosive devices are difficult to make and involve two basic kinds of nuclear reactions: fission and fusion. The bombs dropped on Hiroshima and Nagasaki were fission weapons. In a fission chain reaction, neutrons strike nuclei of plutonium or uranium 235, causing them to split roughly in half. In doing so, they release two to three new neutrons, along with a great deal of energy. Uranium 235 is the isotope of uranium that has 92 protons and 143 neutrons in its nucleus. It fissions, or splits, more readily than the more common uranium 238, which has 92 protons and 146 neutrons. Isotopes that readily fission and sustain a chain reaction are said to be fissile. The most common fissile isotopes are uranium 235, which must be painstakingly separated from the far more abundant uranium 238, and uranium 233 and plutonium, which must be made in nuclear reactors.

For a nuclear explosion to occur, the chain reaction must be supercritical; that is, each fission must lead to more than one new fission. For example, suppose that each fission produced two neutrons and that each of these two neutrons produced two new fissions. If there were two fissions in the first generation, there would be four in the second, eight in the third and 2^N in the *N*th generation. At this rate, every nucleus in 17 kilograms of uranium could fission in fewer than 85 generations. This would take less than two-millionths of one second.

The minimum amount of uranium required to produce an explosion is called the critical mass. Critical mass depends not only on the amount of material present but also on its shape and on the materials surrounding it. If there is less than a critical mass, too many neutrons escape from the uranium without producing fissions, and the process fizzles out. The critical mass of weapons-grade uranium-235 metal is 17 kilograms, if it is surrounded by a good neutron reflector. The critical mass of weapons-grade plutonium metal is only 4 kilograms, but that increases to 10 kilograms without a neutron reflector. A critical mass cannot be assembled before it is intended to explode, because a stray neutron produced by a cosmic ray could initiate an untimely explosion.

The atomic bomb dropped on Hiroshima on August 6, 1945, weighed 4.4 metric tons (9,700 pounds) and had a yield equal to 14.5 kilotons of the high explosive TNT. The yield was about 1.3 percent of the maximum possible yield for the amount of fissile material used. The core contained 60 kilograms of uranium 235, surrounded by 900 kilograms of uranium 238 to serve as a tamper and neutron reflector. The inertia of the tamper briefly slows the core's expansion and allows a few more generations of fission to occur. To keep it below critical mass, a large segment of the uranium-235 core was removed and placed into a short cannon. When the Hiroshima bomb fell to 680 meters above the ground, the cannon fired the missing segment into the core. That action also mixed a small amount of beryllium and radioactive polonium 210, a combination that produced a flood of neutrons. Two-thirds of the city was destroyed in the explosion, and about 140,000 people were killed, either immediately or within a few months from injuries they sustained during the explosion.

The bomb that was dropped on Nagasaki on August 9, 1945, used plutonium, primarily plutonium 239. When plutonium is made in a nuclear reactor by adding neutrons to uranium 238, plutonium 240 and plutonium 242 are also formed. The latter two isotopes can spontaneously fission and produce too many neutrons to make gun assembly predictable. The Nagasaki bomb used 6.1 kilograms of plutonium in a noncritical configuration. This plutonium core was surrounded by 2,300 kilograms of high explo-

sives. When the explosives were detonated simultaneously from all sides, the resulting implosion compressed the plutonium core to twice its normal density, thereby achieving critical mass. The resulting nuclear explosion had a yield of about 23 kilotons of TNT, 17 percent of the maximum possible yield for that amount of plutonium. About 70,000 people were killed either immediately or within a few months.

For several years weapons scientists speculated about building "the super," in which light elements would be fused into heavier elements and give off a great deal of energy in the process. After the Soviets exploded their first atomic bomb in 1949, work on the hydrogen bomb, as it is now called, began in earnest. Edward Teller (born 1908) and Stanislaw M. Ulam (1909-1984) had the key insight of how to use an atomic bomb to create the high temperature and pressure necessary for fusion.

Inside a 300-kiloton hydrogen warhead may be a uranium-238 cylinder about 1 meter long and 0.5 meter in diameter. Inside the cylinder at one end there is a small fission bomb about the size of a soccer ball that serves as a nuclear trigger. A fat rod of lithium deuteride (LD) lies along the cylinder's axis with a slab of uranium 238 (the pusher) between it and the trigger. Deuterium is heavy hydrogen, and its nucleus is a proton-neutron pair. A thin plutonium rod (the spark plug) lies along the center of the LD rod, and the outside of the LD rod is covered with a uranium-238 tamper. The space around the rod is filled with plastic foam. The exploding trigger creates a pressure of 1 billion atmospheres and a temperature of 100 million Kelvins. X rays turn the foam into plasma while the outer uranium cylinder momentarily channels the energy and pressure onto the LD rod. As the rod and its plutonium core compress, neutrons cause the spark plug to fission, and then lithium fissions into tritium, a proton linked to two neutrons, and helium. Tritium and deuterium now fuse, releasing a tremendous amount of energy along with high-energy neutrons. These neutrons cause part of the outer uranium cylinder to undergo fission as it disintegrates. Hence this is a fission-fusion-fission weapon.

By 1964, the Soviet Union (1949), the United Kingdom (1952), France (1960), and China (1964) had all developed nuclear weapons. In an attempt to prevent further expansion, the Non-Proliferation Treaty (NPT) was negotiated in 1968. Although it was generally effective in discouraging further development of nuclear weapons, India, Israel, and Pakistan failed to sign the treaty and later acquired nuclear capability. Iran, North Korea, and Syria are widely regarded as supporting programs that might lead to the development of nuclear weapons.

During the Cold War, Warsaw Pact nations equipped and maintained an army twice the size of that of the defending North Atlantic Treaty Organization (NATO) forces. In an effort to make up for this imbalance, the United States deployed many tactical nuclear weapons with yields of about 10 kilotons or fewer. The most notorious of these was the neutron bomb, or Enhanced Radiation Weapon (ERW). One version was a projectile for an 8-inch howitzer (artillery gun) with a range of about 17 kilometers. A second version was a warhead for the Lance missile with a range of about 130 kilometers. These warheads were fission-fusion devices, small plutonium bombs containing tritium, with a 1-kiloton yield. The blasts of such warheads would destroy buildings within a radius of 760 meters (0.5 mile), and the neutron radiation would kill unshielded people at about twice that distance. Strategists argued that because these weapons caused less collateral damage than larger weapons, the Warsaw Pact nations would believe that they were more likely to be used and would be deterred from attacking. These weapons were kept ready for use for about ten years, after which they were included in the nearly 7,000 nuclear warheads and bombs retired at the end of the Cold War.

Development of Nuclear Strategies

World War II military strategists used the Nagasaki bomb to show that the Hiroshima bomb had not been a fluke and that more such bombs would be used if necessary. This ploy was partially a bluff, given that the next bomb would not have been ready to deploy until the end of August, 1945. However, the Japanese

initiated surrender negotiations the day after Nagasaki was destroyed. Most historians agree that the use of these nuclear weapons probably saved more lives than they took, because they ended the war quickly and without the necessity of invading the Japanese homeland. Even as World War II ended, the Cold War with the Soviet Union had already begun. As the only nation with nuclear weapons, the United States could threaten to use them without fear of retaliation in kind. As the West disarmed, nuclear weapons were seen as a relatively cheap substitute for maintaining a large military force, and the United States began building a large nuclear stockpile.

Several years before the Western Allies believed it would happen, the Soviets exploded a plutonium bomb on August 29, 1949. In response, the United States developed the hydrogen bomb, first testing it in 1952. The Soviets tested a hydrogen bomb only one year later. To contain communism, the United States threatened "massive retaliation" if the Soviets committed unspecified aggression anywhere in the world. The Soviets could have been attacked from bomber bases in Europe or, after 1948, by intercontinental bombers based in the United States.

After the Soviets had developed a large number of nuclear weapons and its own intercontinental bomber force in 1955, the doctrine became "mutual assured destruction" (MAD). With each country able to destroy the other, neither could afford to try anything foolish. MAD required that the United States be able to absorb a nuclear attack by the Soviets and still deliver a devastating response. It was seriously proposed that nuclear missiles be placed on the Moon, because missiles aimed at the Moon would take days to arrive, and during that time, U.S. bombers could hit the Soviet Union. If, instead, the Soviets first targeted the continental United States, missiles from the Moon could be launched at the Soviet Union. A more practical course was taken by building up a triad of nuclear bombers, ICBMs, and submarine-launched missiles. It was judged that the Soviets could not destroy enough of the triad in a preemptive strike to escape overwhelming retribution.

Intercontinental bombers might take fifteen hours to reach their targets, and they could be recalled in case of a false alarm. ICBMs put a hair trigger on MAD, because they take only thirty minutes to reach their targets and, once underway, cannot be recalled. Missiles launched from nearby submarines might take only seven to fifteen minutes to reach their targets. As missiles became more accurate, warhead yield was reduced from multimegatons to between 100 kilotons and 475 kilotons, and a "counterforce" doctrine was introduced, in which the enemies' armed forces, particularly their nuclear weapons, were targeted. In the belief that the Soviets were less likely to try something if they were more sure that the United States would not hesitate to respond, the doctrine of "flexible response" was advanced in the early 1980's. This meant that, in place of MAD, the U.S. response would be commensurate with the scope of the enemy attack. Many found flexible response to be a very disturbing policy, because it made the use of nuclear weapons no longer unthinkable. They feared that any limited nuclear war would escalate into full-scale nuclear war. Fortunately, perhaps because of MAD, the nuclear powers have gone to great lengths to avoid directly fighting each other, and there has been no further use of nuclear weapons.

The nuclear stockpile of weapons in the United States peaked in 1966 at about 32,000, more than four times the number possessed by the Soviet Union. Soviet stockpiles peaked in 1986 at about 41,000. As a result of a series of agreements that began with the Strategic Arms Reduction Treaty I (1991), by 2009 those numbers had been reduced to about 10,000 in the United States (with 6,700 in reserve or waiting dismantlement) and 13,000 in Russia (with 8,100 in reserve or waiting dismantlement). These numbers tell only part of the story, however, as different types of nuclear weapons have varying yields of power.

With the election in the United States of President Barack Obama in 2008, new impetus was given to the reduction of nuclear arsenals. Speaking in Prague in April of 2009, Obama argued that the United States had "a moral responsibility to act" and committed America to "a world without nuclear weapons." Among the steps he planned to pursue were negotiation of a new strategic arms reduction treaty with Russia, ratification of the Comprehensive Test Ban

Treaty, and a new treaty ending production of weapons grade nuclear materials. Although none of these had been achieved by the end of 2009, his efforts gained worldwide attention and widespread international support. In bestowing on Obama the 2009 Nobel Peace Prize, the committee "attached special importance" to his "vision of and work for a world without nuclear weapons."

Development of Missile Defense and Antiballistic Missiles

Thirty-six nations possess ballistic missiles of some type, and fifty-two nations have antiship cruise missiles. Doubtless, defenses against missiles have been sought ever since missiles became effective weapons. British fighter planes were able to shoot down some V-1's, and the more daring pilots flew alongside, slipped a wing under the V-1, and then tipped it, confusing the V-1's primitive autopilot and sending the missile into a dive. There was no defense against the V-2's. In the 1982 Falkland Islands War, there was no defense when the HMS *Sheffield* was lost to a French Exocet cruise missile launched by the Argentinian air force. An Iraqi air force pilot flying a French-built Mirage fighter mistakenly launched two Exocets at the USS *Stark* in 1987. Thirty-seven sailors died, and twenty-one others were wounded. The *Stark* was protected by a Phalanx close-in weapon system (CIWS), but it failed to fire because of a tragic mistake: Because France was an ally, Exocets were tagged as friendly.

The Phalanx system is deployed on nearly all U.S. Navy ships and in the navies of several allied nations. The Phalanx is a fast-reaction, rapid-fire 20-millimeter gun system. First deployed in 1978, current models fire 4,500 rounds per minute, although the magazine holds only 1,550 rounds. The rounds are hard and dense—they were originally made from depleted uranium but are now made of tungsten—and they fly at very high speeds. Their muzzle velocity is 1,113 meters per second, more than three times the speed of sound. The system uses radar and a forward-looking infrared (FLIR) detector to locate and track targets automatically. The FLIR is the ship's last line of defense against incoming missiles and aircraft, and a recent upgrade allowed it also to engage small, fast-moving surface craft during both day and night.

The Avenger Pedestal-Mounted Stinger system can shoot down cruise missiles. It is mounted on a heavy high-mobility multipurpose wheeled vehicle (HMMWV). A gyro-stabilized turret gives it a shoot-on-the-move capability. The gunner's turret has a .50-caliber (12.7-millimeter) machine gun and eight Stinger missile launch pods. It has a forward-looking infrared sensor, laser range finder, and a video autotracker. It can also receive tracking cues by radio from a nearby radar set, if one is available.

The Patriot missile was originally an antiaircraft weapon but was hurriedly modified in the mid-1980's to defend against ballistic missiles. A phased-array radar locates the target and directs the missile to it. As it nears the target, the missile homes in on radar waves reflected from the target, then a proximity fuse detonates a 90-kilogram, high-explosive warhead. At first the Patriot missile seemed to be very successful at stopping Iraqi Scud missiles during the Gulf War (1990-1991). Later analysis showed that many of the Scuds simply broke apart as they hit the lower atmosphere at high speed, and that the Patriot usefully destroyed some of the debris. Other Scuds were only knocked off course by Patriot explosions, but certainly the Patriot missile was at least a partial success. The Patriot missile and radar, upgraded to the Patriot Advanced Capability-3 (PAC-3), was scheduled to deploy alongside earlier Patriot missiles in 2012. Although slower than some earlier models, it has hit-to-kill capabilities, and can protect five times the area.

In March, 1983, U.S. president Ronald Reagan gave dramatic impetus to the development of missile defenses with announcement of his Strategic Defense Initiative (SDI), with the "ultimate goal of eliminating the threat posed by strategic nuclear missiles." This spawned a series of expensive and technologically unproven initiatives, including the creation of laser defenses, that led critics to dub the program "Star Wars," after the fantasy film series of the same name. By 1993, the program was renamed Ballistic Missile Defense Organization (BMDO), and the emphasis had shifted from national to regional

defense. Although a comprehensive global defense system was never developed, a number of the technologies emanating from the SDI were pursued and eventually deployed.

Testing of weapons using high-energy lasers has demonstrated the technology's battlefield potential for combating missile attacks. Israel and the United States collaborated in developing a Tactical High Energy Laser (THEL) system, which was expected to be useful against short-ranged (20-kilometer) Katyusha rockets frequently employed against Israel by Hizbullah units. The system's weakness against medium- and long-range missiles led to interest in various mobile systems (MTHEL), including the creation of a prototype of airborne units, unveiled in 2006. With funding for the MTHEL discontinued by the United States in 2004, its deployment became unlikely in the short term. The first generation of lasers required chemical reactions to produce high amounts of energy in a short period of time, usually burning ethylene with nitrogen trifluoride before adding deuterium. Studies suggested that effective MTHEL systems would require electrically produced lasers, which likely could not be deployed until the 2010's.

The Navy Area Theater Ballistic Missile Defense (TBMD) system was developed to protect U.S. and Allied forces and areas of vital national interest against theater ballistic missiles. The lower-tier defense uses Aegis cruisers and destroyers, which have phased-array radars and battle management computers that can simultaneously detect and track more than one hundred targets. Incoming enemy missiles are intercepted with the Standard Missile (SM)-2, which has a range of 185 kilometers. Missiles slipping through that defense are then engaged by the Phalanx system. As a result of massive cost overruns in perfecting radar and SM-2 Block IVA capabilities, the Department of Defense canceled the program in December, 2001, though upper-tier defense uses the Terminal High Altitude Area Defense (THAAD) system's long-range, hit-to-kill interceptor, which was first activated in 2008. Surviving enemy missiles aimed at ground targets are then engaged by the Patriot (PAC-3) system. Arrow-2 is a two-staged interceptor developed jointly by the United States and Israel. It uses a blast-fragmentation warhead to destroy enemy missiles and has a range between those of the Patriot and the THAAD interceptor. It could be employed by the United States if deemed necessary.

The lower tier of the theater missile defense systems seems to be well founded. The upper-tier THAAD interceptor is less well developed, and the National Missile Defense (NMD) system is even further from deployment. The first attempt at an NMD was the Safeguard antiballistic missile system. It used longer-ranged (748 kilometers) Spartan missiles with 5-megaton warheads and shorter-ranged (40 kilometers) Sprint missiles with low-kiloton yield warheads. The Sprint warheads were enhanced-radiation devices intended to cripple incoming warheads with neutron radiation. Unfortunately, they had a fatal flaw—the first few nuclear explosions destroying incoming missiles would have blinded the acquisition and tracking radar. The system was built despite the known flaw, but it remained active for only four months in 1976.

An ABM system can attack missiles as they rise through the atmosphere (boost phase) and are most vulnerable; as they coast through space (mid-course phase), when decoys are the most effective; or as they plunge back into the atmosphere over the target (terminal phase), when time is short. The boost phase lasts from three to five minutes; the mid-course phase, up to 20 minutes; and the terminal phase, about 1 minute. To maintain enough assets in orbit to destroy a massive attack during launch would be prohibitively expensive. In fact, since MIRVed warheads and decoys are cheaper than antiballistic missiles and their support system, it is cheaper to overcome an ABM system with a massive attack than it is to build an ABM system extensive enough to stop a massive attack.

However, it might be practical to stop a limited attack. Such an attack might be a missile, or a few missiles, launched by a renegade military commander or by a rogue nation. Although none of these scenarios seems likely, any of them could kill thousands of people or many more. This fact makes it worthwhile to at least consider a defense against them. In the quarter century since the development of the Safeguard system, technology has advanced to the point that it is now possible "to hit a bullet with a bullet";

however, current systems are more effective against shorter-ranged missiles than they are against longer-ranged missiles.

If built, the National Missile Defense system would have several elements. Large, phased-array surveillance radars would detect and track missiles aimed at the United States. X-band radar has a shorter wavelength than normal radar and can therefore see finer detail. Ground-based X-band radar would be used to track targets and discriminate against decoys. Infrared sensing satellites already in orbit monitor the Earth to detect the hot exhaust gases of missile launch. This system was used to detect Scud launches during the Gulf War. The Space-Based Infrared System (SBIRS) would be an expanded and modernized version of the current system. It would acquire and track the missiles shortly after launch and provide the greatest warning. The system's weapon component is the Ground-Based Interceptor (GBI), a missile always kept ready to launch a Kill Vehicle (KV) into space. The KV would have its own sensors, propulsion, communications, and guidance systems and would maneuver to the target, distinguish decoys, and destroy the target in a high-speed collision. Concern over the possibility of attacks from rogue states and terrorist groups led to continued government funding of SBIRS, despite its prohibition by the Anti-Ballistic Missile (ABM) Treaty signed by the United States and Russia in 1972. The United States unilaterally withdrew from the treaty in 2002.

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Charles W. Rogers

Chemical and Biological Weapons

Dates: Since c. 1500

Nature and Use

Both chemical and biological weapons are considered "silent weapons of mass destruction." The distinction between chemical and biological warfare is important because of differences in the scientific research and technological development that have influenced their use in war.

Chemical weapons are inanimate substances, usually gaseous or liquid, that can rapidly cause death or disability. Since antiquity, poisons have been used as a fatal means of settling interpersonal conflict. Thus, knowledge of poisons must be considered the precursor to chemical weapons development. Poison science emerged as soon as humans developed a consistent technique for recognizing the detrimental properties of natural plant, animal, or mineral extracts. However, large-scale production of artificial chemicals required substantial technological advancements to facilitate both mass production and the safe deployment of dangerous chemicals against opponents in war. Chemical weapons have also been targeted against plants and animals for the purpose of debilitating agriculture and food resources; such chemicals are more adequately categorized by the familiar labels of herbicides and pesticides.

Biological weapons are preparations of live microorganisms that can rapidly cause debilitating disease and death in exposed populations. Pathogenic bacteria, viruses, and fungi with low infectious doses and high environmental survival rates are the primary components of biological weapons. Inanimate microbial products, such as fungal toxins, have also been developed as weapons, but these are better labeled as chemical weapons. By definition, biological weapons include pathogens targeted at domesticated plants and animals as a strategy for starving agricultural productivity. The use of biological weapons predates both the establishment of the germ theory of disease and the scientific understanding of the discrete nature of pathogens.

Development

Chemical Weapons

Three distinct classes of chemical weapons have existed throughout the developmental history of chemical warfare. The first, lethal agents, cause death at various degrees of potency, depending on the biochemical properties of the components. The second, incapacitating agents, are used to render soldiers incompetent for battle, and they generally do not kill more than 2 percent of exposed populations. The third, irritating agents, such as lachrimators, or tear gases, make it difficult for soldiers to fight without wearing cumbersome protective gear, such as face masks and respirators. Irritating agents are generally nonlethal to all except individuals with preexposure conditions, such as asthma.

There have been at least five generations of chemical weapons since the 1500's. The first generation predated the development of the large-scale industrial production facilities that facilitated the first concerted use of chemicals during World War I. Second-generation chemical weapons, mostly respiratory impairment gases, were developed for use during World War I. Third-generation agents, mostly nerve gases, were developed after World War I. Fourth-generation agents include psychoactive chemicals capable of inducing hallucinations in exposed individuals. Fifth-generation chemical weapons include new combinations of previously known chemical weapons, combinations of chemical and biological agents, or binary chemical weapons, which are endowed with innovative modes of delivery and action.

The first generation of chemical weapons in the

modern era is traced to artist and inventor Leonardo da Vinci's (1452-1519) description of shells loaded with very fine sulfur and arsenic dust. There is no evidence that Leonardo da Vinci's chemical weapon was actually used, so it is impossible to judge its effectiveness, but the description clearly marks the development of a weapon based on the coupling of specific chemicals with propelled contraptions. The second notable development after Leonardo da Vinci was the unsuccessful proposal developed between 1811 and 1855 by Thomas Cochrane (1775-1860), British naval officer and tenth earl of Dundonald, to use smoke from burning coal tar and carbon disulfide against French and Russian opponents.

The second generation of chemical weapons, developed toward the end of the nineteenth century, includes chlorine and phosgene. Chlorine was discovered and used as a bleaching agent before the end of the eighteenth century, and phosgene was discovered in 1812 as a product of the reaction between chlorine and carbon monoxide. Prohibition of poisonous gases was on the agenda of the first Hague Peace Conference, convened in 1899 by Czar Nicholas II (1868-1918). Although detailed knowledge of the manufacture and use of chemical weapons was limited, the U.S. delegation to the 1899 conference took a lone position in refusing to ratify an agreement to abstain from the use of "asphyxiating or deleterious gases." The second Hague Peace Conference, convened by President Theodore Roosevelt in 1907, expanded the prohibition to include "poison or poisoned weapons." The Hague conference agreements remained in force until April 22, 1915, when Germany used chlorine tear gas in Ypres, Belgium, against Franco-Algerian soldiers during World War I.

Although hundreds of chemicals have been tested for military purposes since 1915, fewer than 5 percent of them proved to be of significance to weapons development. The Geneva Protocol, signed by several countries on June 17, 1925, for the "prohibition of the use in war of asphyxiating, poisonous, or other gases and of bacteriological methods of warfare," did little to deter the development of new chemical weapons or the improvement of delivery of old ones. Among the chemicals mentioned were organophosphorus nerve agents, which constitute the

TURNING POINTS

CHEMICAL WEAPONS

1500-1855	Toxic smoke weapons include arsenical compounds.
1845-1920	Asphyxiating gas weapons include the industrial-scale production of chlorine and phosgene.
1920-1960	Nerve gases, such as tabun and sarin, are developed to inhibit nerve function, leading to respiratory paralysis or asphyxia.
1959-1970	Psychoactive chemical weapons are developed to produce hallucinations in exposed individuals.
1970-present	Binary chemical weapons, stored and shipped in their component parts, are developed to increase quantities that can be safely transported to deployment sites.

BIOLOGICAL WEAPONS

300 B.C.E-1763 C.E.	During the miasma-contagion phase, environments are deliberately polluted with diseased carcasses and corpses.
1763-1925	During the fomites phase, specific disease agents and contaminated utensils are introduced as weapons, with smallpox, cholera, and the bubonic plague as popular agents.
1925-1940	During the cell culture phase, biological weapons are mass-produced and stockpiled; Japan's research program includes direct experimentation on humans.
1940-1969	During the vaccine development and stockpiling phase, there are open-air tests of biological dispersal in urban environments in the United States.
1969-present	During the genetic engineering phase, recombinant DNA biotechnology opens new frontiers in the design and production of biological weapons.

Hulton Archive/Getty Images

British soldiers wear gas masks to protect against respiratory-impairment gases as they wield a Vickers machine gun at the Battle of the Somme, July, 1916.

third generation of chemical weapons. Nerve gases inhibit certain cholinesterase enzymes that affect nerve function and lead to excessive sweating, uncontrollable vomiting and defecation, and, finally, death from respiratory paralysis or asphyxia. Tabun and sarin were discovered by chance in 1936 and 1938, respectively, by the German scientist Gerhard Schrader (1903-1991), who was conducting research on pesticides for the company I. G. Farbenfabriken. Tabun persists in the environment, whereas sarin dissipates rather quickly. Tabun was the first nerve gas to be manufactured on a large scale, and it was stockpiled by Germany during World War II.

Nazi Germany's use of lethal gas and other countries' capacity to develop and manufacture chemical weapons led to a post-World War II emphasis on defense strategies against chemical weapons. Sophisticated military reconnaissance strategies for chemical weapons included automatic detection systems such as the Nerve Agent Immobilized Enzyme Alarm Detector, which responds to small concentrations of nerve agents and cyanide. Similarly, equipment for personal and collective protection was rapidly developed, as were methods of environmental decontamination and medical treatment for exposed individuals.

Psychoactive chemicals, the fourth generation of chemical weapons, were developed between 1959 and 1965. The incentive was to calm the growing public distaste for the use of lethal chemicals. The

AP/Wide World Photos

U.N. workers prepare Iraqi rockets, reportedly filled with sarin, a chemical weapon that affects nerve function, for destruction after the Persian Gulf War.

best-known psychoactive chemical weapon is quinuclidinyl benzilate, known as BZ, a relative of the psychedelic drug lysergic acid diethylamide (LSD), which induces altered states of consciousness. In the United States, BZ was advertised in a publicity campaign known as Operation Blue Skies, intended to reduce public anxiety about chemical warfare. The campaign promoted the drug as one that caused only temporary insanity and paralysis of the will to fight, thereby pacifying violent individuals. However, BZ was too expensive for large-scale manufacture, and the dose required for effect was unpredictable.

Binary weapons are representatives of the fifth generation of chemical weapons. Binary artillery projectiles were developed in the United States in response to growing tensions during the Cold War era (1945-1991) and to the apparent superiority of Soviet chemical weapons. Between 1978 and 1985, research was intensified on the development of binary projectiles designed for deployment in war crises. In 1987 the United States designed a binary system to increase the quantity of sarin that could be transported to areas where it was required. The two chemicals that react to form sarin would be stored and shipped separately and then brought together at the gun site, where mixing and deployment could proceed rapidly and safely.

BIOLOGICAL WEAPONS

The development of modern biological weapons occurred in four distinct phases based on scientific advancements in the understanding of infectious diseases and the manipulation of microorganisms and ensuing technological innovations. The "contagion and miasma" phase (300 B.C.E.-1763 C.E.) occurred before the causative microbial origin of diseases was fully understood. During this period biological weapons consisted of attempts to contaminate the environment with actual bodies of diseased animals or humans. The second phase of biological weapons development (1763-1925) was marked by the use of fomites, or materials that have been in contact with diseased persons, used as weapons. The third, the "culture and stockpile" phase, involved the development of technical capacity to cultivate large quantities of microorganisms and vaccines. This period lasted from 1925 to 1969. The fourth phase, beginning in 1969, no less than a biological-science revolution, is marked by the development of genetic engineering, or recombinant DNA, facilitating the construction of organisms with new pathogenic traits.

Until the seventeenth century diseased corpses and carcasses were used as biological weapons by the Greeks, Romans, and Persians to contaminate drinking water and spread disease. Modern biological weapon development was initiated in 1763 when American military officers contemplated the use of smallpox-contaminated blankets against Native Americans in the French and Indian War; however, there is no concrete evidence that the proposal was implemented.

The discoveries of French chemist and microbiologist Louis Pasteur (1822-1895) greatly influenced the trajectory of biological weapons development in the nineteenth and twentieth centuries. During World War I, Germany allegedly used the plague and cholera against opponents in Russia and Italy, respectively. Anton Dilger (1884-1918), a German secret agent working in the United States, is credited with the development of batch culture techniques for producing large quantities of *Bacillus anthracis,* the causative agent of anthrax, and *Pseudomonas mallei,* the causative agent of glanders. Germany used these biological weapons to target horses and cattle in 1916 and was accused of dropping plague bombs and inoculating toys and candy in Romania.

The Geneva Protocol of 1925 condemned the use of biological and chemical weapons but did not restrict their development, research, or stockpiling. The U.S. Congress did not ratify the Geneva Protocol until 1975 and did so only after several reservations were added to the provisions relating to the use of banned agents against nonsignatory nations or violators of the protocol. The first dedicated biological warfare research program was established by the Soviet Union in 1929. Japan and the United Kingdom initiated similar programs in 1934, and the U.S. Army joined the race in 1941. Japan's biological weapons development program was particularly notable, because it involved tests and experimentation on human subjects.

During the Cold War period, intensive research and development on biological weapons was made. In 1943 the United States had established Fort Detrick in northern Maryland as the main center of biological weapons research. Canada, the United Kingdom, and the United States collaborated on modeling biological weapons dissemination, including the release of pathogens in the Caribbean Sea and open-air experiments in urban centers within the United States. By 1950 experiments on the aerial dispersal of pathogens had been conducted with *Serratia marcescens* and *Bacillus globigii* in San Francisco, California, and Norfolk, Virginia. Urban locale experiments to aid the development of biological weapons were conducted in the transportation subways of New York City in the 1960's. Nevertheless, the U.S. military concluded around 1969 that the potential usefulness of biological weapons was severely limited under battlefield conditions. This policy reversal led to the relaxation of international research and development programs on biological warfare. Consequently, there was widespread support for the 1972 Biological Weapons Convention on the "prohibition of the development, production and stockpiling of bacteriological (biological) and toxin weapons and on their destruction."

The fourth phase of biological weapons development effectively began in 1969, with the invention of recombinant DNA techniques. These new biotechnology techniques created endless possibilities of recombining pathogen attributes from a variety of sources to produce more potent biological weapons than those isolated directly from nature. An outbreak of anthrax in Sverdlovsk, in the Soviet Union, killed at least sixty-four people in 1979. By 1982 several reports had been published in Western news media on the use of genetic engineering in the Soviet biological weapons development program. In 1988 the potential impact of U.S. biological weapons testing in Utah's Dugway Proving Grounds was publicized. During the 1980's and 1990's, attention became focused on the relatively easy access that developing nations have to genetic engineering techniques for producing potent pathogens. Moreover, belief in the boundless potentials of recombinant DNA created the fear that it is virtually impossible to develop effective defense technology against biological weapons.

There were allegations that biological weapons were used during the Iran-Iraq War (1980-1988). In 1998 the defunct apartheid regime of South Africa was accused of developing and using biological weapons. The involvement of developing countries worldwide, and African countries in particular, in the development and use of biological weapons is particularly troublesome because the continent harbors some of the most deadly pathogens, including viruses such as the Ebola virus. The increasing incidence of antibiotic-resistant strains of pathogenic bacteria has been a relatively recent cause for alarm in the development of biological weapons. Antibiotic resistance traits can evolve naturally in microbial populations, but the dangerous traits can also be manipulated to render the defense strategies based on known medications ineffective.

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Modern Fortifications

Dates: Since c. 1500

Medieval Fortifications

Nature and Use

The fortifications of the sixteenth century differ little from those of medieval and ancient times with regard to key features such as moats, towers, and walls. In the field of strategic use, as they had in the past, fortifications provided protection for key positions and served a strategic role as part of greater defensive lines. This role became more dominant in the twentieth century. However, such continuous lines of defense were not unknown before the modern period, as attested by the Great Wall of China, built in the third century B.C.E. and spanning almost 1,500 miles, and Hadrian's Wall, built in the second century C.E. and extending more than 100 miles across Great Britain. The Romans also created hundreds of miles of less solid fortifications, known as the Limes, to close off other parts of their empire. During the Middle Ages, continuous obstacles forming a defensive line were found from England to as far east as Russia.

During the modern era, new forms of fortifications supplanted the castle and fortified cities in Europe. However, medieval-style fortifications remained in use in most of Asia, Africa, and the Americas. Thus, the major fortified sites of Japan, China, and the Indian subcontinent are more reminiscent of medieval cities than modern ones. Many fortifications in the Americas were also built in the more archaic style, with some notable exceptions, such as the sixteenth century Inca fortress of Sacsahuamán, overlooking Cuzco, and the easily defendable complexes of the Pueblo Indians of southwestern North America.

Development

It has long been assumed that the cannon brought about the demise of the castle in Europe. However, this is not totally true. Although castles with weak, high walls did indeed succumb to the cannon, others continued in service for centuries. In the 1970's a castle used by terrorists in Lebanon was able to resist the modern ordnance launched from Israeli jets. What did bring a major change to fortifications was the need to create positions that could more effectively mount cannons and resist cannon fire. Cannons mounted on high fortification walls proved less effective than those that were placed lower down, because they lacked "grazing fire," or the field of fire in which a projectile is able to strike any object within its path above a certain height. As a result, the walls of many fortifications were lowered and made wider to accommodate large artillery pieces. At the same time, they became smaller targets by presenting a lower profile.

The first of these "improved" fortifications were built in western Europe. Italian engineers initiated some of the first significant changes in the 1480's. The Sangallo family of architects designed new forts in the Italian peninsula in the late fifteenth and the sixteenth century and in 1493 added bastions to Rome's Castel Sant Angelo, originally built in 135-139 by the emperor Hadrian (76-138) as a mausoleum for himself and his successors. In the 1490's a member of the Sangallo family built Sarzanello, a hilltop fort of triangular shape that included rounded bastions and a triangular *ravelin*, or V-shaped outwork, to protect the entrance. The transition from medieval to Renaissance styles also appears in city fortifications during the end of the fifteenth century in places such as Civita Castellana, north of Rome, and the Greek island of Rhodes, where bastions were added and the walls were modified.

At Salses, in modern-day southwestern France, a modernized fortification was built in 1498, improving on the Italian designs. Salses proved too weak to resist French cannons at close range, however, and in 1503 it was redesigned with thicker walls, the height of which was already mostly concealed in a large

ditch that protected them from direct artillery fire. The guns mounted atop the walls of the fort were close to ground level, allowing grazing fire.

At the end of the 1530's, King Henry VIII (1491-1547) of England, facing the threat of invasion from the European continent, protected his coastline with a series of new forts designed to mount artillery and muskets. These forts, located near the beaches, consisted of a series of rounded bastions surrounding a central circular keep and sitting in a deep and wide dry moat. The best known of these forts are Deal, Walmer, and St. Mawes.

During the Renaissance, new forts built to secure key positions were large enough to resist the increasingly large armies that moved across Europe. When the Europeans arrived in America, they secured their hold on the land whenever possible with the newest type of stone fortifications. Otherwise, they relied on wooden stockades not much different from those used in the Middle Ages. The most interesting transfer of technology occurred in the sixteenth century, when the Portuguese helped the Ethiopians build castle-like fortifications at Gonder in northwestern Ethiopia. The influence of the new Renaissance techniques began in Africa with Portuguese forts from Ceuta (1415) to Mozambique (1506) and in Asia from Goa (1510) to Malaca (1511).

SEVENTEENTH AND EIGHTEENTH CENTURIES: VAUBAN AND BASTIONED FORTS

The seventeenth and eighteenth centuries marked the great age of "scientifically designed" fortifications. The masters of the art perfected their designs based on mathematical calculations, only modifying final plans to match the terrain. During this period, the bastion, with two fronts and two flanks attached to the curtain walls, became the dominant feature. Additional outworks were added for protection. The wide, deep moat acquired additional protective positions, low walls rose from its base, and a *glacis*, or gentle slope, was created to provide clear fields of fire.

During the sixteenth century the Italians lost their dominance in the field of military architecture and were replaced by the Germans, the Dutch, and the French, who developed their own schools of fortifications. The Dutch mathematician Simon Stevin (1548-1620) wrote a treatise on defenses, emphasizing the use of water features.

The French school included such masters as Jean Errard de Bar-le-Duc (1554-1610), who built a number of fortifications and in 1600 published a treatise on design in which he warned against reliance on geometrical calculations over design to suit the terrain. In 1640, Blaise François, comte de Pagan (1604-1665), emphasized the importance of the bastions and the use of detached bastions and outworks, including listening galleries to deter mining operations against the walls. Sébastien Le Prestre de Vauban (1633-1707), considered a genius of military engineering, emerged in the age of French domination, during the reign of Louis XIV (1638-1715).

Vauban based much of his work on that of Pagan but also emphasized the use of detached bastions, claiming that their fall would not result in the loss of the entire fort. One of the best examples of Vauban's first system of fortification is the citadel of Lille, in northern France. Vauban later refined his first system with a second and a third, and an example of the latter can be seen in Neuf Brisach, built in 1699 in northeastern France. One of Vauban's contemporaries, the Dutch solider and military engineer Baron Menno van Coehoorn (1641-1704), developed a system in the Netherlands that was adapted to water defenses and was much more economical to build than were fortifications of Vauban's second and third systems. Although they designed many fortifications, Coehoorn and Vauban were masters of the siege and knew that no fortification was impregnable.

Some of the important features of the bastioned fortifications of the Vauban era included the bastion, *bonette*, *caponier*, casemate, counterguard (a ravelin with a redoubt), counterscarp, covered way, crown work, detached bastions, glacis, hornwork, *lunette*, ravelin, and *tenaille*, which were used to protect the curtain.

The new fortifications in France and some other countries also defended key ports, forming coastal defenses; others guarded mountain passes; others

still were incorporated in a loose line covering the exposed frontier. There were no solid lines of defenses, but an army of the period would have had either to eliminate these positions or to leave its lines of communications exposed. Many older fortifications still remained in service, and some played a prominent role in conflicts such as the English Civil War of 1642-1651.

The eighteenth century did not bring any major changes in fortifications design. In the mid-eighteenth century, John Muller (1699-1784) published in England *A Treatise Containing the Practical Part of Fortification* (1755), which explained the design elements of Vauban's and Coehoorn's systems, among others. French military engineer Marc-René de Montalembert (1714-1800) emphasized the use of artillery for defense of fortifications and insisted that protecting the guns in casemates was the best policy.

TURNING POINTS

c. 1480	Fortifications begin to undergo design changes, such as lower, wider walls, to accommodate the use of cannons.
c. 1530	King Henry VIII of England builds series of forts on southern coastline to guard against European invasion.
c. 1660	Sébastien Le Prestre de Vauban emerges as a genius of military engineering, designing bastioned fortifications.
1793	Circular brick Martello towers are built in Corsica, and their design is copied as far away as North America.
1880's	The French develop high-explosive artillery, rendering all existing forts obsolete.
1930's	As the building of extensive fortified lines begins, the French complete the Maginot line along eastern border of France.

NINETEENTH CENTURY TRANSITION

A transitional phase began late in the eighteenth century when the threat of French invasion lent a new importance to coastal defenses in England. Naval action against a strong tower in Corsica in 1793 led the British to create similar towers to defend their vulnerable coastline. More than one hundred of these circular brick Martello towers were completed between 1805 and 1812. With thick walls at the base and rising to a height of about 10 meters, they held an artillery piece protected by a parapet on the roof. Martello towers were also built in North America and South Africa.

Interesting innovations appeared in the first half of the nineteenth century. Walls were made slightly higher to add more positions for cannons at different levels. Some examples include the Maximilian towers built at Linz, Austria, in 1830 and later near Verona, Italy, which consisted of three floors and eleven mounted guns. The Malakov Tower of Sevastopol, Ukraine, mounted guns on two floors and the roof, and the pentagonal Fort Sumter in the harbor of Charleston, South Carolina, accommodated artillery on two floors and the roof.

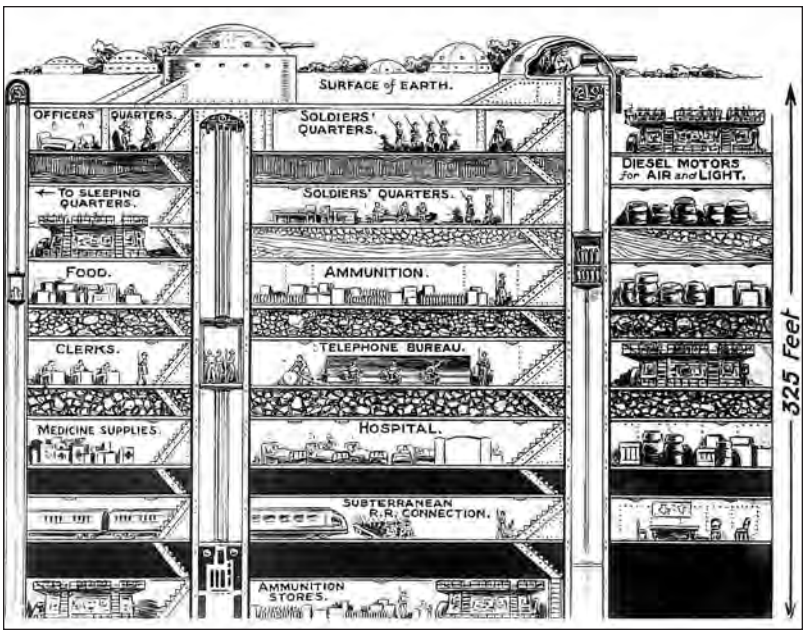
The Prussian school of fortifications adopted the earlier ideas of Montalembert, opting for a polygonal design and replacing bastions with caponiers that protected the ditches and became essential in covering the faces of the forts. The masonry forts of the nineteenth century proved inefficient in the American Civil War (1861-1865) when Forts Sumter and Pulaski proved vulnerable to rifled artillery. The Americans soon came to rely on wood and earthen forts, such as Fort Wagner in Charleston harbor, South Carolina, to withstand heavy bombardment. After the Franco-Prussian War (1870-1871) both the French and Germans also reconsidered their designs.

LATE NINETEENTH CENTURY

Raymond Adolphe Seré de Rivières (1815-1895) initiated new polygonal designs with surrounding ditches to secure France's borders, forming an almost continuous line defended by fortress girdles and barrier forts in restricted terrain. German military strategists did the same for Germany's borders, emphasizing the use of detached polygonal forts to form a fortress girdle around key cities. These forts served as artillery platforms and were located well beyond

the town's perimeter to keep modern long-range artillery out of range. By the mid-1880's, the French had developed a new high-explosive shell that rendered all existing forts obsolete. All masonry forts had to be reinforced with concrete. Many of the newly outdated German forts and exposed artillery positions were replaced with detached battery positions. Interval works were created to fill the gaps in the rings. The new forts were built with concrete instead of bricks and reinforced with armor.

Both France and Germany adopted armored galleries and turrets for their artillery in the 1870's, but it was not until the 1890's that these became the essential artillery positions of key forts. The German Gruson Works, founded in 1869 and later absorbed by Krupp, became a primary supplier of armored turrets to Germany and other countries, such as Switzerland. The French used turrets built at Saint-Chamond in southeast-central France. The new French forts also included armored observation positions and machine-gun turrets with Bourges casemates designed for flanking fire and mounting 75-millimeter guns. Belgian military engineer Henri-Alexis Brialmont (1821-1903) created a fortified ring at Antwerp, and more modern rings, with forts that included a central citadel with artillery turrets enclosed by a moat, at Namur and Liège. In the last decade of the century, the Germans created a new type of fortification called the *Feste*, which included large garrison areas and artillery blocks mounting several turreted guns. The first Feste was built at Mutzig. Several more were built around Metz and Thionville, but none saw combat until World War II. Across the border, the French continuously modernized their forts, forming fortress "girdles" at Verdun, Toul, Épinal, and Belfort. During World War I the Germans based their strategy on maintaining their defensive positions in France, going through Belgium, avoiding the French fortifications, and using their new super-heavy 420-millimeter artillery to smash the weaker Belgian forts built by Brialmont. In 1916 a change in strategy led the Germans into a disastrous campaign against the heavily defended Verdun forts, which had a telling effect on postwar considerations.



Hulton Archive/Getty Images

A sectional diagram of the Maginot line, defensive fortifications built along France's eastern border to protect against German invasion.

TWENTIETH CENTURY

In the 1930's, influenced by the Verdun experience, the French built the Maginot line, a line of defensive fortifications covering the eastern border of France. The new forts, known as *ouvrages*, reflected not only the lessons learned at Verdun but also the influence of the German Feste, now located in France. These ouvrages mounted medium artillery in turrets and casemates in individual blocks and had a subterranean service and garrison area linked to the combat area by a main gallery of up to 1 kilometer in length. The forts, with concrete roofs of up to 3.5 meters high on subterranean positions up to 30 meters deep, could resist rounds of up to 420 millimeters.

The Germans also built subterra-

nean forts on their East Wall in the 1930's, but after 1936 they created a new type of fortified line, the West Wall, which used smaller bunkers deployed in depth and protected by massive minefields. The Italians created a new line of Alpine fortifications known as the Vallo Alpino, and the Swiss created similar, smaller positions to defend their National Redoubt with only a few modern, smaller versions of Maginot-style forts on the border. The Czechs, with French assistance, created a line of fortifications to encircle their vulnerable border, one section of which included Maginot-style ouvrages. Even the Belgians built a series of new forts to defend Liège from German attack. The Soviets created the Stalin line, with numerous positions similar to those on the Swiss and Czech lines, but abandoned it in 1940 for another line that was not completed. The Finns built a line of small fortifications called the Mannerheim line, with small bunkers and obstacles, and, after its loss, built a stronger position called the Salpa line. The longest defensive line, the Atlantic Wall, was created by the Germans between 1941 and 1944. It stretched from the Spanish border along the coast through Norway. This was not a continuous line but included many "fortress zones" built around ports with smaller strongpoints. Bunkers, mines, artillery positions, and other obstacles defended possible landing sites. In addition, the Germans built special concrete positions for heavy artillery on coastal sites, huge fortified submarine pens, command posts, and shelters in the lands they occupied. Their opponents built similar positions before and during World War II, from the English coast to Gibraltar and Singapore and from the American coast to the entrance to Manila Bay.

After World War II, the heavily defended gun-bearing fortifications forming continuous defensive lines were largely abandoned in favor of smaller strongpoints and lighter border defenses. The Cold War led to a new generation of fortifications that were created largely to protect command centers, such as the U.S. Air Force command center at Cheyenne, Wyoming. Some older fortifications, such as a few Maginot ouvrages, were restored for that purpose. Underground missile silos were constructed to protect nuclear missiles. However, when conventional war broke out most armies relied upon fortified lines consisting of field fortifications, fortified strongpoints, and even trenches. Such was the case in the Korean and Vietnam Wars, and in the 1990's, when the Iraqis built defenses on the border of occupied Kuwait.

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J. E. Kaufmann

Sieges and Siege Techniques

Modern

Dates: Since c. 1500

Nature and Use

A siege is an operational method used by armies to capture heavily fortified or defended areas, including cities and castles. The process begins when the besieging force cuts off access and egress to the besieged area. The purpose of this action is to prevent resupply or reinforcement of or escape from the garrison, compelling the garrison to surrender with minimal loss to the attacking force. If the besieged force does not surrender once it is surrounded, the siege continues until the attacker gives up or storms the fortifications using its military capabilities. Against a determined defense, the latter option could result in significant casualties to one or both sides.

Development

In the early modern period, siege warfare closely resembled siege warfare of the earliest recorded times. In general, once the line of circumvallation, or wall that denied the besieged city any outside contact, was completed, the opposing forces sat and waited for one side or the other to run out of supplies. The ability to create a breach in the defenses was extremely limited, and going over the defenses was extremely costly in lives.

Cannons were used by the English during the Siege of Calais (1346-1347). The cannons of the day were direct-fire weapons with limited range and power. It was not until the Siege of Constantinople (1453) that a mortar was able to lob artillery fire over the walls and into the defenses behind them. Although these new weapons made it a little easier to breach some defenses, they did not alter the way sieges were conducted. It was not until Charles VIII (1470-1498) of France invaded Italy in 1494, with what is considered the first modern artillery train, that artillery became a significant part of siege warfare. The first major impact of this development was the change in the design of city and castle defenses from high, narrow walls to low, thick walls that were more resistant to artillery fire.

In the early part of the sixteenth century as the Turks expanded their empire throughout the Mediterranean, there were few forces standing in their way. By 1565 the only obstacle to complete Turkish domination of the region was the fortress of the Knights Hospitallers on the island of Malta. This fortress was commanded by Jean Parisot La Valette (1494-1568), whose strenuous defense, coupled with timely help from outside forces, prevented the Turks from seizing the fortress and blocked the westward expansion of the Ottoman Empire.

Gradually, over time, the art of fortification developed beyond the capacity of attacking forces to overcome. Many books were written on the subject, the first by the Italian Jacomo Castriotto (c. 1530-c. 1570) in 1564 and later by the Frenchman Blaise François, comte de Pagan (1604-1653) in 1541 and Chevalier Antoine de Ville (1596-1657) in 1625. However, no one took the time to write about capturing these great new fortifications. The weapons of the day were incapable of overcoming building technology, so sieges remained a waiting game.

The waiting game continued well into the seventeenth century. It was at Stenay (1654) where a little known French engineer, Sébastien Le Prestre de Vauban (1633-1707) first made his presence felt. Vauban succeeded in taking the fortress by siege, resulting in his becoming the king's engineer. Over the next fifty years, Vauban would revolutionize the art of siege warfare. He became the greatest military en-

gineer of his day and changed the way sieges would be fought for generations to come. In fact, his fortress at Maubeuge would stand against German assaults for nearly two weeks in 1914. It was said that there was no fortification Vauban could not take and that no fortification built by Vauban would fall. Of course, there were several occasions on which Vauban was forced to lay siege to his own work.

In his lifetime Vauban constructed more than one hundred fortified locations and conducted dozens of sieges. During this period he made two major contributions to the art of siege warfare. At the Siege of Maastricht (1673), he first employed the system that became known as "saps and parallels" to capture the city in thirteen days. The saps and parallels system would be the standard method for besieging fortresses for the next 160 years, culminating in the last of the great classical sieges, the Siege of Antwerp in 1832.

Vauban's system was simple and elegant. Once the fortress or city was cut off, a trench was dug around the target. This trench, dug at long range for cannons of the day, was called the first parallel. Once the first parallel was complete, a series of saps were dug toward the fortifications. These saps were also trenches, dug in a zigzag manner to prevent the defending force from getting a clean shot at the engineers doing the work. At approximately medium range for cannons, a second parallel that circled the enemy positions connected these saps. Along this second parallel, artillery positions were prepared, so that the attacker's cannonfire could achieve better results.

Once the supporting troops were in place, another set of saps was dug toward the enemy positions. This second set of saps was connected by a third parallel, constructed at close range for the cannons. Again, the parallel would contain artillery positions. From the third parallel the final assault would be conducted. Vauban was able to develop the system to the point where he was able to predict the time until the successful completion of the siege before it even started. The entire process was codified in his book, *De l'attaque et de la défense des places* (1737-1742; attack and defense).

The second of Vauban's innovations dealt with effective use of cannons during sieges. The cannons of the day were low-trajectory, direct-fire weapons that were used to batter away at the enemy defenses but which could do little else. It was during the Siege of Philippsburg (1688-1697) that Vauban developed the concept of ricochet fire, making the cannons more useful. He determined a method that allowed the cannonball to bounce off the fortification walls and into the area behind it, causing damage and disruption to previously protected activities. Ricochet fire remained an artillery technique until the development of the howitzer in the 1830's ended the need for it.

The seventeenth century would showcase a number of great engineers who left their mark on siege warfare. After Vauban, perhaps the second most significant was the Dutch engineer Baron Menno van Coehoorn (1641-1704). Coehoorn is known for two significant contributions to siege warfare. The first was his advocacy of the direct method of resolving sieges. He felt that one should look for shortcuts, trading lives for time if necessary, and that storming the defenses was preferable to starving the defenders. His second contribution was the Coehoorn mortar. Like other mortars, it had a short range and a high trajectory, useful for lobbing shells over

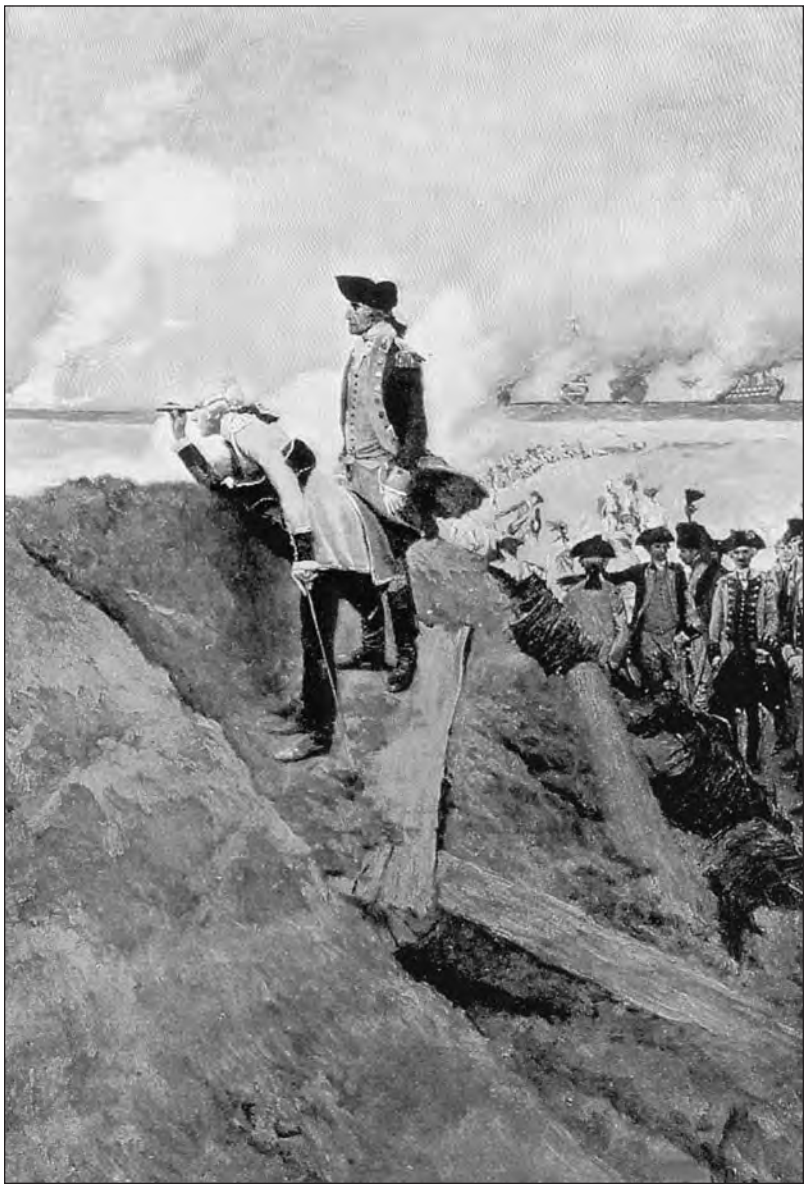
TURNING POINTS

1494	Charles VIII introduces the modern siege train.
1565	The Siege of Malta ends the Turkish advance across the Mediterranean.
1673	The use of saps and parallels is introduced by Sebastién Le Prestre de Vauban at the Siege of Maastricht.
1696	Ricochet fire is introduced by Vauban at the Siege of Philippsburg.
1781	The Siege of Yorktown ends the American War of Independence.
1832	The last of the classical sieges occurs at Antwerp.
1942	The use of aerial resupply is introduced at Stalingrad.
1968	The last major sieges of the period occur at Hue and Khe Sanh, Vietnam.

walls. The major difference was that his mortar was designed to be lightweight and easily transportable and to lob small, antipersonnel grenades with a high rate of fire. The high rate of fire would keep the enemy pinned down while his forces could storm the works.

The fortifications constructed in the French, Dutch and, later, German styles, as developed by Vauban, Coehoorn, and others during the late seventeenth and early eighteenth centuries, changed the face of warfare in Europe for the next one hundred years. During the period from 1749 to 1815 a total of 289 major sieges were conducted throughout Europe, representing more than one-third of the total major engagements during the period. Even in North America sieges played a key role; the Siege of Yorktown (1781), for example, ended the American Revolution (1775-1783).

By the middle of the nineteenth century, the science of artillery had overtaken the science of fortifications. Advancements in gunpowder technology, forging, and projectile design changed the face of siege operations. New gunpowder mixes and better metallurgy increased the range of the weapons, and rifling and shell aerodynamics improved accuracy. It was no longer necessary to dig saps and parallels close to the defenses. They could be attacked more effectively, and safely, from longer ranges. The development of the howitzer made indirect fire much more effective as well. Expensive fixed fortifications became obsolete except at large cities.



North Wind Picture Archives via AP Images

George Washington and the comte de Rochambeau at the Siege of Yorktown, which effectively ended the American Revolutionary War.

As the role of permanent fortifications declined, the value of field, or temporary, fortifications increased. The field fortification of choice was the trench. Most of the sieges over the later part of the nineteenth century involved rings of trenches on both sides, rather than those constructed by the attackers. In North America, key examples were the Sieges of Vicksburg (1863) and Petersburg (1864-1865), both during the American Civil War (1861-1865). In Europe, despite the presence of major permanent fortifi-

cations, the same was true. Both sides fought from trenches during the Siege of Paris (1870) during the Franco-Prussian War (1870-1871). This trend continued through the end of World War I. To some extent, combat across the entire western front of that war had devolved to siege warfare techniques by early 1915.

The introduction of the tank to the battlefield late in World War I began the move away from trenches and toward strongpoints. Defensive works soon became a series of individual strongpoints or fortifications, linked by fields of fire and communications lines but fighting independently. This change would also affect the way sieges were conducted. It was no longer possible to create one breach and force the defender to surrender; each strongpoint had to be dealt with individually. However, some fundamental rules still applied. The first objective of a besieging force remained the isolation of the defender from resupply and reinforcement. This was no longer done with lines of circumvallation, however, but with strongpoints and patrols. Once that had been accomplished, the attacker then sought to create weaknesses in the defense. Finally, if surrender was not obtained, storming was necessary.

Each of these steps became more difficult to make as technology advanced. As weapon lethality increased, so did troop dispersion. It became more difficult to concentrate forces to cut off the defender. Too many holes existed and small units could escape by avoiding the besieger's patrols and fixed positions. Besiegers were further hindered by the increased use of aircraft for resupply. It was no longer necessary to move through the sieges. Instead, supplies and reinforcements could be brought in over the top of the lines. There were limitations, however, as the Germans found out during World War II at Stalingrad (1942-1943). The number of aircraft sorties required to resupply the army was beyond the capability of the German air force, and eventually the surviving 91,000 men of the German Sixth Army were forced to surrender to the Russians. Similarly, in Vietnam at Dien Bien Phu (1954), the French attempted to supply their defending force by air. Although they were successful for some time, the attacking Vietnamese inflicted enough damage to the runway that flights in and out became impossible. The introduction of the helicopter diminished the need for runways and made aerial resupply more practical, but limited lift capacity was a problem. At Khe Sanh (1968) American forces were able to successfully resupply their forces in this manner and were able to break the siege.

The introduction of the atom bomb (1945) and other weapons of mass destruction have provided a possible means to overcome any strongpoint but also present tremendous risk to the entire environment. Since the late 1960's, advances in conventional weapons technology have also greatly reduced the need to conduct sieges. Precision strikes, remote imagery, and other tools make the work of assaulting defended positions so much easier that attacking armies in the most recent large-scale conflicts have not had to resort to sieges in order to clear enemy positions.

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Jacob P. Kovel

Armies and Infantry
Modern
Dates: Since c. 1500

Nature and Use

Modern infantry warfare began in the sixteenth century with the advent of the pike, which transformed the concept of the infantry. The pike was utterly useless when used alone, but when used together with hundreds of other pikes, it was harder to stop and harder to attack than was any other hand weapon. However, for thousands of pikemen to work together, they had to learn to march in time to the beat of the drum, and they had to learn to respond simultaneously and uniformly to a series of clearly understood commands. The effectiveness of the pike was utterly dependent on order, and disorder spelled disaster. The solution was drill, or marching exercises.

The Swiss, who revolutionized the employment of the pike, and were quickly copied by every other nation in Europe, had developed a system of drill that allowed for rapid movement in good order, instant changes of facing, wheeling, opening, and closing of the intervals between ranks and files and the merging of ranks and files. They had also developed a series of standard motions for individual pikemen, so that when the command was given to "Port your pike," all pikemen knew exactly what posture to assume.

Although the Swiss did not invent drill, they created a degree of emphasis and elaboration that had not been seen since the days of the Roman legions. In the sixteenth century, if one wanted to be an effective pikeman, one had to learn and practice, and then continue to practice. Every man, from front to rear, had to be a professional. Amateur militia could and did attempt to master the drill and weapons of the professionals, but they were nearly always swept aside if they got in the way of professional pikemen.

In the sixteenth century, the word "professional" was generally synonymous with "mercenary," and the armies of sixteenth century Europe were composed of mercenaries from all over Christendom. Because these mercenaries required payment, failure to pay could result in strikes, mutinies, desertions, or even outright betrayal. It could even lead to disasters such as the Sack of Rome in 1527, in which an imperial army stormed and brutally pillaged the Holy City, even though the emperor had made peace with the pope. In another disaster, known as the Spanish Fury (1576), an unpaid Spanish army that had been sent to the Netherlands to crush a revolution rekindled it by sacking the pacified city of Antwerp.

The pike alone was inadequate for battle; pikemen were at a serious disadvantage against missile weapons. At Bicocca (1522), an unsupported Swiss pike formation was shot to pieces by Spanish and imperial harquebusiers after they were stalled behind a sunken road. These same harquebusiers gave a similar treatment to the French cavalry at Pavia (1525) when they hid behind hedges to blast the armored knights from their horses.

The successes of the harquebusiers, ironically, highlighted their weakness: They were able to bring their full power to bear only when they had an obstacle between them and their targets, which kept their enemies just out of reach. Essentially, the "shot," a generic term for firearm troops, was strong where pikes were weak, and pikes were strong where the shot was weak. When combined, the pikes could defend the shot from cavalry and other pikes, while the shot could kill from a distance. When combined, these forces were formidable.

Despite its flaws, the firearm killed as had no weapon that previously had been seen on any battlefield. It smashed through armor, it crushed bone, and it tore through soft tissue. It had what modern sol-

diers call "lethality," and it behooved sixteenth century commanders to develop tactical systems that optimized its strengths and mitigated its weaknesses. Part of this strategy was combining firearms with pikes, the other was developing a firing drill as elaborate as those of the pikes.

The most common method was to arrange the shot in a formation of eight to twelve ranks. The first rank would fire and fall away to the rear of the formation to reload. The next rank would then step up and fire, followed by the next, followed by the next. The commander could time his shots to regulate the expenditure of ammunition or intensify his fire as needed. An eight-rank formation could sustain a rate of fire of one volley every five seconds. These formations could advance or retire while firing and deliver aggressive, point-blank attacks at a jog or run. They could also double their ranks to the front, thus turning eight ranks into four, and deliver a single smashing volley in the face of an enemy charge.

This formidable combination of firepower and shock effect made infantry the anchor of any battle formation. Ironically, however, the infantry's limited mobility meant that it was not usually the decisive force in battle. A common scenario would be for the infantry to plod ahead and lock its opposite numbers in prolonged "push of pike" and point-blank musketry, while the cavalry battled on the flanks. The cavalry that was victorious would then ride around the rear of the enemy infantry. Most infantry would break and run at this point, while the best soldiers, such as the Spanish *tercios* at Rocroi (1643), would form squares and patiently wait to die.

Development

For most of the sixteenth century, pikes favored extremely deep formations of as much as a hundred ranks depth. At the core of these formations would be the colors and the "double-pay men," who would issue forth through the intervals between the files to smash a stubborn enemy with halberds or two-handed swords. The shot, in massive formations, would form blocks on the wings. The advantage of such formations, often called "battles," were their tremendous staying power; there was always someone to take the place of the man who fell. Such formations could also form a 360-degree defense in seconds by facing every man to the outside. They could also provide a place of relative safety in the rear ranks, where new recruits could be seasoned. They almost certainly provided a huge morale boost, assuring each soldier that he was part of something massive and invincible. They were, however, also tremendously wasteful of manpower. The Dutch commander Maurice of Nassau (1567-1625) had to make much more frugal use of limited resources in his rebellion against the Spanish, so he developed a system where the "battles" were reduced to "battalions"

Turning Points

1503	The first effective use of the combination of firearms and pikes, a formation called the "Spanish Square," is made at the Battle of Cerignola.
1522	Spanish harquebusiers slaughter Swiss pikemen in the service of the French at the Battle of Bicocca.
1525	Spanish harquebusiers slaughter French cavalry at the Battle of Pavia, hiding behind hedges to blast the armored knights from their horses.
c. 1600	The military reforms of Maurice of Nassau reduce the size and depth of pike formations to facilitate maneuverability and increase the number of muskets in units.
1688	Sebastién Le Prestre de Vauban introduces the socket bayonet, which fits over a musket's muzzle and allows the musket to be loaded and fired with the bayonet attached.
1792-1815	French armies develop attack column formations with light infantry "screens."
1914-1918	The French develop the "fire and maneuver" system of small-unit tactics.
1939-1945	The use of tanks becomes crucial to infantry operations during World War II.

of twelve ranks depth in the pikes and eight in the shot.

The battalion formation, with pikes in the center and shot on the flanks, allowed every man to use his weapon, and provided for much greater tactical flexibility. Conversely, it meant that every man needed to pull his weight, and that there was no "safe" place to keep the less reliable men.

INFANTRY AROUND THE WORLD

The firearm spread rapidly and was adopted from Japan to Morocco. The Japanese, under the influence of the Portuguese, developed a balanced infantry force that combined harquebuses with blocks of well-drilled spearmen.

Outside Japan and western Europe, the adoption of the firearm did not bring with it a parallel adoption of pikes, a development of drill, or an improvement in the status of the infantry. In India's Mughal Empire, Persia, and Muscovy, infantry remained at best old-fashioned and at worst rabble. The cavalry was the place of honor and the key to victory. In China it was said that one should not use good iron to make a nail, nor a good man to make a soldier, emphasizing long-term strategy over tactical efficiency.

Only in the Ottoman Empire was there a large and efficient corps of professional infantry, known as the janissaries. They were armed primarily with firearms and relied on friendly cavalry and wagons to protect them from enemy cavalry. Unlike European shot, they were freely engaged in close combat and carried both swords and shields. They would deliver a close-range blast at their enemies, draw their swords, and charge. They did not employ rigid formations or precise drill. Although the Turkish janissaries were the best in the world in the fifteenth century, they generally found themselves outclassed by pike and shot formations on level ground in the sixteenth.

Interestingly, while Europe continued to develop increasingly more deadly and efficient ways of making war, the armies of the East changed little until they found themselves the objects of European imperial ambitions in the eighteenth and nineteenth centuries. They then either adapted to a European model or were conquered.

THE AGE OF THE BAYONET

The invention of the socket bayonet at the end of the seventeenth century combined with several ongoing developments to reinvent warfare for the eighteenth century. The socket bayonet, meant that a soldier could both shoot a musket and defend himself. When formed shoulder-to-shoulder, a row of bayonets did as well as a row of pikes at warding off a cavalry attack, but this same impenetrable wall of steel points could also deliver a deadly hail of lead. At the end of the seventeenth century, the shot had dominated the field, with a small contingent of pikes waiting only to chase off cavalry. With the advent of the bayonet, the pike was instantly discarded.

The simultaneous adoption of the flintlock and the later introduction of the steel ramrod also served to increase the soldier's rate of fire from one to two or even three to four shots a minute. Warfare became a process of massing one's firepower in the decisive point, delivering an effective volley, and charging home with the bayonet. With high rates of fire and universal use of muskets, formations quickly went from the eight ranks of the Dutch system to four, to three, and then to two ranks.

Drill also changed. The focus became one of making the soldier a nonthinking cog in a machine whose purpose was to march in a steady and orderly manner, close within a few yards of an enemy, deliver an orderly and smashing volley, and charge home with the bayonet—or to stand its ground against an enemy trying such an attack. Drill took on the jerky, precise, and rapid form now associated with drill teams, and soldiers were, for the first time, forced to stand absolutely still when at "attention." In fighting the natural tendency to fidget and look around, the soldier was distracted from the natural tendency to flinch and to feel fear.

In the eighteenth century, these well-drilled lines of infantry dominated military operations. Cavalry could still deliver a decisive blow, and artillery was getting more mobile and more deadly, but most battles were being settled by steadiness, discipline, and the effective use of infantry firepower.

The French Revolutionary Wars (1792-1802) and the Napoleonic Wars (1803-1815) saw one major change in the idea of infantry effectiveness. The

French revolutionary armies could not match the royal armies of Europe in drill and precision, but they could outmatch them in numbers and motivation. Although the infantry of France still learned to march in step and fire on command, their favored formations—attack columns with loosely formed "light infantry" screens—were designed to complement the idea of massing overwhelming force at the decisive point and using that force aggressively.

The Industrial Age

Following the Napoleonic Wars, infantry formations became more loose, and drill became less rigid. Attacks became less about marching mechanically into the face of the foe, and more about enthusiastic bayonet charges, supported by massed artillery. The nineteenth century conscript and reservist armies had to be more motivated by nationalism and belief in a cause than by drill and iron discipline.

The introduction of the breech-loading rifle accelerated this development when it doubled the infantryman's rate of fire, and made him capable of firing just as well, if not better, from the prone position as he did standing. The infantry line was reduced from two ranks to one, and commanders emphasized spirit and speed in the attack and rapid, accurate fire in the defense.

As formations became more loose, and men tended to seek cover, officers became concerned about losing control of men whom they could not see and who could not see them. They worried about soldiers panicking and wasting ammunition in blind firing or finding a hole and staying there.

During World War I, infantry operated in even looser formations than had been seen previously, but the Napoleonic notion of success based upon massed force and will to win remained strong. The futility of human wave assaults is well known, but it should be mentioned that if these attacks had always failed—if the combination of machine guns, barbed wire, artillery, and rifle fire had stopped the infantry dead, then they would not have been employed as they were for so long. The fatal problem was that these bayonet attacks did work or at least achieved limited success a fair amount of the time.

While casualties increased at Verdun (1916), the Somme (1916), and Vimy Ridge (1917), there were developments taking place that would point the way toward the future of the infantry. The French were developing a system for small-unit operations that involved some units providing covering fire, while others maneuvered to new firing positions, whence they would provide covering fire in their turn. They had perfected the "fire and maneuver" system that is the key to all modern small-unit infantry tactics.

The Germans formed elite corps of heavily armed and well-trained shock troops called *Sturmtruppen*, or storm troopers, who would slip forward and probe for weaknesses in the line. When they found one, they would attack with grenades and other close combat weapons to punch a hole in the enemy's trench lines. While the main body of the infantry widened the holes and eliminated strongpoints, teams of storm troopers would work their way deep into enemy territory, disrupting communications, ambushing reinforcements, and attacking supply and command centers.

The most significant development for the infantryman in World War I was not tactical but technological. The British solution to the trench warfare problem was the tank. The massive iron war machines of World War I were crude in nature, but by World War II, they had come to be the decisive force on the battlefield.

In World War II, infantry without tanks were no better off than had been the infantry in the trenches of World War I. However, if tanks without infantry encountered enemy infantry, they had to "button up" and blindly crash around until immobilized and killed by infantrymen they could not see. Therefore, by the twentieth century, tanks and infantry had developed a symbiotic relationship similar to that of the sixteenth century pikes and shot. Each needed the other to survive and win.

The twentieth century infantryman became a member of a combined arms team that balanced the strengths and weaknesses of foot soldiers, tanks, artillery, and to an increasing degree, aircraft. He also became accustomed to operating more autonomously than ever before. The modern battlefield is an alarmingly empty place. Friends and foes alike are concealed, and all are disbursed. The infantryman

National Archives

U.S. soldiers from the 289th Infantry make their way down a snowy road in Belgium in January, 1945.

can see only a few friends and can usually glimpse the enemy for only a few fleeting moments. Modern infantrymen must be able to work in small and often unconnected groups toward a common goal. Soldiers are made to understand the plan and their place in it and should be willing to continue to carry out the mission even when out of the sight of leaders. Many infantries have not met this standard, and large numbers of soldiers in any operation spend the whole time isolated and paralyzed by uncertainty, but success in modern combat depends on some significant number of soldiers continuing to carry on, despite uncertainty.

In World War II, infantrymen who had been assigned to tank formations frequently rode in armored personnel carriers that provided enough mobility to keep up with the tanks, as well as some protection. The armored personnel carrier evolved into the tanklike armored fighting vehicle (AFV), and the modern mechanized infantry commander is constantly faced with the decision of when or if to dismount his infantry. If they are dismounted too soon, they get left behind or slow down the advance; if they are dismounted too late, the tanks may be destroyed by enemy antitank weapons, incinerating the infantry in their vehicles.

At the end of the twentieth century, infantry remained central to operations in Vietnam and Korea,

and in counterinsurgency operations in Northern Ireland. In large-scale, conventional wars such as the Gulf War (1990-1991), however, infantry was primarily defined by its relationship to the armored vehicle. In modern U.S. Army parlance, an infantryman, on foot, doing what an infantryman has always done, is called a "dismount," as if to suggest that his natural place is inside an armored vehicle, and his existence as an infantryman is a temporary and transitory state of affairs.

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Walter Nelson

Cavalry
Modern
Dates: Since c. 1500

Nature and Use

Cavalry are defined as horse-riding warriors. There are at least eighty-four different species of horses in the world, and the rider always seeks to find a size of horse that matches the classification of duty. Because a trained cavalry horse and rider can be four to five times more expensive to equip and train than an infantryman, only about one-fourth of the large national armies from the sixteenth to nineteenth centuries were composed of cavalry.

The types of cavalry used since 1500 are classified as heavy, light, and medium. Heavy cavalry are large, armored men on large horses who forcefully charge into and through an enemy's line of battle or position. Light cavalry are smaller men on smaller and faster horses, whose mobility allows them to serve a variety of battle and nonbattle duties. Medium cavalry are expected to perform any of the duties of the heavy or light cavalries but are uniquely trained to dismount and use firearms as infantry. Cavalry who carry spears or lances are classified mostly as light or medium, being able to perform light nonbattle duties and to perform medium duties on the battlefield against infantry and cavalry.

Cavalry reached the height of its use and development during the Napoleonic Wars (1803-1815). In large European armies, cuirassiers who wore upper body armor and metal helmets were the most common heavy cavalry; dragoons were the most common medium cavalry; and a variety of riders, including hussars, lancers, cossacks, and chasseurs, formed the light cavalry. Heavy and medium cavalry could be expected to advance against infantry, cavalry, and artillery, whereas light cavalry typically fought other cavalry, artillery positions, and smaller groups of infantry. The light cavalry's mobility suited them for a variety of noncombat duties, including observing or searching for the enemy, carrying and intercepting messages, escorting officers and dignitaries, protecting or plundering supplies and equipment, and gathering food and supplies from local settlements.

A horse was mature enough for cavalry duty at about age four, was at the height of its power by age nine, and was useful until age eighteen. On the march at about 4 miles per hour, 20 to 25 miles per day was a horse's reasonable limit. A military cavalry horse was trained to the sights and noises of the battlefield; therefore, training exercises might include mock battles with drumbeats, gunshots, artillery, waving colors, and drills in crossing and jumping obstacles without hesitation.

During battle, cavalry were typically positioned on the flanks of the line to protect the sides and rear of infantry and to be located outside the infantry and artillery lines of fire. Cavalry formations also were positioned behind infantry to stop deserters, to reinforce weak sectors of the battle line, and to wait for the proper moment to deliver the final thrust to finish a weak or shaken enemy. If the battle was won, the light cavalry was used to pursue a retreating enemy and capture prisoners.

Development

The sixteenth century is significant in the development of cavalry warfare; technical and strategic advances in weaponry and the formalization of full-time national professional armies took place during that time. Gunpowder weapons such as muskets, pistols, and artillery could penetrate a knight's armor and could kill from beyond the reach of swords, axes,

R. S. Peale and J. A. Hill

Friedrich Wilhelm von Seydlitz leads the decisive cavalry charge at the Battle of Rossbach (1757) during the Seven Years' War.

or spears. Significant increases in population, commerce, and trade enabled political leaders to build large national treasuries from taxes and to pay, train, and equip professional armies and officers. The French Wars of Religion (1562-1598), the Thirty Years' War (1618-1648), and the English Civil War (1642-1651) resulted in the development and sharing of new skills, tactics, weapons, and equipment.

The Hundred Years' War (1337-1453) influenced the decline of the armored knight. The English longbows and steel-tipped arrows used in that conflict could penetrate the heavy armor of French knights from 100 yards and could be shot four to five times per minute. This scenario repeated itself at the Battles of Crécy (1346), Poitiers (1356), and Agincourt (1415). French advances in artillery technology and use was a factor in their eventually driving the British out of France.

Steel-tipped arrows and the longbow were made obsolete by the development and use of the harquebus, which was the first primitive form of musket firearm. The development of artillery also contributed to the decline of the bow and arrow, and mounted archers had disappeared by the mid-1500's. In addition to swords, cavalry were armed with a shorter version of the harquebus and two or more pistols.

During the French Wars of Religion, a new tactic called the caracole was used by cavalry in battle.

TURNING POINTS

1415	English archers and infantry inflict a major defeat upon mounted French knights at the Battle of Agincourt, initiating the decline of the heavily armored cavalry knight.
c. 1500	The development of gunpowder muskets, pistols, and cannons forces tactical and strategic changes in the use of spears, bows and arrows, swords, cavalry, and armor.
mid-1500's	European cavalries begin to appear armed with short muskets that can be fired from both mounted and dismounted positions.
1642-1649	During the English Civil War, the Royalist Army is the first to use horse artillery in the form of a small brass cannon mounted onto a horse-drawn cart.
1712-1786	Frederick the Great of Prussia is the first to use Jägers, or "huntsmen," expert mounted marksmen.
1804-1815	French emperor Napoleon Bonaparte develops his cavalry to the height of its quantity and quality, making it as significant as infantry in the outcomes of battles and campaigns.
1854-1871	Cavalry comprises a significant portion of the armies of late nineteenth century wars, but unacceptably high casualty rates occur against large bodies of infantry. The only significant successes of cavalry in these wars are when cavalry fight cavalry, dismounted as dragoons, and when performing light-horse nonbattle duties.
1914-1918	The World War I armies form large cavalry components, which are converted into infantry as the war evolves into stagnant trench warfare and high casualty rates occur.

Cavalry were tightly formed several lines deep, and each line in turn would ride to within ten paces of the enemy, fire their pistols, and quickly wheel away to reload in the rear, while the next rank rode forward to shoot. The harquebus and pistol were more accurate if fired while dismounted, but in close-contact fighting the pistol was light and left the cavalryman's other hand free to control the horse. If a cavalryman shot his pistol and had no opportunity to reload, he would then use his sword to attack and defend. One tactical use of the sword was to cut the reins of enemy cavalry so they would lose control of their horses. Due to the possibility of misfiring, each cavalryman carried several loaded pistols and a sword into battle. At this time horse armor disappeared, and the cavalry soldiers reduced their own armor, adopting a body armor called a cuirass.

King Gustavus II Adolphus of Sweden (1594-1632), whose armies were very successful in the Thirty Years' War, is recognized by military historians as the first expert to develop and use modern concepts of technology, logistics, strategy, and tactics on the battlefield. He spent half of Sweden's national budget on the army and formalized the processes of payment, clothing, supplying, feeding, and medical care for his soldiers. He increased the power of his army through the use of conscription, mercenaries, and a system of training and discipline reminiscent of that of the ancient Roman legions. He also directed his technological experts to significantly improve the effectiveness and reliability of pistols, muskets, and lighter mobile cannon.

Gustavus is also credited as the first military leader since Alexander the Great (356-323 B.C.E.) to use tactical flexibility in the training and organization of his army and its usage on the battlefield. His army had various types of infantry and cavalry, which were given specific tactical duties and then trained as disciplined masters of those duties. Relative to the large masses of enemy formations, Gustavus used smaller units strategically spaced so that they could quickly and aggressively respond to the opportunities of a battle.

Gustavus also revolutionized the use of firearms in battle. In recognition of the fact that firearms such as the pistol and musket were inaccurate, unreliable, and time-consuming to reload, Gustavus forbade the use of the caracole and decided that cavalry would attack quickly, in large numbers, primarily with swords. He trained his cavalry to attack in three lines. The first line would fire a pistol volley, then all three

lines would charge with the sword. The pistol was used only during the ensuing close-contact melee fight. Each regiment of his cavalry was supported in its attack by medium, musket-armed cavalry, known as musketeers, and two light 4-pound cannons, each drawn by one horse or three men.

A regiment in the Swedish cavalry of 1620 consisted of about one thousand men divided into eight squadrons; each squadron had a support staff of ten or more individuals who served as quartermaster, muster clerk, chaplain, provost, barber, medical orderly, ferrier, and trumpeter. By the 1630's, to increase maneuverability, a regiment was reduced to 560 men in eight squadrons. At the Battle of Breitenfeld (1631), 10,000 Swedish cavalry clashed with 16,000 Imperial cavalry with great success, and light Swedish cavalry pursued the beaten foe for four days afterward.

During the Thirty Years' War the grenadier cavalry made its first appearance in the French army. Grenadiers were a few brave select men chosen from musketeer units to attack enemy fortifications in small groups using hand bombs, or grenades. Grenadiers wore a different type of headgear called a *colpack*, which allowed them to sling their muskets over their heads onto their backs, freeing both hands to light the grenade fuse and throw it. In some parts of Europe, colpacks became more elaborate, resembling a bishop's miter.

Historians believe that during the English Civil War, Prince Rupert (1619-1682) of the king's Royalist army was the first to have his cavalry use mobile horse artillery. Called a "galloping gun," it was a small brass cannon mounted on a horse-drawn cart. The gunners accompanied the cart on horseback. A cavalry regiment serving the king's Royalist army consisted of three hundred to five hundred men organized into six troops. Historians agree that the cavalry, who fought mostly from a dismounted position, decided the Battles of Marston Moor (1644) and Naseby (1645).

In the army of the French king Louis XIV (1638-1715), a French cavalry regiment varied in size from 300 to 450 men and formed 20 to 30 percent of the army. Louis XIV had four types of horsemen: the Household Cavalry, who were the smartly uniformed chosen elite used during special ceremonies and for royal escorts; the armored heavy cavalry, known as cuirassiers; the medium foot cavalry, known as carabineers and dragoons, so called for their carbine or dragon musket weapons; and the line cavalry, lighter, more mobile lancers, hussars, and mercenary Russian cossacks.

Frederick the Great (1712-1786) of Prussia is credited with the first use of a select group of expert, mounted shooters or marksmen, called *Jägers*, or "huntsmen." These huntsmen were typically from the rural countryside and had developed expert skills in riding, shooting, and the hunting of select targets. Frederick is credited also with increasing the number of light cavalry and giving some of them the task of military policing and preventing desertion. Frederick's forces used horse artillery in greater numbers than had been used previously. A horse artillery team consisted of three drivers on six horses pulling the cannon, and eight gunners, who accompanied on horseback. By 1786 Frederick's total

F. R. Niglutsch

Russia's Cossack Imperial Guard advance into Turkey in 1877 during the Third Russo-Turkish War.

horse artillery consisted of six troops of nine cannons each.

Cavalry warfare reached its historical peak during the reign of Napoleon Bonaparte (1769-1821), military commander and later emperor of France. Under Napoleon's great cavalry leaders, Antoine Charles Lasalle (1775-1809), Joachim Murat (1767-1815), and François Christophe Kellermann (1735-1820), the French cavalry of the era became known for its aggressive audacity on the battlefield and its flamboyant lifestyle off it.

In 1805 Napoleon created a Cavalry Reserve Corps of 22,000 men commanded by Marshal Murat. However, during battle, this corps was under the direct control of Napoleon himself. In that first organization, the Cavalry Reserve had two heavy divisions consisting primarily of cuirassiers and five medium divisions consisting of dragoons. The individual infantry corps was assigned the use of light cavalry regiments.

An important component of the Cavalry Reserve Corps was the Imperial Guard regiments, whose soldiers were promoted to that elite status based on proven experience, bravery, and loyalty to Napoleon. Especially in the cavalry, Napoleon's soldiers were expected to dress according to a strict uniform code, and individual regiments even had a distinct color of horse. Napoleonic soldiers of different types wore uniforms of various colors to make themselves distinct on both parade grounds and battlefields.

Cavalry made up approximately one-fourth of an army during the Napoleonic era, and the largest numbers of cavalry in battle were at Eckmühl (1809) and Borodino (1812). At Eylau in 1807, Marshal Murat led eighty squadrons of French cavalry in a massive column charge against the Russian center of infantry, thereby saving the French from defeat. The confrontation took place on a cold, snowy day, the low temperatures allowing the French cavalry to gain an irresistible speed over the frozen ground and causing the Russian muskets to misfire.

Napoleon's army was defeated at the Battle of Leipzig in 1813 by a large allied force that included 60,000 cavalry. Because the allies had their cavalry assigned to the direct control of various infantry corps, there was no effective pursuit of the French, thus allowing them to reorganize. By contrast, after the French victory over the Prussians at Jena in 1806, Murat's light cavalry pursued the beaten foe 22 miles per day for several weeks.

During Napoleon's last battle at Waterloo on June 15, 1815, his cavalry totaled 14,000 of the army's 85,000 soldiers. During the late afternoon, middle phase of the battle, five thousand to eight thousand French cavalry repeatedly charged the British and allied army under Arthur Wellesley, the duke of Wellington (1769-1852). The French cavalry were slowed by the muddy ground and were resisted by the bayonets of Wellington's infantry, which was securely formed in twenty large square formations, four to six lines deep. The approaching French cavalry were blasted by British artillery fire and, when the French became disarrayed between the squares, were countercharged by British cavalry. Toward the end of the battle, the British and Prussian light cavalry successfully drove the defeated French army from the field, and the Prussians pursued the French for several days back to France.

After the Napoleonic Wars cavalry remained a sizable portion of most national armies. In the wars that followed, cavalry were slaughtered when they charged firmly placed infantry and artillery. During the Crimean War (1853-1856) the disciplined rifle fire from the "Thin Red Line" of the Ninety-third Scottish Highlanders turned away a large body of charging Russian cavalry at Balaklava on October 25, 1854. Later that day the Heavy Brigade of the British cavalry was successful in a charge against a larger group of Russian cavalry. At this battle the Heavy Brigade consisted of the Scots Greys, the Inniskilling squadrons, and the Fifth Dragoons squadron.

The most famous Crimean War battle was the Charge of the Light Brigade, which occurred at Balaklava on October 25, 1854, at 11:00 A.M. The British Light Brigade consisted of 673 men representing the Eighth and Eleventh Hussar Regiments, the Fourth and Thirteenth Light Dragoons, and the Seventeenth Lancers. Fitzroy James Henry Somerset, the Baron Raglan (1788-1855), the British commander, wanted the Light Brigade to retake some Turkish cannon captured by the Russians earlier in the day. Due to

mistaken orders, the Light Brigade charged a different, more heavily defended artillery position and suffered severe casualties of 113 men killed and 134 men wounded.

During the American Civil War (1861-1865), cavalry acted as medium-weight dragoons, fighting with carbines, shot guns, pistols, and sabers. Away from the battlefield they performed a multitude of light-horse duties, primarily serving as the army's "eyes and ears." In 1862 the cavalry of Confederate general Jeb Stuart (1833-1864) rode entirely around the Union army, disrupting communications and creating fear and panic among the Northern population and army alike. In 1863 the largest cavalry-versus-cavalry battles took place at Brandy Station (June 9) and at Gettysburg (July 1-3).

On July 1, at the Battle of Gettysburg, Union general John Buford's (1826-1863) dismounted cavalry held back the initial Confederate infantry attacks long enough for Federal infantry to arrive and fight a daylong delaying action. Ultimately, this delaying tactic enabled the Union infantry to consolidate a defensive position on the high ground along Cemetery Hill and Cemetery Ridge and hold back General Robert E. Lee's (1807-1870) invasion of the north. Buford's cavalry used carbine rifles from behind hastily constructed field fortifications of fence rails, rocks, and dirt. When General John Reynold's Union First Corps infantry relieved them, Buford's remaining men remounted and rode to protect the army's open left flank.

The Franco-Prussian War (1870-1871) was the last major conflict involving large forces of cavalry, and it marked the end of offensive heavy cavalry attacks. In almost every instance of cavalry charges against breech-loading rifles there were few positive results and severe casualty rates. Mars-la-Tour (1870), the largest cavalry battle of the war, included five thousand French and Prussian cuirassiers and large numbers of other cavalry types.

One innovative cavalry tactic of the war involved the Prussian high command reversing traditional policy by ordering all the cavalry ahead of the army. This resulted in a massive screen between the opposing armies, blinding the French and keeping the Prussians completely and accurately informed of every French move.

At the Battle of the Little Bighorn (1876) during the Second Sioux War, the U.S. Seventh Cavalry

North Wind Picture Archives via AP Images

A cavalry duel during the American Civil War.

Library of Congress

At the Battle of the Little Bighorn in 1876, the U.S. Seventh Cavalry was almost entirely wiped out by a superior number of Sioux.

under the leadership of George Armstrong Custer (1839-1876) was almost entirely wiped out by a superior number of Sioux and Cheyenne American natives. Custer's plan was to surprise the natives' village by dividing his force to attack from several sides at one time. Custer and most of his entire regiment were killed when the natives, on horseback and on foot, counterattacked, chased, and surrounded Custer's separate units, finishing off the soldiers, who had not been issued sabers, after their ammunition and numbers became low.

During the Spanish-American War (1898) future U.S. president Lieutenant Theodore Roosevelt was mounted when he led his First United States Cavalry Regiment "Rough Riders" in a successful charge on foot up the San Juan Heights of Cuba. The Americans suffered 20 percent casualties from Spanish and Cuban rifle, artillery, and machine-gun fire.

On September 2, 1898, at the Battle of Omdurman in the Sudan, the four hundred troopers of the British Twenty-first Lancers, which included future prime minister Lieutenant Winston Churchill (1874-1965), successfully defeated a formation of 3,000 Dervish infantry. The British charged a smaller group of Dervish visible in open ground but were surprised by a couple of thousand Dervish hidden in a depression. The British charged into the large body of Dervish infantry with lances and swords, engaged them for a short time in a close-contact melee, rode through the Dervish, dismounted, and then forced the Dervish to retreat with concentrated carbine and pistol fire. The Lancers suffered casualties of 70 men and 119 horses in that battle.

At the beginning of World War I (1914-1918) most of the European national armies initially raised large numbers of cavalry. After a short time, however, most of the cavalry were converted into infantry in response to manpower needs and the defensive

style of trench warfare. Horses were used mostly to transport supplies, equipment, and artillery. The communication and reconnaissance duties of light cavalry were taken over by the use of airplanes, zeppelins, bicycles, motorcycles, and automobiles. The most active and numerous cavalry units were Russian cossacks positioned on the eastern front of Europe. A few British Lancers and German Uhlan units on the western European front were stationed in the rear of their armies to serve light cavalry duty, prevent desertion, and as a possible rear guard in the event retreat was necessary.

Two significant cavalry actions occurred in the Middle East (Arab) sector of the war, where British and Australian forces were fighting mostly Turkish forces. On October 31, 1917, at the Gaza-Beersheba Line, the Fourth Australian Light Horse Brigade charged in loose order across an open, sandy plain and defeated two entrenched lines of Turkish infantry who used rifles and machine guns. Analysts believe that Australian horse artillery support and the audacity and speed of the charge enabled the horsemen to close faster then the Turks could lower the sights of their guns to shoot accurately.

At the Battle of Megiddo, Palestine (September 19-21, 1918), a large force of General Allenby's British and allied cavalry successfully rode around the Turkish-German flank, cut their communications, and caused much confusion as the enemy forces retreated. In several instances where the retreating forces were attempting to establish a new line of resistance, they were attacked and dispersed before they became too strong.

There were no cavalry battles during World War II (1939-1945), but there are several accounts of Polish lancer cavalry being slaughtered by German tank columns in 1939 as Hitler invaded Poland. One account describes the Polish cavalry as being falsely led to believe the German tanks were fake cardboard versions. During World War II, armored tank development permanently replaced cavalry in warfare.

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Alan P. Peterson

Naval Development
The Age of Sail
Dates: c. 1500-1850

Nature and Use

The period from 1500 to 1850 saw dramatic developments in naval warships. Although the first effective gun-armed sailing ships had appeared around 1500, these ships were little more than converted merchant ships, not designed to make the most effective use of artillery. Nonetheless, they allowed Europeans to display maritime power on a global scale for the first time, as evidenced by the creation of the Spanish and Portuguese empires in Asia and the Americas, and also in parts of Africa, in the early sixteenth century. The first type of sailing ship designed around gun armament was the galleon, which appeared in approximately 1550. Although galleons were still used by the Spanish as cargo carriers, warships became increasingly differentiated from merchant ships. By 1600 the principal missions of warships were fairly well defined: to seize command of the sea in order to facilitate or prevent invasion; to attack and defend maritime commerce; and also to attack onshore targets. These basic missions continued throughout the age of sail, and into the age of propulsion.

In the sixteenth century, galleons became the principal fighting ships. They were supported in the early seventeenth century by ships known as pinnaces, smaller vessels that were especially useful in coastal waters too shallow for galleons. Because all warships of the sailing era were constructed of wood, they were vulnerable to fire. Fireships were designed to be set on fire with the intention of crashing into enemy ships; and pinnaces often defended against fireships. Oared vessels, or vessels with auxiliary oar power, increasingly played only a supporting role to sailing ships, especially in the Mediterranean and Baltic Seas.

By the late seventeenth century, further refinements had appeared. Navies increasingly classified their warships. Ships of the highest rating came to be called ships of the line, because they were considered powerful enough to fight in the line of battle, which became the characteristic fleet tactic. Ships of lesser ratings fulfilled the roles of the pinnaces and fireships. Shore attack was not forgotten; by the 1680's vessels known as bomb ketches had been built for this purpose. The frigates, sloops, and corvettes of the eighteenth and nineteenth centuries developed from ships of these lesser rates. These smaller ships were used as the pinnaces had been, to scout for enemy fleets, to attack and defend commerce, and to

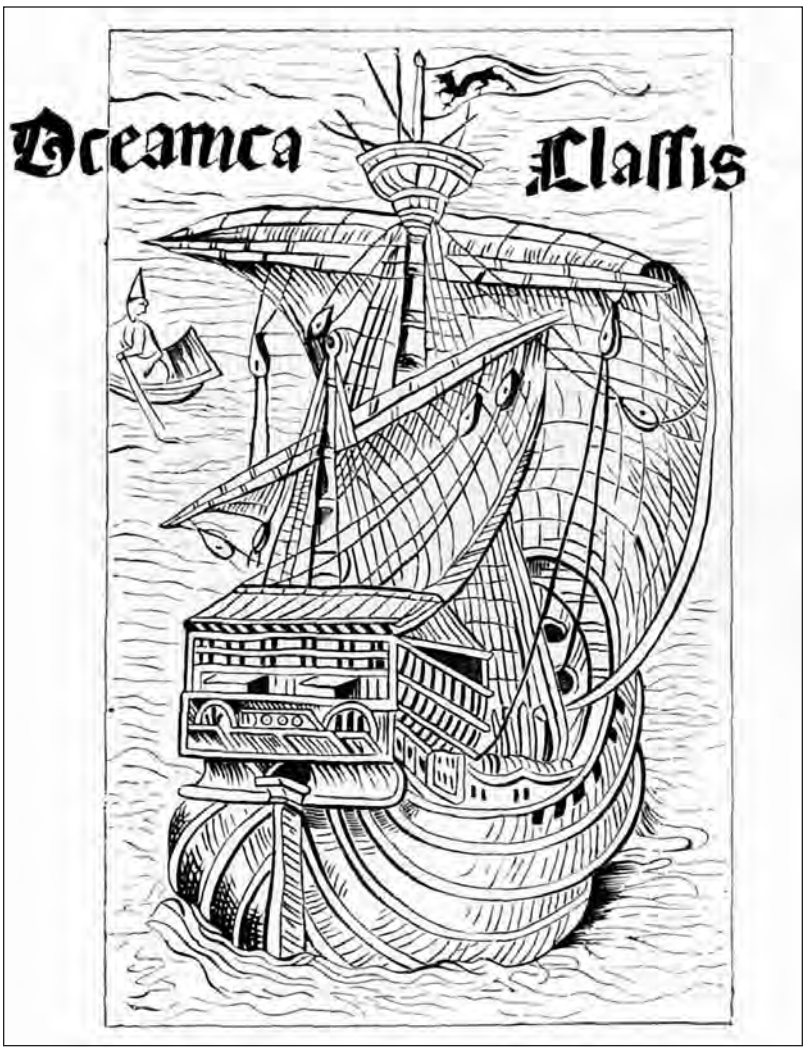
Turning Points

1501	The development of gunports allows a ship's heaviest guns to be mounted on its lowest decks, stabilizing its center of gravity.
1571	The Battle of Lepanto II, fought between the Ottoman Turks and the Christian forces of Don Juan de Austria, is the last major naval battle to be waged with galleys.
1588	The English employ galleons to individually attack the larger ships of the formidable Spanish Armada, defeating the Spanish and revolutionizing naval tactics.
1653	The line of battle, allowing for more effective use of broadside firepower, is developed.
1700-1815	Naval battles are fought by ships of the line.
1850	Most navies have converted their sailing ships to steam propulsion.

carry messages and repeat flag signals from senior commanders to subordinates.

In general, warships became more standardized and more specialized as the age of sail progressed. The distinction between warships and merchant ships became more sharply drawn, especially after the mid-seventeenth century, when the line of battle was developed. Ships grew in size, and also in number. Fleet actions were increasingly decided by shipboard artillery, leaving little scope for the boarding and hand-to-hand combat that had characterized earlier battles. Improvements in ship design, rigging, seamanship, and techniques of food preparation led to further developments in the eighteenth century. For example, large-scale fleet actions occurred in the waters of the New World as well as those of Europe. Year-round operations also became more common, whereas earlier ships had rarely gone to sea in winter. Because fleets could stay at sea longer, navies could blockade their enemies, stationing a fleet off an enemy's port and preventing its forces from leaving.

By 1800 sailing warships were providing the great naval powers, particularly England, with weapons of tremendous power, versatility, and range. However, by the end of the 1850's the tremendous technological developments in steam propulsion, iron working, and ordnance had rendered sail-powered wooden warships obsolete.



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A caravel like the one depicted here, based on a drawing attributed to Christopher Columbus, was used by explorers of Africa and Asia during the fifteenth and early sixteenth centuries.

DEVELOPMENT

ARTILLERY

One of the dominant themes in the development of sailing warships was the effort to make shipboard artillery more effective, which characterized both ship design and naval tactics. Although guns had been mounted on warships as early as the fourteenth century, they tended to be small because they had to be fitted to shoot over the bulwarks that lined the sides of the upper decks. The fitting of too many heavy guns in this manner would have endangered the stability of ships, because the guns would be placed comparatively high above the waterline. Around 1500 the major Atlantic maritime powers—England, Spain, Portugal, Scotland,

F. R. Niglutsch

Peter the Great, czar of Russia, made a trip to Western Europe, including a highly anticipated visit to Holland in the Dutch Republic to learn the art of shipbuilding.

and France—began to cut ports for guns to be fired through the sides of ships. These gunports could be closed in heavy weather, so the guns could be mounted lower in the ship with less risk of their firing affecting the balance of the ship. In turn, because they were mounted lower, guns could be heavier without endangering the ship's stability. The introduction of the gunport therefore represented an important step forward in warship firepower.

SHIP STRUCTURE

Other than strengthening the hull structure to resist the forces exerted in firing the guns, few modifications were made to early sixteenth century warships. They tended merely to be versions of existing merchant vessels, typically carracks and caravels, with high forecastles—superstructures at the bow, or front, of the ship. The high forecastles facilitated boarding attacks, the dominant form of naval action at the time. Boarding involved sending armed parties from one's own ship to attack the enemy's ship. Thus the towering forecastles acted almost as medieval siege towers. At the same time forecastles and aft castles, those in the rear of the boat, could be defended as strongholds against enemy boarders. However, because of these high forecastles, few guns could be brought to bear at the bow of the ship, which was a significant limitation. Traditionally, navies had attacked in line side-by-side, a method derived from Mediterranean galley tactics. Because galleys needed to leave room for the rowers, they could carry only heavy guns at the bow. They were thus highly effective in coastal waters, even in northern Europe, because they were able to attack "bows on," a maneuver to which the sailing ship could not effectively respond.

INTRODUCTION OF THE GALLEON

To solve the problems of gun placement, Portugal, England, Spain, and Denmark invented a new type of ship around 1550: the galleon. Galleons had a lower bow structure, like that of a galley (hence, perhaps, the name), so a heavier armament could be mounted in the bow. This proved effective at the Battle of Lepanto in 1571. The lower bow also lessened wind resistance, facilitating maneuverability. This design culminated in the so-called race-built galleons, developed by the English in the 1580's. These ships had comparatively fine lines and carried a relatively heavy gun armament. The increase in armament was important: The English navy believed it would have to rely on shipboard artillery to defeat the Spanish, their major rivals, who carried many more soldiers on their ships. In contrast the Spanish intended to use artillery mainly to weaken their opponent before boarding, which they believed was the decisive tactic. A test of these theories came in 1588, when the Spanish Armada was unable to force a boarding battle on the English fleet. Although the English had little success in sinking outright Spanish ships by gunfire, they did inflict sufficient casualties to demoralize the Spanish fleet, much of which was destroyed on its way home. The defeat of the Spanish Armada prevented Spain from invading England.

Even after the decisive defeat of the Spanish Armada, naval experts remained divided on the issue of guns versus boarding. Although wooden ships could be wrecked by gunfire, causing many casualties, they proved difficult to sink. Indeed, the English fleet nearly ran out of ammunition defeating the Spanish Armada. Therefore it is not surprising that the Dutch, the foremost naval power of the early seventeenth century, continued to advocate the importance of boarding. They used this tactic to win spectacular victories against the Spanish, such as the Battle of the Downs (1639). The Dutch, in relying so heavily on boarding tactics, may have been merely making a virtue out of necessity, initially lacking the relatively plentiful supply of artillery possessed by the English.

The bows-on attacks favored by all navies from the introduction of the galleon down to the mid-seventeenth century also limited the effectiveness of shipboard artillery. For obvious hydrodynamic reasons, a ship's hull must be longer than it is wide; but attacks with lines abreast were seen at Malta in 1565, when the Turks used ships to bombard Fort St. Elmo. In a naval battle the major use of cannons in massed formation with lines abreast was undoubtedly the Battle of Lepanto in 1571, although paintings of the battle show that some of the guns were mounted on the side for broadsides. This shift occurred because, obviously, there was more space for mounting guns along the ship's side than across either its bow or stern.

Consequently, even the galleon, with its significant forward-firing armament, mounted most of its guns along the side, or broadside. This gun placement led to the development of a turning movement that became standard in all naval tactics. The ship fired its forward guns, then turned its side toward the enemy, in order to bring its heaviest armament to bear. That motion also permitted the ship to turn away from the enemy that part of its armament which needed to be reloaded. At that time, guns could not always be withdrawn into the ship for reloading, as crews tended to be too small to push the guns back into firing position. Instead, gunners had to climb out onto the barrel to reload, a dangerous activity under fire. Turning the rearming side of the ship away from the enemy allowed reloading with greater safety. However, with each ship turning to shoot and reload at its own pace, fleet actions tended to become disorganized melees.

BROADSIDE FIREPOWER AND THE LINE OF BATTLE

It was the English, who continued to build ships of exceptional gun power, who started adopting broadsides with their turning tactic. The most notable of these was HMS *Sovereign of the Seas*, the first one-hundred-gun warship, launched in 1637 and measuring 1,500 tons—about double the size of the galleons of 1588. The English navy was the first to develop a style of fighting at sea that maximized the importance of broadside firepower. This new style was the line of battle, developed in the First Anglo-Dutch War (1652-1654) by the English navy under the joint command

of Robert Blake (1599-1657), George Monck (1608-1669), and Richard Deane (1610-1653). In the line of battle, also known as the line ahead, a fleet was arrayed in a single line of ships, one behind the other: the most effective arrangement for deploying broadside firepower. The ships in the line of battle no longer turned to reload their guns, because gun crews were larger, so that in-board loading became the rule. At the Battles of Gabbard Shoals (June 2-3, 1653) and Scheveningen (July 31, 1653), the English fleet in the line of battle won lopsided victories over the Dutch, who sought to fight in the old manner. Indeed, Dutch admiral Maarten Tromp (1598-1653) was killed in the latter battle, and the Dutch were forced to sue for peace.

By the time of the Third Anglo-Dutch War (1672-1674) the line of battle had been adopted by the major naval powers of the period, which included England, France, and the Netherlands. Only powerfully armed and constructed ships could hope to stand up to the type of punishment dealt out by the line of battle. Hence an increasingly sharp differentiation arose between those ships fit to fight in the line of battle and those that were not. This differentiation was defined by a rating system based on the number of guns a ship carried. By the 1670's, first-rates carried one hundred or more guns, second-rates carried sixty to ninety guns, and so forth. Only ships of the first four rates ranked as ships of the line. A ship required multiple decks in order to carry as many as seventy to one hundred guns; in the English and French navies first-rates always had three decks. The gun batteries became heavier, as navies increasingly used cheaper cast-iron guns instead of the more expensive, if slightly more reliable, bronze guns. The use of iron guns was another technological development pioneered by England.

The huge fleets—containing as many as one hundred ships—amassed for the great sea battles of the late seventeenth century rendered command and control nearly impossible for the admirals of the period. No matter where they placed their flagships, part of

P. F. Collier and Son

Ships of the line were considered powerful enough to fight in the line of battle, which became the characteristic fleet tactic.

their line of battle, which could stretch for 10 miles or more, would likely be out of visual range. This problem would be compounded by the vast clouds of smoke given off by black powder weapons and by atmospheric conditions such as fog. Naval commanders were also hampered by inadequate signaling systems. For all these reasons, late seventeenth century lines of battle often disintegrated into melees.

Moreover, naval tactics in the age of sail suffered from the fundamental problems associated with relying on the wind for propulsion. Winds could die down or suddenly shift direction. Furthermore, the square rig—the most common rig on Western warships—did not permit ships to sail directly into the wind. Neither was sailing highly efficient with the wind directly behind.

By the eighteenth century, fleets had become easier to control. Although navies were larger, individual fleets tended to be smaller. This paradox arose because the major navies—those of England, France, and Spain—now operated over a much larger area of the globe, using multiple fleets. Smaller fleets had less difficulty maintaining the line formation. Navies also developed better signaling techniques, involving not only signal flags but also night signaling by use of lanterns. The increasing adoption of professional officer corps by eighteenth century navies brought the line of battle under better control.

However, these very improvements in the line of battle, in some ways, worked against its decisiveness. If fleets arrayed in the line of battle were relatively equal in numbers of ships and guns, it was difficult for either side to win a clear-cut victory. Such was the case, for example, at the Battle of Málaga (1704) in the War of the Spanish Succession (1701-1714), fought between an Anglo-Dutch fleet and the French. In addition, fireships, previously an effective tool, were difficult to use against the better-controlled fleets. To regain the advantage, navies turned to the finer points of naval tactics. Much attention was paid to the relative advantages of being to windward of the enemy fleet, possessing the "wind gauge," or having the enemy fleet to windward, possessing the "lee gauge." Although it was easier to withdraw from the lee gauge, it was generally easier to shoot from the wind gauge, in part because the smoke from firing would blow away toward the enemy. However, because ships could heel, or incline, away from the wind, in severe weather, it might be dangerous to open the gunports on the lowest deck if firing from the windward.

The best way to win a victory between evenly matched forces was to take advantage of an enemy's error. This proposition is well illustrated by the Battle of Quiberon Bay (1759) during the Seven Years' War. In that battle, an English fleet under Admiral Sir Edward Hawke (1705-1781) fought a French fleet of about equal strength. The French commander, believing the weather too rough for a sea battle, decided to bring his fleet into coastal waters, where he doubted that the English would follow for fear of wrecking their ships on unfamiliar shores. However, in its haste to gain shelter, the French fleet became disordered. Hawke, seeing this, immediately attacked. In the ensuing battle, the English sank or captured seven ships, with no losses of their own. The English fleet won not only a great tactical victory but also a strategic one, because the French fleet had been intended to escort an invasion convoy.

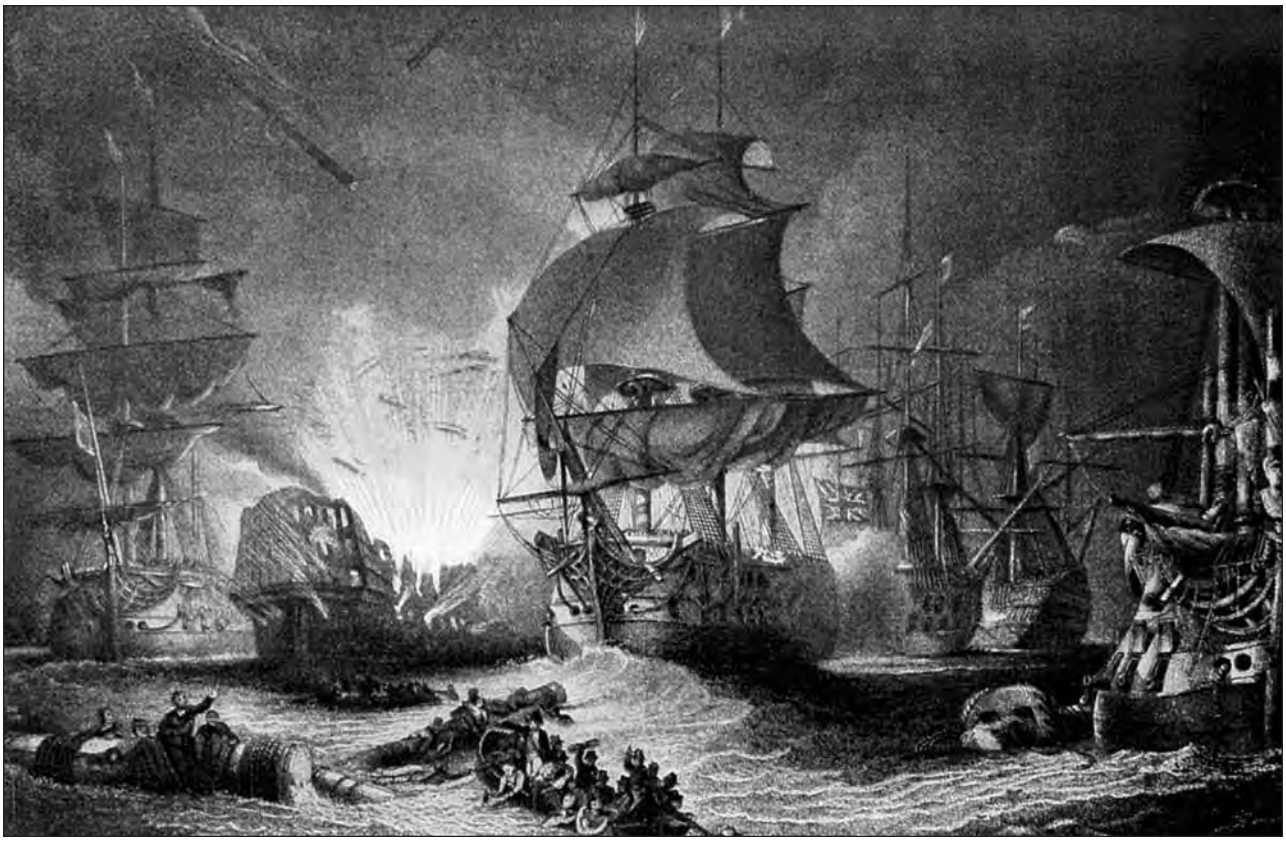
Superior proficiency in seamanship and gunnery also permitted a navy to win without possessing greater numbers. For example, England was able to win a string of victories during the French Revolutionary Wars (1792-1802) and the Napoleonic Wars (1793-1815). English sailors were more skilled, and English gun crews shot faster than all of their opponents except the Americans. Conversely, the French navy, hitherto the most formidable opponent of the English, had been weakened by the loss of experienced officers brought about as a result of the French Revolutionary Wars. The most spectacular of the English victories were those won by Admiral Horatio Nelson (1758-1805), including the Battle of Trafalgar (1805), where the English fleet of twenty-seven ships attacked in a two-column formation designed to split the Franco-Spanish fleet of thirty-three ships and force a close-quarters gunnery action. The tactic was exceedingly risky and possible only for a commander who had confidence that his men could outfight the enemy. The English won decisively, capturing nearly twenty ships, the majority of which later sank, owing to the combined effects of heavy battle

damage and bad weather. Although no English ships were lost, Nelson himself was killed during this battle, considered his greatest victory.

From 1700 to 1815 the greatest fleet actions were fought by ships of the line carrying between 60 and 131 guns with a maximum shot weight of 32 to 42 pounds, arranged on at least two decks. During this period, ships were still classed by rate. First-rates carried more than 100 guns and weighed up to 3,000 tons; they were generally used as flagships and as strong points in the line of battle. The most common line-of-battle ship came to be a two-decked, third-rate vessel of 74 guns and around 1,500 tons. This size offered the best compromise between firepower and sailing capability. Ships had become much larger: This third-rate ship was approximately the size of a first-rate of the seventeenth century.

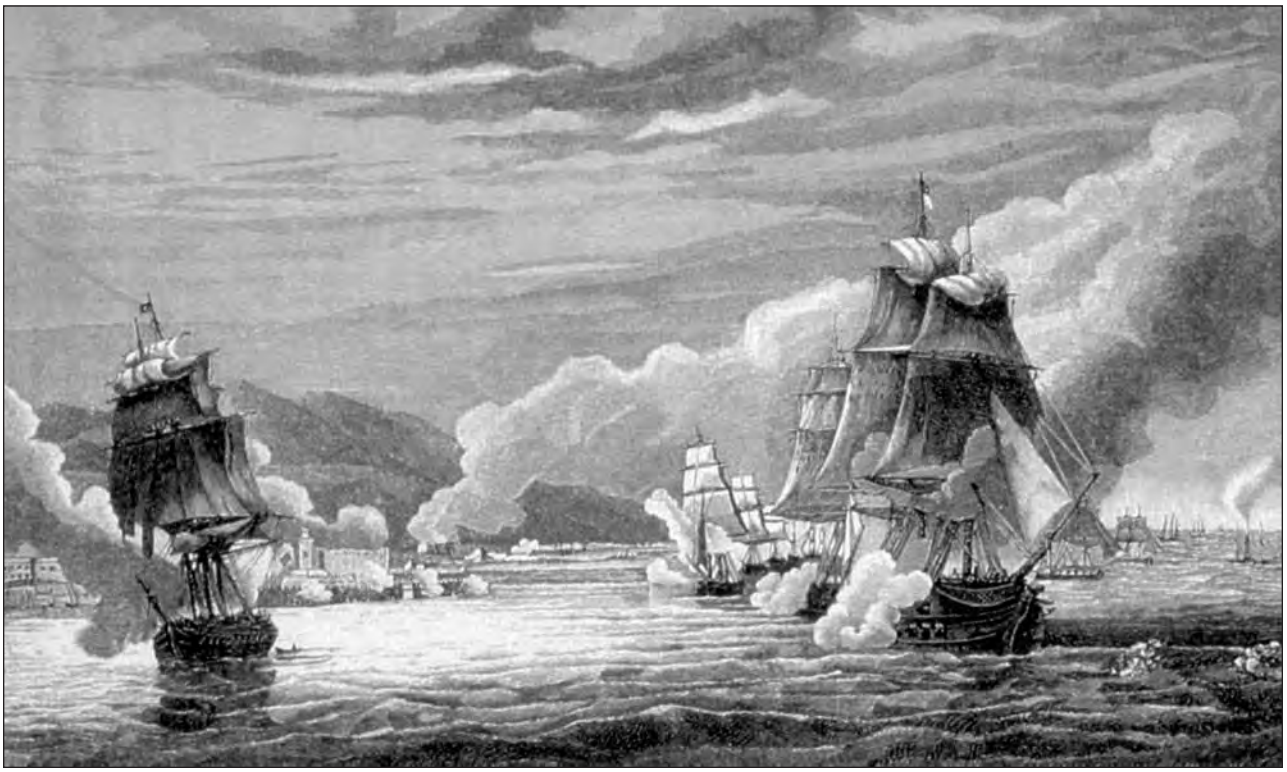
INCREASING IMPORTANCE OF FRIGATES

Whereas the ship of the line dominated fleet actions, frigates played a major role in scouting and in the attack and defense of commerce. Frigates carried between 30 and 50 guns firing 18- to 24-pound shot usually arranged on only one complete gun deck. Frigates were usually faster than ships of the line; they were also much smaller, generally less than 1,000 tons before 1780. However, by 1800, a number of navies, including that of the United States, had built very large frigates, such as the famous USS *Constitution*, launched in 1797 with 44 guns and weighing 1,500 tons. The French even cut decks off ships of the line in an effort to combine the greater resistance to gunfire and heavier guns of the ship of the line with the greater speed of the frigate. These ships were called *razées*. All navies employed smaller



F. R. Niglutsch

Admiral Horatio Nelson's brilliant naval strategy overwhelmed Napoleon's forces during the Battle of the Nile in 1798.



Library of Congress

The French bombard Algiers during a naval battle in 1830.

ships, such as sloops and corvettes, to perform roles similar to those of frigates.

Many English officers considered French ships to be better and faster than English ships. French ships did tend to be slightly larger, but they may have been more weakly built. Furthermore, the English inaugurated most of the technical innovations of the period, including the use of copper bottoms on ship's hulls, which reduced the loss of speed caused by marine growth, and carronades, thin-walled cannons that fired a heavy shot to deadly effect at short range. Both of these innovations appeared during the American Revolution (1775-1783), where they played a major role in the English victory at the Battle of Les Saintes (1782). This victory, however, in some ways came too late for the English, whose inability to maintain control of the seas earlier in the war had led directly to their failure to defeat the American colonists.

The period from 1815 to 1850 marked the swan song of the sailing warship. Wooden ships had reached unprecedented sizes, due to the system of diagonal bracing developed in 1811 by the English naval constructor Robert Seppings (1767-1840). However, the new technology of the steam engine provided the possibility of maneuver independent of the wind and conferred a decisive tactical advantage. By the 1850's most navies had converted their sailing ships to use steam propulsion, although sails were retained for cruising. Naval guns had become more destructive as well, with the introduction of explosive shells and heated cannonballs, known as "red-hot shot," beginning in the 1820's. These developments in ordnance doomed the wooden warship, which was increasingly replaced by metal-hulled and metal-armored ships in the 1860's.

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Mark S. Lacy

Naval Development
The Age of Propulsion
Dates: Since c. 1850

Nature and Use

Warships have proliferated since the 1850's, in size, number, and type. In the mid-nineteenth century, steam-powered warships replaced sailing ships as the main element of naval forces, screened by smaller frigates. The battleship emerged as iron replaced wood in the 1860's, and large-caliber guns were increasingly employed. Battleships and cruisers dominated late nineteenth century naval warfare. In the twentieth century, the development of submarines, torpedo boats, destroyers, aircraft, aircraft carriers, nuclear power, and guided weapons influenced naval warfare.

Development

Naval Technology Prior to 1850

The 1850's marked a turning point in the development of naval warfare technologies. Up until this time wood had remained the building material of choice, and most warships relied on sail power. The few steam-powered vessels in existence were propelled by fragile and vulnerable side paddle wheels. Although they improved upon sailing vessels, paddle wheel steamers had several problems. The externally mounted paddle wheels were susceptible to battle damage, and their drive machinery, high above the waterline, was vulnerable. The side paddles also took up a large portion of the side space, limiting the number of broadside weapons a vessel could carry. Also, only the portion of the paddle wheel that was in the water provided drive, wasting a large portion of the available power.

Mid-Nineteenth Century Naval Innovations

Within a decade, however, several technical developments transformed naval warfare. First, improved machinery was built to move new, propeller-driven ships. Propellers offered several advantages over paddle wheels. The propellers, below the waterline, were out of the line of direct enemy fire, as were the engines and boilers. Without large side paddles, steam-powered ships could carry additional broadside guns. In contrast to that of the partly submerged paddle wheel, all of the propeller's turning motion moved the ship.

Second, iron began to replace wood in ship construction. Iron offered additional protection against ever-increasing gun calibers while allowing the construction of larger vessels than wood permitted. The use of iron as a building material stemmed from British and French

Turning Points

1860	England launches HMS *Warrior*, its first ironclad warship.
1862	The first battle between two armored warships, the USS *Monitor* and the CSS *Virginia*, is fought in Hampton Roads.
1906	HMS *Dreadnought*, the first all-big-gun battleship, is launched at Portsmouth, England.
1923	HMS *Hermes*, the first purpose-built aircraft carrier, is commissioned.
1942	The Battle of the Coral Sea is the first naval battle fought entirely by carrier-based aircraft.
1954	The USS *Nautilus*, first nuclear-powered submarine, is commissioned.

F. R. Niglutsch

The CSS Alabama, *during a battle with the USS* Kearsage, *was sunk off the coast of Cherbourg, France, in 1864 at the height of the U.S. Civil War.*

experiments during the Crimean War (1853-1856), when both countries built floating armored batteries to bombard Russian positions. The shift from wood to iron as a construction material occurred in 1860, when the French commissioned *La Gloire*, a traditional wooden ship with an armored exterior, considered the world's first seagoing ironclad. Concerned for its naval supremacy, the British in the same year launched HMS *Warrior* and HMS *Black Prince*, frigates constructed entirely of iron, and also converted several wooden ships of the line into ironclads. A year later, the outbreak of the American Civil War (1861-1865) promoted the use of ironclads. The Confederacy utilized many ironclad ships in an attempt to break the Union blockade, beginning with the CSS *Virginia*, a casement monitor built upon the burned hulk of a Union warship. The *Virginia*'s initial success was countered by the arrival of the USS *Monitor*, the U.S. Navy's first ironclad. Fighting to a draw, the March 9, 1862, clash between the *Monitor* and the *Virginia* was the first between armored warships. Union ironclads appeared in increasing numbers throughout the war, as monitors to control southern rivers, as larger coastal ironclads, and as a single attempt at an ocean-going iron warship, the USS *New Ironsides*. The Confederacy, with limited resources, produced few ironclads but used them with good effect to block many Union naval efforts.

Capital Ships and Cruisers

Between 1865 and the end of the nineteenth century, naval warfare changed relatively little. With few naval battles to test technological developments, all the major navies followed a similar line of development. The dimensions and displacement of capital ships, or the most powerful ships in world navies, continued to grow at a generally even pace as armor grew thicker to defeat larger and larger naval guns. By the 1880's, navies generally consisted of two types of ships: capital ships, which formed the main battle line, and cruisers, which policed overseas colonial holdings. Both types of ship had generally similar characteristics. Battleships with heavy armor typically carried four main-battery guns, generally in the 10- to 13-inch caliber range, backed by a secondary battery in the 4- to 6-inch caliber range. Some battleships, particularly the early American vessels, carried an 8-inch-caliber intermediate battery. The profusion of guns resulted from a shortcoming in fire control. The only means to estimate range on the featureless ocean was to observe the splash caused when shells landed in the ocean. Because shell splashes of various calibers looked the same at long range, ships had to be relatively close before accurate shooting from the main-caliber guns could begin. At these close ranges, the smaller guns came into play. Cruisers, optimized for long range, carried only light armor and a main battery in the 5- to 6-inch caliber category. Both types of warships used increasingly complex reciprocating machinery, with steam created in boilers forced through a piston engine to turn the propeller shaft, a noisy, complex, and relatively fragile means of propulsion.

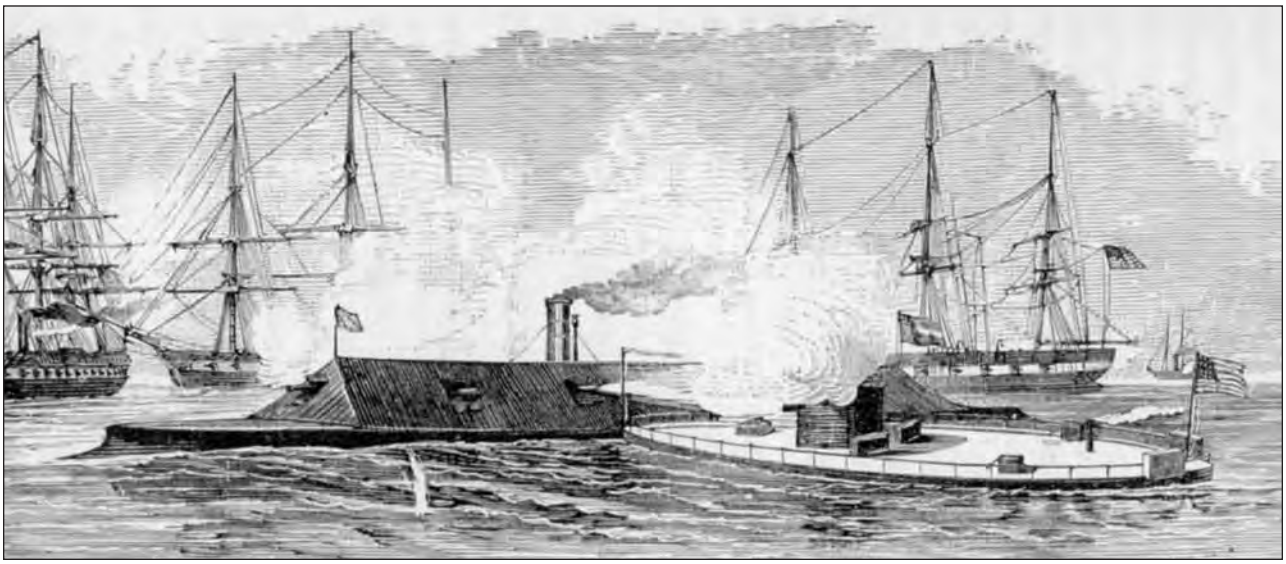
Among the major navies, only the French fol-

lowed a separate policy. Clearly unable to match England's industrial capacity, the French navy opted for a wartime strategy of *guerre de course*, or preying upon an enemy's seaborne commerce in lieu of a major fleet action. This strategy emerged from the success enjoyed by the small number of Confederate commerce raiders during the American Civil War (1861-1865). Although they were few in number, the Confederate raiders sank many Union merchant ships, drove up insurance rates, and diluted Union seapower. Unable to match the British in a building contest, the French followed the Confederate example to combat English numerical superiority. To achieve its wartime objectives, the French navy relied not on battleships but on large numbers of commerce-raiding cruisers.

LATE NINETEENTH CENTURY NAVAL INNOVATIONS

At the end of the nineteenth century, however, additional technological advances further changed warship development. The creation of advanced optical range finders vastly increased the accuracy of large-caliber guns, dramatically increasing the expected battle range. The demand for additional speed led to the adoption of turbine machinery that replaced the large piston engines with fan blades attached directly to the drive shaft, eliminating tons of machinery while increasing reliability. Although they were initially coal-fired, boilers of turn-of-the-century dreadnoughts burned fuel oil with the advantage of better fuel economy and ease of transfer. Lastly, armor plate became smaller and stronger when alloy steel, especially the carbon steel developed by the German Krupp firm, replaced wrought iron.

In a revolutionary leap in capital ship development, all of these developments were combined in HMS *Dreadnought*, launched by the British in 1906. The *Dreadnought* featured ten 12-inch guns, aimed by newly advanced rangefinders and backed only by a few light weapons. Unburdened by smaller guns, *Dreadnought* carried extensive side belt and interior deck armor. It was the first capital ship to be fitted with turbine propulsion, enjoying a significant speed advantage over its foreign rivals. In theoretical wargames, British officers believed the *Dreadnought* to be the equal of three mixed-caliber battleships. *Dreadnought* represented such a huge leap forward in technology that the ship gave its name to its own type of warship: All subsequent battleships became



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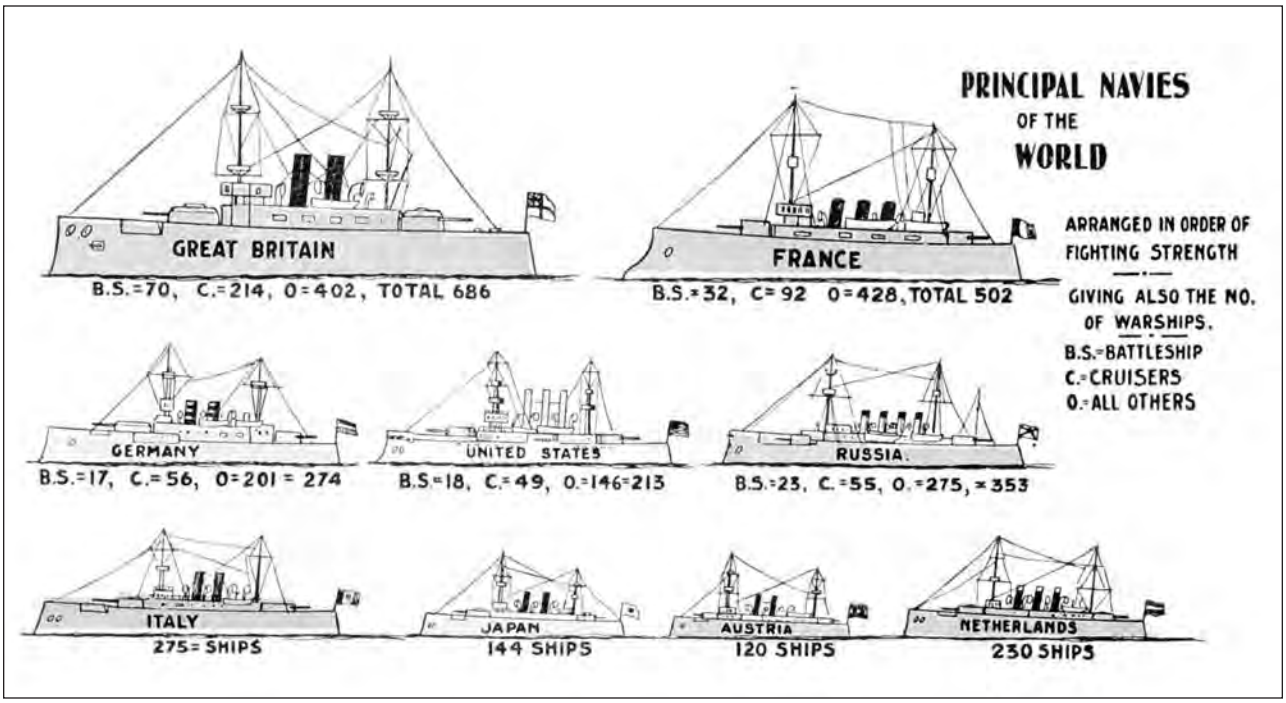
In 1862, the American Civil War witnessed the first battle of armored warships: the Union's Monitor *(right), the U.S. Navy's first ironclad, and the Confederacy's* Virginia.



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A 1902 schematic of the world's principal navies.

known as dreadnoughts, and all previous capital ships were termed pre-dreadnoughts. The firepower concentrated in these ships prompted a building spree throughout the industrialized world, as navies sought an edge in military power and national prestige in the form of dreadnought battleships. German dreadnought construction triggered a naval arms race with Great Britain that led directly to World War I (1914-1918). Even small navies, such as those of Austria-Hungary, Argentina, and Chile, emptied their national treasuries to build dreadnoughts. Technological advances also allowed for a different type of capital ship in 1907, when the British unveiled HMS *Invincible*, the first battle cruiser. Designed to operate as a reconnaissance force for the dreadnought battle fleet, battle cruisers were dreadnoughts that sacrificed armor protection for additional speed. In practice, however, a few knots of speed could not protect the battle cruisers from other capital ships, and the British lost three battle cruisers within a few hours on May 31, 1916, at the Battle of Jutland.

NAVAL WEAPONS DEVELOPMENT

At the same time that technology accelerated capital ship development, other technical breakthroughs threatened the battleship's dominance in naval warfare. Naval mines, first used in large numbers during the American Civil War, increased in explosive power and sophistication. The development of aircraft led to the use of battleships as reconnaissance platforms, with some early theorists speculating that airpower had rendered battleships obsolete. The torpedo, however, emerged as the biggest threat to the capital ship, while causing a proliferation in warship types. A single, well-placed torpedo could sink the largest battleship, and swarms of small, cheap torpedo boats threatened the existence of large battle fleets. The torpedo was even more of a threat when delivered by the submarine. First perfected in the United States, the submarine approached its target by stealth, defeating all defensive measures. Submarines also proved outstanding commerce hunters, and hundreds of British merchant ships fell victim to German submarines, the dreaded U-boats, during World

Hulton Archive/Getty Images

The British ship HMS Dreadnought in *1909.*

War I. The answer to the torpedo boat and submarine threat was the destroyer. A small, multipurpose warship, the destroyer was fast enough to hunt down and destroy torpedo boats while delivering its own torpedo attack to enemy capital ships. The destroyer's maneuverability and speed also suited it to hunt submarines.

POST-WORLD WAR I NAVAL INNOVATIONS

After World War I, naval technology expanded into wider fields, particularly after a naval limitation treaty signed at the Washington Naval Conference in 1922 restricted capital ship construction. Unable to build new battleships, the major navies applied advances in technology to update existing capital ships: converting them to fuel oil, adding exterior bulges to counter torpedoes, and mounting antiaircraft guns to ward off attacking airplanes. Although they were denied new battleships, navies faced no restrictions on other types of warships. Improved torpedoes fired from larger submarines greatly enhanced the impact of both weapons. Intended for fleet reconnaissance, the larger submarines with greater range developed into deadly commerce raiders in World War II (1939-1945). Technology also promoted the use of aircraft in naval warfare. From their origin as a reconnaissance tool, aircraft developed into offensive weapons thanks to new weapons such as the airdropped torpedo and bombs delivered by horizontal dive-bombers. The significance of naval airpower increased when several navies introduced the aircraft carrier in the 1920's. The United States, Great Britain, and Japan began with makeshift vessels such as the USS *Langley*, converted from a collier, or coalship, and progressed to larger, dedicated carrier construction, beginning with HMS *Hermes* in 1923. Carrier construction also benefited from the 1922 Washington Treaty by permitting the United States and Japan to convert battle cruisers canceled under the terms of the treaty, such as the USS *Lexington* and the *Akagi*, into aircraft carriers. These large ships, capable of carrying more than one hundred aircraft, gave the United States and Japan operational experience in large-scale carrier operations that both nations used to devastating effect in World War II.

WORLD WAR II NAVAL INNOVATIONS

Naval warfare changed dramatically in World War II, as the stresses of war pushed technology to its limit. The most significant operational change caused by the war was the shift in emphasis as the aircraft carrier replaced the battleship as the primary capital ship. The range and flexibility of aircraft, coupled with the high-profile loss of many battleships early in the war, forced the combatants to rely on carrier airpower in lieu of battleships. This is especially true in the Pacific, where fast, wide-ranging carriers, with their ability to destroy both naval targets and inland enemy positions, proved a much more useful weapon. Airpower also benefited from the American capacity to mass-produce warships. Although the Americans and British had mass-produced small antisubmarine vessels in World War I, the rapid production of all types of warships in World War II transformed the scale of naval warfare. In addition to smaller ships, American shipyards churned out

hundreds of destroyers, dozens of cruisers, and a plethora of aircraft carriers. These carriers ranged in size from the 35,000-ton Essex-class fleet carriers and the 15,000-ton Independence-class light carriers to the more than one hundred small escort carriers in the 10,000- to 12,000-ton category. In comparison, the British and Japanese produced only a fraction of America's naval output, while Germany, France, and Italy produced relatively few ships in wartime. The one exception was Germany's submarine production. The German navy's reliance on U-boats to combat British naval supremacy led to the production of approximately 1,100 submarines during the war, most of which were destroyed by the Allies. Although the primary German fleet submarine was little more advanced than its World War I counterpart, late-war U-boats contained many advanced features. These advanced submarines featured advanced hull forms for high underwater speed, advanced peroxide fuel cells, and snorkels for submerged recharging of the batteries. Fortunately for the Allies, these vessels emerged too late in the war to change its outcome.

In response to the German U-boat threat, the Allies promoted the use of electronic warfare to detect the submarines. The British development of sonar between the wars proved invaluable during World War II, as did other detection methods. High-frequency direction finding (HFDF, often called "huff duff") allowed the Allies to exploit the large amount of radio traffic needed to coordinate the massed German submarine attacks, the famous "wolf packs." The Allies were able to divert convoys away from danger areas and to attack the U-boats with antisubmarine aircraft by triangulating the wolf packs' radio transmissions to find their locations. Radar, usually associated with land-based air defense, also permitted aircraft to become potent antisubmarine weapons. Because they ranged over a much wider area than did slower surface ships, aircraft could use radar successfully, even at night, to detect and attack surfaced U-boats. The Germans attempted to counter Allied radar with a radar-detecting device known as Metox, a primitive form of electronic countermeasure that proved ineffective against more advanced British radar sets.

GUIDED WEAPONS DEVELOPMENT

The major German weapons development of World War II was guided weapons. The Germans developed the first effective acoustic homing torpedo, which guided itself to its target, a ship, by the sound the ship generated. The weapon had little influence because it proved easy to decoy, and the Allies captured an example of the weapon and soon produced their own antisubmarine version. The German-developed antiship missiles, however, had a much bigger impact. Carried into the battle area by a German bomber, the FX-1400 missile flew under command guidance to its target, with an observer in the launch aircraft maneuvering the missile via joystick controls. The weapon menaced the Allied landings at Anzio in September of 1943, damaging the British battleship HMS *Warspite* and the U.S. cruiser USS

Library of Congress

The USS Scorpion, *a nuclear submarine, surfaces at Portsmouth, England.*

Savannah. Italian battleships, steaming out to surrender to the Allies on September 9, came under attack from the missile; the battleship *Roma* was sunk, and the *Italia* was severely damaged. The Allied development of electronic jamming, however, reduced the later impact of the weapon.

NAVAL AIRCRAFT AND PERSONNEL CARRIERS

Specialized amphibious warfare ships represented the final major development during World War II. The conflict marked the first time that large-scale invasions came from the sea, and specialized landing craft emerged to carry troops onto enemy shores. The craft ranged from small personnel carriers to the utilitarian landing ship tank (LST), often referred to by their crews as "large slow target," which came directly onto the beach. The immense landing ship dock (LSD) was capable of carrying other landing craft into the invasion area. In dozens of landings in the Pacific and Europe, the Allied navies perfected their ability to mass and deliver thousands of men and tons of matériel. During the Normandy landings of June 6, 1944, D day, the Americans and British landed 100,000 men. Operation Olympic, the anticipated American invasion of Japan, envisioned the landing of more than one-half million men in the opening attack.

In the postwar era, navies struggled to incorporate many of the technological advances and weapons introduced during World War II. With the exception of the United States, the world navies relegated their battleships to the scrap yard as the aircraft carrier maintained its position as the primary capital ship. Two requirements caused a surge in the size of new American carrier construction. First, heavier jet aircraft, introduced at the end of the war, needed longer takeoff and landing spaces than wartime carriers permitted. Second, wary of losing its influence to the new U.S. Air Force, the U.S. Navy demanded larger carriers capable of accommodating large carrier-based nuclear bombers. The first of these postwar carriers emerged in 1954 when USS *Forrestal*, the first of the supercarriers, was launched. Specially designed to operate jet aircraft, with British-developed steam catapults, arresting gear, and an angled landing deck, *Forrestal* and subsequent supercarriers formed the backbone of American naval strength. The massive supercarriers, more than 1,000 feet long and displacing more than 80,000 tons, pushed the limits of fuel-oil propulsion, leading to the construction of several nuclear-powered carriers: USS *Enterprise* in the 1960's and the Nimitz class of the 1980's and 1990's. Nuclear power freed the carriers from any real speed constrictions and reduced the amount of logistic support needed by obviating the need for oilers.

Nuclear power, however, had the biggest impact on submarine construction, beginning with the first nuclear submarine, USS *Nautilus*, in 1954. Nuclear power plants permitted the construction of the first true submarines. Non-nuclear submarines are properly submersibles—vessels capable of submerging that actually spend most of their time on the surface, recharging their electrical batteries. Nuclear-powered submarines, however, can stay submerged indefinitely, limited only by crew fatigue, because water and oxygen are two of the by-products of their nuclear reactors. The postwar development of guided weapons led to two classifications of nuclear submarines. Attack submarines perform the traditional submarine missions: attacking surface ships and hunting other attack submarines. The threat of fast attack submarines became so acute, postwar surface vessels incorporated helicopter facilities into their design, as only aircraft could hope to counter the faster submarines. Ballistic-missile submarines, carrying long-range guided ballistic missiles armed with nuclear warheads, act as a last line of nuclear deterrence. The first ballistic-missile submarine, the USS *George Washington*, was commissioned in 1959. The Soviet, British, French, and Chinese navies followed suit with their own ballistic-missile submarines. One type of these submarines, the Russian Typhoon, is, at 26,000 tons displacement, the largest submarine in the world.

POSTWAR NAVAL INNOVATIONS

In the postwar era, electronic systems continued to proliferate, and modern warships were festooned with antennas and radar dishes. Contemporary warships feature electronic radar, sonar, electronic countermeasures, communications, fire control, and intel-

ligence-gathering facilities, all considered necessary for modern naval warfare. The miniaturization of electronics also led to the replacement of guns with missiles as the main naval armament in the postwar era. Antishipping missiles, with a far greater range than that of the largest battleship battery, began to replace naval guns in the 1960's. The Soviet Union in particular embraced antiship missiles fired from swarms of small attack boats and long-range bombers to counter the United States' massive naval presence. Many smaller navies acquired inexpensive antiship missiles, such as the French Exocet or the American Harpoon, to offset numerical deficiencies. For defense against this threat, warships acquired radar-guided, rapid-fire guns. In the air defense role, surface-to-air missiles replaced massed batteries of antiaircraft guns beginning in the late 1950's, when the guns could no longer defeat the fast-moving jets.

A final feature of naval development in the postwar era is the proliferation of the multipurpose ship. Due to the high cost of new technology, most navies can no longer afford specialized warships, and small, cheap, multipurpose frigates have come to form the backbone of most navies. Only major navies can afford such expensive items as aircraft carriers, amphibious warships, and dedicated antiaircraft cruisers.

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Steven J. Ramold

WESTERN WARFARE IN THE AGE OF MANEUVER

European Wars of Religion

Dates: c. 1517-1618

Political Considerations

In the sixteenth century, Europe experienced a period of civil strife, rebellions, and conflicts that came to be called the European Wars of Religion. The Protestant Reformation fueled strife between the Catholic and Protestant churches and led to changes in weapons and war across the subcontinent. Christendom divided into camps willing to fight and die for their versions of the religion. Roman Catholics, Lutherans, Calvinists, Eastern Orthodox, and members of other sects became polarized around the reformist ideas of Desiderius Erasmus (1466[?]-1536) and Martin Luther (1483-1546). Luther's 1517 publication of his Ninety-five Theses ignited the Wars of Religion. Peasant revolts along with the separation of nobility and clergy from the papacy followed. French, German, and east European territories fell into a century of civil turmoil. European political powers became embroiled in the debate even as the Renaissance, absolutism, mercantilism, and the scientific revolution changed Europe from within.

Challenges outside Europe also fueled change. The Islamic Ottoman Turks under Süleyman the Magnificent (1494/1495-1566) captured the medieval city of Constantinople in 1453, opening Europe to invasion by powerful Turkish sultans who challenged the emerging Habsburg line and Holy Roman Empire. The Eastern Orthodox Church of Constantinople was exiled to Russia as the Russian state grew across Eurasia under Ivan IV "the Terrible" (1530-1584). Early modern states struggled to emerge through political and economic consolidation amid these external pressures. Simultaneously, seafaring advances helped extend European political power across the seven seas, providing an outlet for and from the religious wars. The conquest of the Americas and the opening of trade routes into the Indian, Atlantic, and Pacific oceans led to global changes known as the Columbian Exchange, which saw both Protestant and Catholic European states emerge as international powers even as the chaotic Wars of Religion racked Europe.

Military Achievement

European states from 1517 to 1618 achieved military successes abroad but only mixed results within Europe, owing to civil conflict and the gunpowder revolution, which created equilibrium among larger states. Warfare was revolutionized, from naval and land battles to fortifications and logistics. Several of the great debates in history center on if and when Europe experienced a "Military Revolution" and what relationship any such revolution had to "the rise of the West" in global affairs.

The formation of the Catholic Spanish Habsburg Empire (1518-1648) under Charles V (1500-1558) and the rise of a number of Protestant states—including England, Sweden, and the Dutch Estates General—spread civil revolts into state conflicts. Northwestern Europe moved toward Protestantism, while Mediterranean and central Europe remained in league with the Roman Catholic Papacy. Eastern Europe, especially Russia, emerged as the new home of Eastern Orthodox Christianity. Europe became a mosaic of territories where identity was based on a blend of religious beliefs, ethnicity, and political state.

The Spanish Habsburg Empire became the most powerful in Europe as Charles V developed the first global empire with holdings on all the major continents, taking the title of Holy Roman Emperor in alliance with Catholic Europe. Charles used military and political means to control much of Europe, the Americas, and parts of coastal Africa and Asia. Conquests of the Aztec (1521) and Inca empires (1535) helped fund the Military Revolution of gunpowder in Eu-

Peeter Snayers/The Bridgeman Art Library/Getty Images

The Ottoman Turks besieged the old Habsburg capital of Vienna in 1529 and formed an alliance with France's King Francis against the Habsburgs in the 1530's and 1540's.

rope and European expansion by sea across the globe. An uneasy competition and eventual alliance (1580) with neighboring state Portugal meant the empire controlled both the best land military units in Europe (Spanish *tercios*) and the best seafarers (Portuguese mariners). However, the Spanish Habsburg Empire was obligated to suppress the Protestant Reformation, defend against the Turkish expansion, and expand globally to fund the gunpowder revolution. Bankruptcy resulted four times from 1518 to 1644. The Turkish threat, armadas against Protestant England, religious wars with Netherlands and German rebels, and conflicts in the Indian and Pacific oceans ensured the high cost of empire.

The Ottoman Turks conquered much of southeast Europe, even besieging the old Habsburg capital of Vienna in 1529 and forming an alliance with Francis I of France against the Habsburgs in the 1530's and 1540's. Turkish victories on land at Mohács (1526) and at sea at Preveza (1538) were eventually reversed as the reigns of Süleyman the Magnificent and Charles V ended. Habsburg victories included breaking the Siege of Malta in 1565 and destroying the Ottoman navy at Lepanto in 1571. By 1618, the role of the Turks in Europe was on the decline because of Habsburg military successes. However, the high cost of global empire left the Habsburgs vulnerable to other European states, such as England, France, and the Netherlands, which took over global sea trade from Spain and Portugal in the seventeenth century. In addition to military changes and religious strife, mercenaries on land and pirate privateers at sea were a large part of the chaotic sixteenth century.

Weapons, Uniforms, and Armor

The sixteenth century saw gunpowder transform weapons and warfare in Europe. Originally from Asia, gunpowder weapons were combined with European metallurgical skills, especially bell making, to create two kinds of weapons that changed warfare and thus global power. These were bronze and iron cannon (siege, ship, and field artillery cannon) and firearms (harquebus, musket, and pistol). The changes to land warfare were greatest in two areas: sieges and battles. Siege artillery and mines destroyed the medieval castle walls and led to complex star-shaped fortifications of earth, timber, and stone. Sieges became protracted affairs requiring enormous resources on both sides. On the battlefield, firearms led to professional soldier units of volley-fire infantry. Medieval land warfare had been dominated by tall stone castles, armored knights, and cavalry, spear, pike, and sword on land. In the sixteenth century these were supplanted by complex earth fortifications, pike and shot infantry, harquebuses, muskets (after 1550), pistols, giant siege cannon, and field artillery with wheeled carriages.

Uniforms moved away from armored protection made obsolete by guns toward regularized clothing units to identify specialized groups of professional soldiers. Matchlocks and wheel locks developed as firing mechanisms for firearms. Metal projectiles replaced stone, and weapons moved from breech-loaded to muzzle-loaded. Siege artillery, such as the mons meg (1449), Turkish bombards (1450), and the tsar pushka, or czar cannon (1586), weighed from fifteen to forty tons and fired five-hundred-pound metal or fifteen-hundred-pound stone shot over several miles.

The ships involved in naval warfare changed from lightweight, clinker-built (with overlapping sideboards), rowed, ram-and-board galleys with few guns to heavy-timber (often oak) sailing ships, carvel-built (with flush sideboards for strength), bristling with gunpowder weapons, side gun ports, and complex rigging. Under Henry VIII (1491-1547), English warships such as the enormous *Mary Rose* and *Great Henry* were built with skeletons of keel and ribs and could hold up to two hundred gunpowder weapons and 400 crew. The man-of-war, the first purpose-built warship for fleet duty, by 1540 carried 200 sailors, 185 soldiers, 30 gunners, powder boys, several pilots and cartographers, and a captain. Cannon included fifty-pound cannon, thirty-two-pound demicannon, long-range culverin of small poundage, and many antipersonnel hand cannon, such as demiculverins, sakers, falcons,

Catholic and Protestant Territories, 1590-1598

and robinets. The gun carriage, consisting of wooden side brackets, trunnions, and transoms, held the gun through recoil. By 1550 the English had sixteen naval cannon sizes, the Spanish twelve, and the French six. Shot could be canister, grape, chain, double, exploding, or even heated, depending on the situation. Powder was refined from the ground powder of land siege cannon to a "corned" variety of coarse grain that allowed for uniform firing across a broadside volley.

MILITARY ORGANIZATION

In sixteenth century Europe, the Wars of Religion and the emergence of gunpowder weapons disrupted state development and the ability of rulers to field large-scale, well-organized military units. Funding and loyalty were the two main variables to be overcome, thus mercenaries hired by private contractors on behalf of states formed the bulk of all military systems during war. Armies rarely exceeded thirty thousand, and naval forces usually consisted of small flotillas, with exceptions at Lepanto in 1571 and the Armada of 1588. Ethnic groups became associated with particular weapons and military units, such as English (Welsh) longbowmen, Swish and German pikemen, Spanish sword and bucklers or harquebusiers, and French heavy cavalry and musketeers. Sir Francis Drake (c. 1540-1596) was perhaps the best-known maritime mercenary, hired as a privateer by Queen Elizabeth I (1533-1603), or, as King Philip II of Spain (1527-1598) labeled him, a pirate.

Frederick Ungar Publishing Co.

An engraving of the St. Bartholomew's Day Massacre of 1572, in which Huguenot leaders and thousands of other Protestants were killed by French Catholic nobles in Paris.

Maurice of Nassau (1567-1625), as well as his brother and cousin, moved the Dutch forces toward permanent mercenary units by providing year-round training and state pensions as part of the Dutch Protestant revolt against the Spanish Empire. However, it was the advent of the printing press that led to the popularization of such ideas as manuals on military changes, from the infantry training system to projectile ballistics, spread throughout Europe. Scientific specialists such as artillery and siege engineers like Leonardo da Vinci (1452-1519), aristocrats turned officers and leaders such as Maurice's cousin John, and merchants turned sea commanders such as Ferdinand Magellan (c. 1480-1521) organized their troops and sailors around ethnic and religious companies and brigades that varied greatly in size and loyalty, owing primarily to the disruptions of the Wars of Religion.

Unit clothing and constant fighting did identify professional mercenary groups, but irregular state funding and loyalty issues often resulted in confusing conflicts and fluctuating levels of military organization. The main exceptions were the Spanish square tercio, or regiment of 3,000 regionally recruited men, and the Dutch linear battalion of 550 musketeers. On warships, powder boys of ten to fourteen years old became crucial, but their numbers varied largely depending on recruitment tactics, some of which resulted in near slavery for these boys. Pilots and ship's captains were often chosen for their expertise on particular regions or types of expeditions, but it was not uncommon to find Portuguese pilots on a Dutch ship captained by an Englishman with sailors recruited from around the globe, especially if it was a pirate ship.

Doctrine, Strategy, and Tactics

Niccolò Machiavelli, in his influential work *Il principe* (1532; *The Prince*, 1640), argues that the first work of rulers is war and that "there is no wall, whatever its thickness that artillery will not destroy." Employing the gunpowder revolution in military systems thus became a major doctrine informing the strategy and tactics of religious, state, and dynastic powers. Religious doctrine could affect the use of guns (sometimes labeled the devil's weapon). Dynastic rivals among Habsburgs, Tudors, Valois, Osmans, and Bourbons often struggled to fund the Military Revolution while building states, so the economic doctrine of creating wealth became key. Turkish, Russian, and Spanish Habsburg gains on land and Portuguese, Dutch, and English gains at sea often came as internal turmoil racked rival states in France, Hungary, the Italian peninsula, or Poland, thus indicating that opportunism was perhaps the most successful doctrine.

Strategy and tactics were transformed in the sixteenth century by the emergence of gunpowder weapons and large sailing ships. Strategy became dominated by expensive siege warfare on land and control of lucrative global sea trade. Armies lived off the land and the work of peasants, who were often unpaid, leading to revolt, mutiny, and worse. Tactically, pike and shot dominated, and musketeers (after 1550) became as common as pikemen in the seventeenth century. Training manuals and drill made it easy, inexpensive, and fast to train peasants into sailors, pikemen, or volley-fire infantry. Expensive cavalry adopted the tactic of *caracol*, or riding forward and firing pistols en masse before wheeling in reverse, but this was ineffective and their numbers declined. Steady rates of infantry volley fire were achieved by the Dutch using the "countermarch" system of six to twelve lines of infantry. After the soldiers in the first line fired, they would retreat to the rear to go through the complex reloading process.

At sea, the expense of naval seafaring again was key. The Portuguese alone had a variety of ships, including *naus*, *caravels*, *gales*, and *bergantim*. All served as both merchant ships and warships. Only the English man-of-war was utilized mainly for war fleet activity. The Portuguese caravel, English man-of-war, and Spanish galleon led to these nations' domination of naval battles abroad but to stalemates at home. The Habsburg Holy League owed its victory over the Turkish Empire at the naval Battle of Lepanto in 1571 (in which more than 100,000 men were involved) mainly to gunpowder weapons, while the defeat of the Spanish Armada of 1588 owed more to storms than to gunpowder. Europe thus remained deadlocked into the seventeenth century at home but was expanding successfully abroad.

CONTEMPORARY SOURCES

The popularization of the European printing press in the sixteenth century meant that works on militarism and religion became widely influential in Europe. Christians became polarized around the ideas of moderate reformer Desiderius Erasmus, whose works accounted for 20 percent of all print sales by 1530. Erasmus was in communication with most European scholars of the period, and his five editions of critical analysis and discussion of language translation issues concerning the Bible were most influential. The third and fourth editions of his *Testamentum* (1527; *The Essential Erasmus*, 1964) relied on Hebrew, Greek, Latin Vulgate, and his own Latin texts in parallel columns. Erasmus also produced works on the role of princes and Christian soldiers of the time. Martin Luther, with his publication of the Ninety-five Theses (originally known as the "Disputation of Martin Luther on the Power and Efficacy of Indulgences") in 1517, spurred on the Reformation in local languages. In the influential work *The Prince*, Machiavelli discusses leadership strategy in the early modern world, and he also produced works on war. Jacob de Gheyn II's book of engraved prints *The Exercise of Armes* (1607) was a military drill book that could be used to train peasants in volley firearm tactics regardless of their language.

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Christopher Howell

The Era of Gustavus Adolphus

Dates: 1609-1697

Political Considerations

Religious division, dynastic ambition, and national rivalry were all parts of the political context of warfare in the seventeenth century. These factors overlapped, often in complex ways. For example, the Thirty Years' War (1618-1648) began as a revolt by Protestant Czechs against the German Catholic Habsburg Dynasty. Later, France and Spain, the two leading European powers, joined the war on opposite sides. Although both countries were ruled by Catholic dynasties, the Bourbons and the Spanish branch of the Habsburg family, respectively, they and their ruling houses were also vying for European hegemony.

As religious passions cooled after 1630, national rivalry moved to the forefront. Whereas European princes in the sixteenth century had looked upon war as a private affair, they now increasingly viewed it as a public affair involving the whole state. This change in attitude led to higher military spending, not only for wartime expenditures but also for the funding of large peacetime military establishments, which appeared for the first time since the fall of the Roman Empire. Thus, a new political attitude toward war does much to explain how European military burdens rose dramatically in a century of generally low or even stagnant economic growth.

In the Netherlands and England, higher military spending and standing armies came at the price of granting political control to representative institutions. More commonly, enhancing the political power of the monarch seemed the best way to promote the strength and stability of the state. Strong monarchies of this sort became known as absolute monarchies, and the seventeenth century is known as the Age of Absolutism. It must be remembered, however, that the federal republic of the Netherlands set the pattern for large peacetime militaries later copied by the absolutist states.

Military Achievement

The Netherlands forced Spain to grant a truce in 1609, which tacitly recognized Dutch independence

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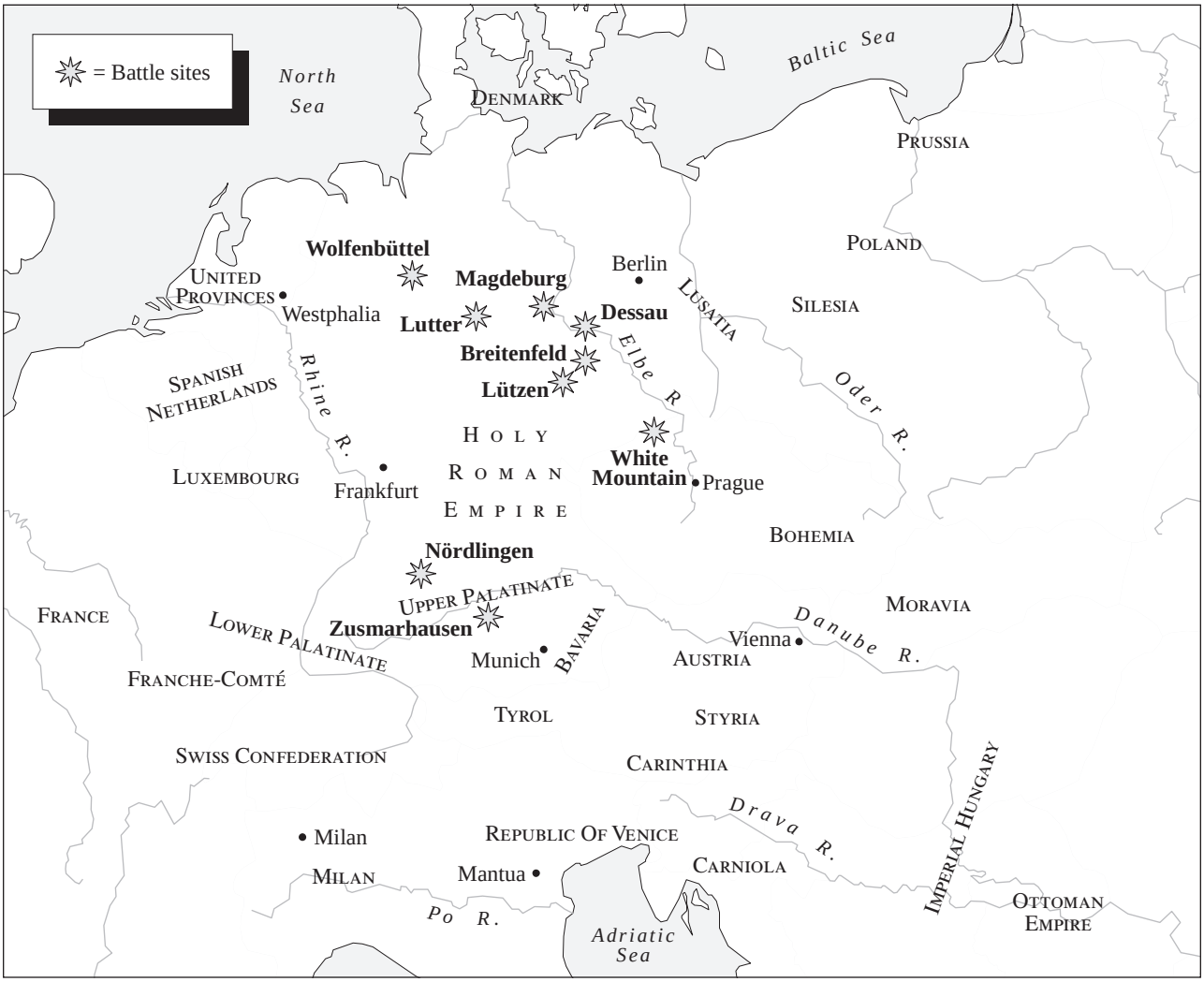
Gustavus II Adolphus is mortally wounded in battle at Lützen in 1632.

THE THIRTY YEARS' WAR: BATTLE SITES



after over thirty years of revolution of Dutch Protestant provinces against Spanish occupation. The ability of the tiny Dutch republic, with a population of only 1.5 million, to fight to a standstill what was then the strongest military power in Europe represents one of the greatest military achievements of the century. The Dutch army, commanded by Maurice of Nassau (1567-1625), became the wonder of Europe.

The Swedish king Gustavus II Adolphus (1594-1632), who ruled an even less populous and much poorer country than the Netherlands, copied and improved upon the Dutch model. By defeating the hitherto unbeaten Catholic armies of Bavaria (Battle of Breitenfeld, 1631) and the Austrian Habsburgs (Battle of Lützen, 1632) during the Thirty Years' War, he established Sweden as one of the greatest military powers in Europe, a position the nation would hold until its defeat by the Russian army at Poltava in 1709. Furthermore, Sweden replaced the Netherlands as the military model for Europe.

France, the most populous and wealthiest country in Europe, proved to be a military underperformer in the first part of the century due to aristocratic and religious factionalism. Matters began to improve only in

the 1630's and 1640's, thanks to the efforts of the statesman Armand-Jean du Plessis, cardinal et duc de Richelieu (1585-1642) and commanders such as Louis I de Bourbon, prince de Condé (1621-1686), known as the Great Condé, whose victory over the main Spanish army at the Battle of Rocroi (1643) marked the end of Spanish claims to European hegemony. However, it was not until after 1660, when French king Louis XIV (1638-1715) consolidated absolute monarchy, that the French army became the most powerful and admired in Europe. By the 1680's, France had also amassed the largest navy in Europe. French military and naval ascendancy, coupled with Louis's aggressive use of his military forces, stimulated the formation of powerful military coalitions led by England, the Netherlands, and Austria, which fought France to a standstill in the War of the Grand Alliance (1688-1697) and again in the War of the Spanish Succession (1701-1714).

These wars also established England as the principal rival to France. The foundations of England's naval and military power had been laid during the First English Civil War (1642-1646), which saw the creation of the English Republic (1649-1660). The army and navy of the Republic briefly became the terror of Europe, defeating the powerful Dutch navy and savaging the decaying Spanish Empire. However, not until after the War of the Glorious Revolution (1689-1692), which established the principle of parliamentary sovereignty, could the English government harness its country's commercial wealth and thereby establish its military strength on a firm foundation. During the 1690's, the English navy surpassed the French navy as the strongest in Europe, a position it would hold into the twentieth century.

WEAPONS, UNIFORMS, AND ARMOR

For much of the seventeenth century, the heavy matchlock musket and the long pike were the dominant infantry weapons. By the end of the century, both had been largely replaced by a single weapon system: the flintlock musket fitted with a socket bayonet.

Although the matchlock musket was effective against body armor, it was unreliable, with a misfire rate of about 50 percent. Its operation depended on a continuously burning "slow" match, which could easily be extinguished by rain and wind. Furthermore, the rate of fire was slow. Soldiers could fire about one shot every two minutes, even after the development of drills to teach loading. Although more sophisticated ignition systems, such as the wheel lock and the flintlock, were available, they were often prohibitively expensive. In addition, the wheel lock, although widely used in cavalry pistols, proved too fragile for infantry use.

The sturdier flintlock began to be issued in musket form to elite infantry units around the middle of the seventeenth century, by which time flintlock pistols

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A skirmish before the Battle of Poltava in 1709. Only after the Russian forces had maneuvered into a favorable position did the entire army engage in battle.

had largely replaced the wheel lock among cavalrymen. By 1700, flintlock muskets had become the most common infantry firearm, allowing a significant improvement over the matchlock in both rate and reliability of fire.

Plug bayonets, so named because they were inserted directly into the muzzle, were used throughout the century but were never very popular, because, when mounted, they blocked the gun from being fired. In 1687 French military engineer Sébastien Le Prestre de Vauban (1633-1707) invented the far superior socket bayonet. Because the socket bayonet fitted around, not inside, the muzzle, the gun could be both loaded and fired with the bayonet attached. Socket bayonets were soon adopted throughout Europe. By effectively converting every musket into a spear, socket bayonets also rendered the pike obsolete.

Steel armor, widely worn by infantry into the mid-seventeenth century, was largely abandoned by the 1690's, because it offered too little protection against gunfire to justify its weight and cost. Only heavy cavalry continued to wear armor, but only breastplates and backplates, and not the helmets or the arm and thigh protection that had been carried into the 1640's.

Grenades became popular in the waging of siege warfare, and special units of infantry known as grenadiers appeared. Although the grenade was their main weapon, the term "grenadier" soon came to be used as a general designation for elite troops.

Standardized uniforms became increasingly common in the seventeenth century. Early in the century, colonels often outfitted their regiments with uniforms of a single color, but the English adopted the first armywide standard uniform color when they introduced their famous red coat in 1645. By the end of the century, uniforms of a single color for whole armies had become the norm, with individual regiments distinguished by different-colored lapels and cuffs.

Artillery also tended to become standardized around weapons of a few calibers rather than the miscellaneous collection of guns that had characterized sixteenth century artillery. Artillery also became lighter and more mobile during the seventeenth century.

Turning Points

1600	The Battle of Nieuwpoort is the first battlefield test of Maurice of Nassau's linear infantry tactics.
1609	The Netherlands forces Spain to grant a truce tacitly recognizing Dutch independence after over thirty years of revolution of Dutch Protestant provinces against Spanish occupation.
1631	The Battle of Breitenfeld is successful test of Gustavus Adolphus's military reforms.
c. 1687	Sébastien Le Prestre de Vauban invents the socket bayonet, which attaches to the musket barrel and allows simultaneous use of the musket.
1697	The European balance of power is shifted at the end of the War of the Grand Alliance.

Military Organization

Although sixteenth century peacetime standing armies were small, consisting chiefly of royal guards and fortress garrisons, the seventeenth century was characterized by large standing armies and navies. The Dutch republic set the example, keeping some 30,000 men under arms after its truce with Spain in 1609. In contrast, France, with ten times the population of the Netherlands, had only 10,000 soldiers at that time. The Dutch, and later the Swedes, also pioneered the creation of a professional, long-service officer corps. The Dutch also led the way in creating a professional navy, although the English had surpassed them by the 1650's.

Standing forces with professional officers could be far more effectively drilled and disciplined than forces raised, or hired as units under the contract system, for a single conflict. The dangers of mercenaries are well illustrated by the career of Count Albrecht Wenzel von Wallenstein (1583-1634). Wallenstein's position as a military contractor on a grand

scale allowed him to pursue policies so at odds with those of his nominal employers, the Austrian Habsburgs, that they felt compelled to assassinate him. By the end of the century, all major powers maintained standing armies, divided into regiments, the basic military administrative unit. Some countries, notably Sweden, even began to employ conscription as a means of raising armies.

Standing forces, whether composed of volunteers or conscripts, were expensive. The creation of new military agencies was required to administer and supply these standing armies. Bureaucratic development reached a peak in France in the second half of the century, as the nation's peacetime army expanded to around 165,000 men, with a maximum wartime strength of nearly 400,000 men. France also established the first professional military engineering corps in Europe and created a huge military support structure, featuring a system of supply depots or "magazines," hospitals, barracks, and naval arsenals, which provided a model soon copied by the other powers.

DOCTRINE, STRATEGY, AND TACTICS

The seventeenth century was an age of sieges. Fortresses played a critical role in the domination of territory. If a hostile fortress were in the area, a substantial body of troops would be required to surround it fully. Otherwise, units sallying out of the fortress could disrupt supply lines and foraging parties, preventing offensive operations. A fortress could completely block the use of a river on which it was stationed, a crucial defensive factor, because rivers were far and away the best lines of supply, given the poor state of roads throughout Europe in the 1600's. A fortress built on hostile territory could serve as a supply magazine and a secure jumping-off point for offensive operations.

It is not surprising that much effort went into the design of better fortresses and siege techniques. From the 1660's onward, the French, under the guidance of Vauban, led the way in fortification design and siegecraft. Vauban devised a new system of advancing in successive parallel trenches, which sealed off the fortress and allowed the relatively secure deployment of devastating artillery fire against the fortress walls.

If the assault and defense of fortresses increasingly ruled strategy, it by no means eliminated battles between field armies. Interest in the improvement of battlefield tactics remained high throughout the century. Infantry were traditionally deployed in squares of pikemen, fifteen ranks deep, surrounded on all sides by musketeers. Although this formation was defensively effective, it was inefficient in the use of manpower. Beginning in the 1590's, Maurice of Nassau replaced these square formations of around 1,500 men with a more linear formation of about 800 men as the basic tactical building block. The new formation was still composed of pikemen and musketeers, but these were now deployed in only five ranks, with the pikemen in the center and the musketeers on the wings. Because the formation was more shallow, it could actually occupy a longer front and bring more muskets to bear to the front. To make this musketry effective, Maurice developed elaborate drills to allow some men to reload while others fired, permitting a continuous fire. These new tactics required almost mechanical discipline, something best achieved by professional forces.

Successfully tested at the Battle of Nieuwpoort (1600), Maurice's new "linear" formations were copied and improved upon by Gustavus II Adolphus, beginning in the 1620's. By the end of the century infantry formations had become increasingly linear, typically only three ranks deep.

As infantry formations became less capable of all-around defense, cavalry played increasingly decisive roles in battle. The mark of a superior tactician, such as the Great Condé, came to be in timing the launch of a decisive cavalry charge. Cavalry required reforms to become truly effective in this newly decisive role. At the beginning of the century, most cavalry in Western Europe had abandoned the heavy lance and adopted the pistol as their principal weapon. Instead of charging in lines, they attacked in a snakelike formation, the caracole, designed to facilitate the reloading of pistols.

Influenced by his experience fighting the Poles, Gustavus II Adolphus, who had never abandoned

the traditional cavalry charge, trained his cavalry to charge in lines, using their swords instead of pistols. Another of Gustavus's pioneering military reforms was his use of more mobile field artillery, which assisted cavalry shock action by softening up infantry formations in preparation for the cavalry assault. Gustavus based his revolutionary battle tactics on mobility and firepower, arranging his infantry in more shallow formations to fire heavy volleys on command. As successful commanders increasingly came to agree with Gustavus, firepower increasingly dominated infantry tactics, while shock increasingly dominated cavalry tactics.

Naval tactics also evolved throughout the seventeenth century, with the development of the line of battle by the English navy in the 1650's. The line of battle formation, which had become universal by the 1670's, maximized the importance of broadside firepower and allowed for more effective deployment of shipboard artillery.

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Sébastien Le Prestre de Vauban wrote a number of military works, especially on siege warfare, of which he was probably the greatest practitioner of all time.

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Mark S. Lacy

The Era of Frederick the Great

Dates: 1712-1786

Political Considerations

Military and naval combat in the 1700's, the era that came to be dominated by King Frederick II of Prussia (or Frederick the Great, 1712-1786), saw changes in the style, organization, tactics, and strategy of engagement. These modifications were, in part, political and economic, according to needs of the states in question, but they were also taught by generals in the field or by independent military reformers who sought to contribute their observations and experience.

Between 1667 and 1713, King Louis XIV (1638-1715) committed France to various wars, seeking first to expand his nation and then to take the throne of Spain. Austria, England, and the Netherlands resisted until Louis's armies finally began to falter. Between 1704 and 1709 France's most able generals were defeated, and the way was opened for a compromise peace in 1713.

More than forty years of war, however, had seriously undermined the strength and financial stability of most European governments. As a result, these nations had trouble operating at prewar budgetary levels and were unable to field armies that were equipped and trained as they had been during the late 1600's. France, whose army had been the largest and best in Europe for nearly a century, was bankrupt, and Austria was deep in debt. Sweden had exhausted itself in its fight with Russia for control of the Baltic area. Russia, Sweden's foe, now secure in its outlet to the Baltic Sea and, after 1725, free of Czar Peter I (1672-1725), wished to reexamine its involvement in Europe. England, drained, but somewhat better off than its allies, desired to shift its resources elsewhere.

The passing of the best generals of the early eighteenth century influenced European states to curtail their aggressive policies. European rulers lacked sufficient finances to fund costly wars and were hesitant to trust poorly equipped armies to leaders with limited experience. In the Seven Years' War (1756-1763), for instance, only one of six French commanders was competent. Consequently mid-eighteenth century Europe found itself in a military void that the small state of Prussia was quick to exploit. Frederick II, Prussia's ruler, took advantage of his opponents' limits, seizing Silesia from Austria in 1740 and holding it until 1763 despite attacks from France, Austria, and Russia. This triumph, which made Frederick famous, also elevated Prussia to the status of a great state.

France's military humiliation by Prussia, coupled with its financial distress and with absolutism's inability to function properly under the regimes of Louis XV (1710-1774) and Louis XVI (1754-1793), made political change in that nation inevitable. A revolution in 1789 was followed

Turning Points

mid-1700's	Advances in cannon technology allow smaller guns to shoot farther with less powder.
1757	Frederick the Great wins renown and respect with his masterful use of the oblique attack at Leuthen.
1778-1779	Frederick the Great begins deploying semi-independent detachments during the War of Bavarian Succession, foreshadowing use of independent army divisions.
1782	British commander George Rodney defies prevailing military wisdom by attacking weak points in the French line at Les Saints.
1798	British admiral Horatio Nelson abandons traditional line tactics in victory over French at Abū Qīr Bay.

by a continental war that introduced technical, tactical, and strategic innovations to the military arena.

Library of Congress

King Frederick the Great reviews his troops.

MILITARY ACHIEVEMENT

Warfare in the age of Louis XIV had been a product of the 1600's. Professional soldiers and sailors sought to disengage, rather than to engage. To fight meant to risk both reputation and army. To win without fighting, commanders largely ignored mobility and methodically maneuvered for the best position. Battle was offered only when the advantage was theirs and pursuit, in the event of victory, was generally refused as an unnecessary risk. Further, to buttress this basically defensive posture, the Dutch, the Austrians, and the French built massive interlocking fortresses and supply depots that were designed to protect the frontier and either to slow or to halt an advancing enemy. It was an age in which Sébastien Le Prestre de Vauban (1633-1707) and Baron Menno van Coehoorn (1641-1704) were the premier fortress builders on the continent and defined the war that military leaders such as Claude-Louis-Hector de Villars (1653-1734), François de Neufville, marquis de Villeroi (1644-1730), and Louis-François de Boufflers (1644-1711) practiced.

Still, not everyone conformed to the expected defensive norm. Austrian general Eugène of Savoy (1663-1736), for one, was noted for his forced marches, surprise attacks, and flank movements. His rapid victory at Turin (1706) was decisive and helped to reduce French forces in Italy. He was supported by his friend and fellow soldier John Churchill, first duke of Marlborough (1650-1722), who preferred night marches and interior lines of movement. Churchill's opinion that a single victory was "of far greater advantage to the common cause than the taking of twenty towns" was reinforced by that of Eugène. During the War of the Spanish Succession (1701-1714), unbeknownst to the enemy, the two friends unexpectedly combined against a French army at Blenheim (1704), turned its flank, and dispersed it, capturing most of the survivors. Two years later Churchill accomplished the identical feat at Ramillies-Offus. In 1708 the men reunited, through forced marches, at Oudenarde, turned both flanks of an unprepared French army, and drove it from the field. Unfortunately, a similar linkup at Malplaquet in 1709 was met and badly repulsed, hindering a fuller acceptance of the doctrine of mobility.

It remained for the young king of Prussia, Frederick II, to undercut the doctrine of defense, impressing all of Europe with his concept of movement and attack. For Frederick the objective was not to hold territory but to force the enemy to give ground. Through experience, he learned to avoid costly sieges and set battles and instead sought short wars to maximize his limited resources. He also utilized rapid movement, interior lines of march, and the element of surprise to keep his multiple enemies off balance. "I have so many enemies that I have no choice but to attack," he

F. R. Niglutsch

The duke of Marlborough leads his troops during the Battle of Blenheim (1704).

wrote in 1759. "I have only kept going by attacking whenever I can and by scoring little advantages which add up." He surprised and routed the Austrians at Hohenfriedberg (1745) in the War of the Austrian Succession and ambushed the French flanking column at Rossbach (1757) during the Seven Years' War. Yet it was his masterful use of the oblique attack at Leuthen (1757), Zorndorf (1758), and Torgau (1760) that won Frederick fame and respect.

Ships, like armies, were expensive and were not intended to be chanced to the fortunes of war. A commander should, in the words of a seventeenth century writer, "keep his ship and his men out of danger." Vessels and fleets were expected to maintain lines of supply by sea, blockade enemy ports, and, whether engaged in single-ship or fleet action, to remain on the defensive and not to risk vessels' giving chase to defeated foes. Fleet commanders were further required by their permanent orders to avoid, whenever possible, engaging in battle, but if forced, to take "a line of battle [parallel to that of the enemy as] the basis and formulation of all discipline in sea fights." From these lines each side would fire at the other from a distance, each with the hope that the other would make a mistake or lose the wind. During the War of the Grand Alliance (1688-1697) the French did not pursue defeated Dutch and English forces at Beachy Head (1690), and at La Hogue (1692) the English were not permitted to follow up on significant French losses. In each case a continued engagement could have meant the destruction of the fleeing ships. It remained for Lord George Rodney (1718-1792) to challenge convention at the Battle of Les Saintes (1782). He took advantage of breaks in the French line caused by the wind and sent his ships through them to wreak havoc. Rodney gained great acclaim

but was deprived of his command for exceeding his instructions. Even more unfortunate was Sir John Byng (1704-1757), who in 1757 was court-martialed and shot for failing to comply with his instructions. In 1798 Horatio Nelson (1758-1805) followed up on Rodney's work by abandoning traditional line tactics and capturing all but two French ships at Abū Qīr Bay, off Egypt. As a result Nelson was given a better command and made a baron.

WEAPONS, UNIFORMS, AND ARMOR

Military equipment remained reasonably standard during the 1700's. European armies adopted similar-caliber flintlock muskets between 1692 and 1705, and this weapon, despite the introduction of the more accurate but less durable rifle, became the primary infantry arm of the century. Although heavy and cumbersome, it decidedly improved its user's killing efficiency. Firearms, rather than swords, daggers, and pole arms, now decided battles. The centuries-old pike was replaced by a bayonet that locked onto the end of the musket, allowing the musket to be used simultaneously as both a firearm and a shortened pike.

Of all weaponry, artillery displayed the most noticeable improvements. At the beginning of the century, cannons were divided into two categories: defensive for fortress use and offensive for regimental and siege work. The latter accompanied the army in long artillery trains and were heavy, cumbersome, and slow to move, hindering the offensive movements so important to men such as Eugène, Churchill, and Frederick the Great.

Change, however, followed the War of the Spanish Succession. Jean de Maritz (1680-1743) revolutionized the casting of cannon, allowing for smaller guns to fire a projectile farther and use less powder. This development enabled Europeans to make lighter, smaller artillery pieces, often 4-, 8-, and 12-pound guns, and to increase their maneuverability on the battlefield.

Uniforms, standard by 1700, changed little until the French Revolution of 1789, but armor was almost totally discarded. Only in the heavy cavalry, and especially among the French, was armor retained. Deflective chest plates were worn on the front and the back, but they were unable to withstand direct musket fire. Regimentals remained much the same until the *levée en masse*, a French draft of sorts, mandating large numbers of new battalions, including light infantry and cavalry. At this point, and especially under Napoleon, different uniform designs and colors would proliferate.

Naval ships of the period changed little. The ships of most nations were similar in design; the vessels of individual navies differed only in construction techniques, quantity, and quality. France, for example, built a better ship and used fewer, but heavier, guns, whereas England, whose vessels sailed better, used sturdier construction. Yet, all nations divided their major capital ships into categories with the top three categories carrying more than 100 guns, more than 80 guns, and from 74 to 80 guns. The last, a third-class ship of the line, was generally the workhorse of every fleet.

R. S. Peale and J. A. Hill

Austrian soldiers captured at the Battle of Hohenfriedberg (1745) are marched past an army of the Quadruple Alliance.

MILITARY ORGANIZATION

Over the course of the century, organizational change brought larger armies, smaller but better-armed battalions, fewer cavalries, and a more effective use of artillery. In response to the strategies of military leaders such as Swedish king Gustavus II Adolphus (1594-1632), Churchill, and Eugène, continental states gradually decreased the number of men in a battalion, the primary building block of the regiment. By 1720 most armies had reduced their battalions to 500 to 700 men and had improved their deployment, thereby increasing firepower. Artillery, lighter and more numerous, was advocated by the late 1700's as a weapon to prepare the way for an assault. Massed cannons were used to good effect at Valmy (1792) and at Jemappes (1792) during the French Revolutionary Wars, but it was not until 1796 at Castiglione della Stivere during the Napoleonic Wars that guns were decisive in breaking an enemy line. In 1809, a hundred or more cannons paved the way for Napoleon's success at Wagram.

Due, in part, to the rise of nationalism, armies slowly increased in size. During the Thirty Years' War (1618-1648), they had averaged 20,000 to 30,000 men. By the time the War of the Spanish Succession began in 1701, armies frequently had from 60,000 to 80,000 soldiers per side. By 1805 to 1812 Napoleon Bonaparte was directing armies of 180,000 to 600,000 soldiers. The doctrine of attack and the increased size of forces now obliged generals to discard the seventeenth century concept of supply storehouses and to force traveling armies to live largely off the land. Although there was no division of an army into independent commands, divisions, or corps, the concept had already been foreshadowed in

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King of Prussia Frederick II made masterful use of the oblique attack at the Battle of Leuthen in 1757.

the writings of the French general Maurice, comte de Saxe (1696-1750) and Jean Du Teil (1738-1820). It became a reality when Frederick the Great, during the War of the Bavarian Succession (1778-1779), required his units to march to battle by separate routes, acting as semi-independent detachments. These precedents were absorbed by men such as Napoleon, who would later employ independent divisions successfully at Marengo (1800), Ulm (1805), Austerlitz (1805), and later battles.

While armies were increasing in numbers and units were being independently deployed, cavalry as a whole was being reduced, because it was less effective than infantry as a striking and killing force. Yet, light cavalry, like light infantry, was becoming increasingly popular. Such units were seen as useful in shielding maneuvering formations, artillery, and attacks.

A new formation, the column, was also emerging in French thought and training. It was created by Jean-Charles de Folard (1699-1752), who sought to save time in battle by using the marching column as a direct vehicle of attack, substituting shock for traditional firepower. His work was furthered by François-Appollini de Guibert (1744-1790), an organizer of France's citizen army of 1789-1790. Guibert recommended a restricted use of the column with an attack upon a narrow front or a salient. Massed artillery fire and sharpshooters could pin down the defenders as the attacking column, hopefully shielded by terrain, advanced. Folard and Guibert's work, intended as an option for traditional line tactics, soon became the standard for French revolutionary armies.

Doctrine, Tactics, and Strategy

The art of war evolved over the course of the eighteenth century. Tactics were no longer a matter of preserving an army, preparing and fighting a set battle, or using fortresses in order to remain on the defensive. By 1795 armies were expected, whenever possible, to seize and hold the offensive and to avoid sieges and fortresses. According to Napoleon, the best form of defense was attack. Strategically, European armies were beginning to understand that the defeat and destruction of the opposing force formed the object of warfare and that the loss or gain of territory was a secondary consideration. Gustavus, Eugène, Churchill, and Frederick were at last making their point.

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Louis P. Towles

The Era of Napoleon Bonaparte

Dates: 1789-1815

Political Considerations

Eighteenth century warfare prior to the 1789 French Revolution had been shaped by the political, social, and economic conditions of the day. Wars were fought over narrow dynastic issues by small professional armies. These armies were composed of soldiers from the lowest levels of society, commanded by aristocratic officers. Casualties were kept to a minimum, because each soldier represented a major investment of state resources, and battles fought using rigid linear tactics were seldom decisive. However, the French Revolution dramatically altered the basis of eighteenth century warfare. The revolution opened the way for an era of mass armies and full national mobilization and set in motion the transformation of France from a royal kingdom to a modern nation-state. The revolution enabled France to institute the *levée en masse*, a draft of citizen soldiers that supplied unprecedented levels of manpower for military service. To support this enlarged French army, the revolutionary government was compelled to mobilize the economic resources of the nation fully. After 1792, faced with the threat of internal counterrevolution and foreign intervention, France became a nation at arms; a full national response was needed to save the revolution from its many enemies. Armies increased dramatically in size, higher casualty rates became acceptable, and war became more decisive and total.

Revolutionary France could afford neither the expensive professional armies that were the hallmarks of the old style of warfare nor the time needed to train rough conscripts in the ways of rigid eighteenth century linear warfare. The revolution served to undermine the traditional aristocratic officers' corps. In the place of the old royal army, a new national army was formed, composed of conscript citizen-soldiers commanded by officers who advanced through their talent rather than their titles. The poor economic conditions in France produced armies that had to survive on the fruit of the countryside rather than depend on long baggage trains with overstretched lines of communication. The benefit of this otherwise unfortunate sitation was that the French army gained greater speed and mobility. The new armies of revolutionary France dominated the battlefields of Europe and won victory after victory. It took the military genius of Napoleon Bonaparte (1769-1821), emperor of France from 1804 to 1814, to realize the full potential of this new type of warfare.

Between 1792 and 1815 seven anti-French coalitions were formed by Great Britain, Russia, Austria, and Prussia. France's dynastic opponents had little choice but to follow the French military example or face defeat. With the exception of Great Britain, all the great powers copied the French military system to a greater or lesser degree. With its chief reliance on sea power, Britain remained conservative in its military thinking and committed to linear warfare fought by a small professional army. This system proved remarkably successful against the French in Spain and later against Napoleon at Waterloo. The combination of British financial resources and command of the sea made Britain the central power in the resistance to France's imperial ambitions. In the end, Napoleon's goal of achieving European mastery proved beyond the resources of France in the face of determined resistance by the other great powers.

Following Napoleon's downfall, the armies of Europe largely reverted to the traditional pattern of long-service professional armies. The conservative political and social order reasserted itself across Europe. While the nobility continued to dominate the ranks of the officers' corps in many armies, they did so to a lesser degree. With the reduction of foreign troops so widely employed in the armies of the eighteenth century, the rank-and-file soldiers of the nineteenth century chiefly served in the armies of their re-

F. R. Niglutsch

The foundations for the age of Napoleon were laid by the French Revolution, which is widely considered to have begun with the storming of the Bastille prison on July 14, 1789.

spective nations. A period of relative peace settled over Europe after Napoleon's defeat. No wars on the scope and scale of the French Revolutionary Wars (1792-1802) or the Napoleonic Wars (1803-1815) were waged. Nevertheless, the rise of modern nationalism and the spread of industrialization in the nineteenth century laid the foundations for the total world wars of the twentieth.

MILITARY ACHIEVEMENT

The Napoleonic Era ushered in a revolution in warfare: No longer was military power limited by the economic, political, and social conditions of the eighteenth century. The French Revolution produced the age of national warfare, in which the near-total resources of a nation were placed into pursuit of victory. Not only were large pools of manpower mobilized, but civilian resources were also tapped. War became more mobile, more destructive, and more decisive. To a large degree, the elements of this new type of warfare were in place prior to Napoleon's rise to power. Prerevolutionary military thinkers in the French royal army had published writings advocating change, and the various revolutionary governments of France had swept away the old army, opening the way for new military innovations. Apart from substantially improved artillery, the weapons used by armies of the Napoleonic period had changed little since the start of the eighteenth century. Key to the changes in warfare were the overall changes produced by an age of revolution. France's opponents had little choice but to adopt the new way of war or face defeat. The

armies of Britain, France, Austria, Prussia, and Russia would decide the fate of Europe on the battlefield.

Considered one of the most gifted generals in history, Napoleon dominated this period in the history of warfare. The French Revolution provided him with the tools of success and opened the way for his rise to power. Napoleon personally embodied the motto of careers open to talent. He fought nearly fifty pitched battles and won most of them. More than one hundred years after Napoleon's defeat at Waterloo, generals were still trying to copy his achievements. The stress on offensive operations became the accepted road to victory for all military establishments with the goal of quick decisive victories on the battlefield. It should be noted that the Napoleonic era also produced a number of capable generals other than Napoleon, including Louis-Nicolas Davout (1770-1823) and André Masséna (1758-1817), two of Napoleon's own marshals, as well as Arthur Wellesley, the duke of Wellington (1769-1852), Archduke Charles of Austria (1771-1847), and Russian prince and field marshal Mikhail Illarionovich Kutuzov (1745-1813). This period, with the introduction of systematic military education, ushered in the beginning of military professionalism. In 1802 the Royal Military College was opened at Sandhurst, England; West Point was es-

SELECTED BATTLE SITES IN THE NAPOLEONIC WARS

tablished in the United States in the same year; in 1808 St. Cyr opened in France; and Prussia's war academy, the Allgemeine Kriegsschule, was created in 1810.

WEAPONS, UNIFORMS, AND ARMOR

The battles of Napoleonic era were noisy, smoky affairs with the discharge of a great deal of black powder. Battlefields were often covered in dense, black smoke that limited visibility. A soldier in combat could rarely see much beyond the few yards in front of him as a battle unfolded. The primary infantry weapon of the period was the smoothbore, muzzle-loading, flintlock musket. The most famous muskets of the period were the British Brown Bess and French Model 1777. These weapons had changed little from the beginning of the eighteenth century; all were highly inaccurate and unreliable, with an effective range of 300 yards. The caliber of the weapons varied widely, and their low rate of accuracy made a high rate of volley fire essential. Army manuals of the day often stressed that soldiers should concentrate on rapid fire over aim. A well-trained soldier could produce a rate of fire of three shots per minute. Misfires in battle were common. Each soldier carried an angular sleeve bayonet that varied between 15 and 18 inches in length. The bayonet was used for shock on the battlefield and rarely for hand-to-hand combat. In addition to the smoothbore musket, soldiers were equipped with muzzle-loading rifles. Rifles had greater accuracy than muskets but had a substantially reduced rate of fire of ten shots in ten minutes. Muskets were the chief weapon of the line infantry. Rifles were employed chiefly by light infantry units for skirmishing.

North Wind Picture Archives via AP Images

French uniforms during the Napoleonic period (from left): for infantry, grenadiers, and cavalry.

Cavalry relied upon the saber and, to a limited extent, the lance. Cavalry units were divided into light and heavy formations. Light cavalry was used for reconnaissance and security and carried curved swords for cutting. Heavy cavalry was used to break the line of enemy infantry and carried longer and straighter sabers.

The lance was most effective against infantry or retreating cavalry. Short carbines and pistols supplemented the sabers, swords, and lances. Little armor was used in the Napoleonic era. Heavy cavalrymen known as cuirassiers were equipped with partial body armor that covered the upper part of the torso. They also wore helmets, gauntlets, and heavy

leather boots. The evidence would suggest that such body armor offered its wearer little protection.

Artillery during the Napoleonic era was, along with the infantry and the cavalry, one of the three main combat branches of the army. The effective use of artillery could often decide the outcome of a battle. Guns were divided into siege and field cannons. Prior to the French Revolution, artillery improvement had stood as the most important single advance in military technology. During this time, artillery pieces were made lighter and more mobile, so that they could be quickly concentrated on the battlefield wherever they were most needed. Artillery varied from the largest pieces, weighing more than 2,000 pounds and shooting 12-pound balls with ranges up to 900 yards, to smaller and lighter howitzers with ranges of more than 500 yards. Teams of draft horses were used to pull artillery pieces into action. Six horses were required to pull a heavy 12-pounder. Teams of four horses were required for the smaller 8- and 4-pounders. Three different projectiles were used. Round shot composed of a solid iron ball was the most widely used type of projectile. It was particularly effective against men lined up in dense formations. Explosive shells were fired by howitzers. For close work, canisters composed of many smaller iron balls in a metal casing were used to great effect against infantry. The British also used shrapnel or spherical cases packed with balls in an exploding shell. A unique artillery weapon was the Congreve rocket, invented by British artillerist Sir William Congreve (1772-1828) in 1808. The rocket, weighing between 5 and 32 pounds, produced much noise but proved highly inaccurate and unreliable in battle.

After the Napoleonic Wars, the percussion cap replaced the flintlock in firearms. The percussion cap allowed for a much greater rate of fire and fewer misfires. By 1849 Claude-Étienne Minié (1804-1879) of the French army had invented a conical-pointed cylindrical bullet called the Minié ball for muzzle-loading rifles, which provided increased rates of fire, accuracy, and range. With the Minié ball, killing range on the battlefield went from 100 to 400 yards. The rifled musket came to replace the smoothbore musket as the chief infantry weapon by the time of the American Civil War (1861-1865).

The advance of industrialization in the first half of the nineteenth century had a significant impact on military affairs. Introduction of the system of interchangeable parts made the mass production of weapons possible. Industrialization and the development of the steam locomotive had given rise to the development of the railroad by the 1820's. Railroads revolutionized warfare by providing armies with greater mobility and speed. The shift in military technology from smoothbore muskets to rifled muskets was not accompanied by a similar change in tactics on the battlefield. The consequences would be the heavy casualty rates of the American Civil War. Technological developments began to shift the battlefield advantage from offensive to defensive operations.

Although the Napoleonic period is often remembered for its elaborate uniforms, the reality was frequently far from ideal. Most troops, except for certain elite groups such as guard formations, had to make do with whatever clothing they could get. Few soldiers were ever fully outfitted in regulation uniforms. The scope of Napoleonic warfare placed great strain on governments' abilities to produce enough clothing for the needs of European armies. At times, even in the best-regulated armies, soldiers wore civilian gear.

Military Organization

Prior to the French Revolution, innovators in the old royal army introduced the practice of organizing armies into divisions that contained both artillery and infantry. Later, after the revolution, the divisional organization that contained infantry, cavalry, and artillery was introduced. Each division was capable of independent operations, greater speed, and increased mobility. In effect, each division functioned as a mini-army combining all three combat arms. By the time of Napoleon, with larger armies reaching numbers of 200,000 or more soldiers, divisions were grouped into corps for administrative purposes and for better command and control. Each division was organized into two or three infantry brigades of two regiments each and one brigade of artillery composed of two batteries. Corps were made up of two to

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Napoleon, mounted on a white horse, at the Battle of Austerlitz in 1805.

four divisions under a single commander. Most armies followed the French organizational pattern. Nevertheless, the British army was still organized into independent brigades until 1807, when they followed the French model and adopted divisional organization. For the ill-fated Russian campaign, Napoleon organized his vast army into three army groups composed of two to three corps each.

DOCTRINE, STRATEGY, AND TACTICS

Prior to the French Revolution, warfare had focused on avoiding costly, uncertain battles. The object of war was not to destroy the enemy but to achieve limited objectives with limited means. The French Revolution ushered in an era of total warfare, in which the objective became the destruction of the opposing force. With the advent of mass armies and the concept of the nation-at-arms, war grew in scope and scale. Military doctrine, strategy, and tactics reflected this change. The emergence of new military formations, especially the division and army corps, and the old concept of combined arms, or blending infantry, artillery, and cavalry together on the battlefield, made Napoleonic warfare possible.

Inspiration also came from the campaigns of King Frederick the Great (1712-1786) of Prussia, who stressed speed and mobility in war. Many of the ideals applied in the Napoleonic era were rooted in the writings of prerevolutionary French military thinkers such as Maurice of Saxony (1696-1750), Pierre-Joseph de Bourcet (1700-1780), and François-Appollini de Guibert (1744-1790), among others. Although many of the elements of Napoleonic warfare had been present prior to the French Revolution, they were not fully realized until the time of the French Revolution and the Napoleonic Wars.

Napoleonic warfare stressed quick decisions and decisive battles achieved by destruction of enemy field forces. The goal was to destroy the opponent's state of balance and will to fight while achieving economy of force in the pursuit of particular political goals. Better roadways and the combined arms divisional formation made this type of warfare feasible. Prior to the beginning of a campaign, detailed planning was conducted in order to leave little to chance. Alternative plans were also made to allow for the accommodation of changing circumstances. Flexibility, mobility, and opportunity were stressed. Once the campaign was under way, efforts were made to maintain good field security to conceal the intentions of the attacker from the enemy. Deception was often used. A cavalry screen was placed forward to disguise the line of operations and the makeup of the army. Each unit would march in self-contained divisions by different routes, staying within one or two days' marching distance from each other. Once contact was made with the opposing army, rapid, concerted effort took place, with the goal of achieving superior force on the battlefield and a quick victory. At this tactic, Napoleon stood out as the greatest strategist of the time; no other commander equaled his abilities.

Limitations of the weapons of the day determined battlefield tactics. From the onset of the French Revolutionary Wars, France relied on the column for attack. The often poorly trained citizen soldiers of France initially lacked the discipline and training to fight in the linear formation that was the standard for all other European armies. At first, large numbers of skirmishers would be placed in front of the attacking column. Napoleon came to rely increasingly on huge attack columns with a reduced number of skirmishers out front. One by one, except for the British, the other European powers followed the French example. Britain retained the line that was often formed into two ranks. The combination of steady troops, well trained in rapid musket fire, and the greater firepower offered by the line over the column accounts for the Duke of Wellington's victories over the French in Spain and at Waterloo. The British soldiers were noted for their ability to load and fire quickly on the battlefield. Wellington usually preferred to fight on ground, the reverse slope, which offered the best protection from artillery fire and masked portions of his army from the enemy. Confident in the steadfastness of his troops and in the superiority of the line that offered greater firepower over the attack column, Wellington was perhaps the only general of the era not intimidated by the new French tactical system.

The advances in artillery allowed for greater battlefield mobility and concentration. Light cavalry units were used in scouting and skirmishing roles. Heavy cavalry was used on the battlefield for its shock impact. The chief defenses against cavalry were concentrated artillery fire and the formation of infantry units into squares such as those employed by the British at Waterloo.

Library of Congress

Napoleon (center) examines a group of French soldiers at the Battle of Jena in 1806.

CONTEMPORARY SOURCES

The two most influential military thinkers of the period were Swiss soldier Antoine-Henri de Jomini (1779-1869) and Prussian army officer Carl von Clausewitz (1780-1831). Each of these men provided influential interpretations of Napoleonic warfare. Jomini had served on the military staff of Napoleon and that of Russian czar Alexander I (1777-1825) as well. His most influential work, *Précis de l'art de la guerre* (1838; *Summary of the Art of War*, 1868), came to be widely used by all Western armies. In it Jomini sought to identify what he saw as the unchanging principles of war by studying the conduct of military campaigns. He laid great stress on seizing the opponent's lines of communication. Once that had been achieved, a successful battle would follow, because the victorious army would have the overall strategic advantage as well as superior manpower and matériel. Jomini's writing, with its stress on unalterable principles of war, tended to prevent a careful review of the changing circumstances of nineteenth century warfare.

Clausewitz served in the Prussian army against Napoleon and went on to become the head of the Allgemeine Kriegsschule, the Prussian war college. His famous philosophical reflections on war were published after his death under the title of *Vom Kriege* (1832-1834; *On War*, 1873). Clausewitz argued that war was in fact a political act in which the chief goal was total victory. Unlike Jomini, Clausewitz rejected the ideal of unchanging principles of war. He argued that the conduct of war always changed due to new technological advances and altered circumstances. He contended that the main objective in war should be the destruction of the enemy's military forces. The ideals of Clausewitz had their greatest impact in the last quarter of the nineteenth century. Napoleon, the greatest soldier of the era, never wrote in a systematic way about his art of war. His writings and remarks were formed into a collection of a little more than one hundred maxims that served as the closest expression of his ideals of tactics and strategy.

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Van Michael Leslie

The Crimean War

Dates: 1853-1856

Political Considerations

The Crimean War (1853-1856), fought by Britain, France, and the Ottoman Turks against Russia, took place in an era during which the major European powers were in heavy competition over trade and territory as they sought to build their empires. This quest served to spur the technological innovations that would alter the shape of warfare in the nineteenth century. The invention of the telegraph meant, for instance, that field commanders were in close contact with government officials throughout military campaigns and that information about the campaigns could reach civilians on the home front much more quickly. The building of railroads meant that people and freight could be carried over large distances at faster speeds than ever before and that much land transport was no longer affected by the vagaries of weather. The invention of steam-powered ships similarly revolutionized naval warfare. The nineteenth century also saw early experiments with chemical warfare and the development of mines designed to affect shipping. Individual weaponry changed quite dramatically as well, as long-range rifles made muskets and bayonets obsolete. The most successful European powers were the ones that adopted new technologies, the fastest of which left others struggling to modernize their industries and armies.

Military Achievement

The Crimean War was sparked by rivalries between the great European powers. Russia had long coveted access to the Mediterranean Sea through the straits of the Dardanelles and the Bosporus, both of which remained in Turkish hands in the 1850's. Because Russia, France, and Britain were competing for trade with the Ottoman Empire, any Russian expansion into the Mediterranean could threaten the interests of Britain and France as well as the territorial integrity of the Ottoman Empire itself. The relationship between Britain and Russia was further complicated by each country's rival desires for influence in India and the Middle East. France was willing to block Russian expansion into Turkish territory but had its own interest in territorial expansion at the expense of the Turks in Egypt and other parts of North Africa.

In July, 1853, Russian soldiers marched into the principalities of Moldavia and Wallachia, then under Turkish control, and continued to advance east toward the Danube River. In early October, Turkey declared war on Russia and sent its armies toward the Danube and the Caucasus Mountains. During the winter of 1853-1854, France and Britain watched from the sidelines; their only action was to send some troops to stations in the Mediterranean. However, at the end of March, 1854, the Crimean War officially began when Britain and France declared war on Russia. The major military goal of the Allied forces was to invade the Crimean Peninsula and eventually to capture the Russian naval base at Sevastopol. Once that fortress finally fell in 1855, the war's major fighting ended and peace negotiations soon began.

Weapons, Uniforms, and Armor

During the Crimean War, the British and the French used much more modern weaponry than did either the Turks or the Russians. Every French infantryman was armed with a new Minié rifle. Although some British regiments still used the Brown Bess, a brown-stocked, 12-pound, .753-caliber flintlock musket with a range of only 100 yards, the vast majority of British soldiers were equipped with the American-made 1852 Enfield rifle. An improved version of the Minié rifle, the Enfield rifle used a .577-caliber bullet

MAJOR SITES IN THE CRIMEAN WAR, 1853-1856

with a range of 1,600 yards. It was deadly accurate at 800 yards. The Allied rifles could be loaded twice as quickly as could muskets. Allied cavalrymen were armed with sabers, steel-tipped lances, and carbines. Colt revolvers were also given to British cavalry soldiers but were seldom used, because they had a short range and were difficult to manage on horseback.

By contrast, only 6,000 Russian infantrymen were equipped with modern rifles; the remainder went into battle armed with smoothbore muskets. Turkish infantry also used the now-outdated smoothbore muskets. Turkish cavalry soldiers were issued short sabers and carbines that did not always work properly. The Turkish cavalry also tended to be poorly equipped with horses that were too small and old to compete with those of the other Allied armies. In addition, the saddles used by the Turks were often in poor condition and their spurs were rusty. The irregu-

lar cavalry, known as the Bashi-Bazouks, used any weapon possible, including bamboo spears. The Russian cavalry also tended to have smaller mounts, and its mobility was hampered because these smaller animals were expected to carry heavier packs than those borne by the horses of the other armies.

The armies that fought in the Crimean War were clearly unconcerned with camouflaging themselves from the enemy, wearing a variety of colorful uniforms and headgear. For instance, Sardinian riflemen wore light blue overcoats, blue turtleneck tunics, dark blue pants tucked into black leather boots, and wide-brimmed black hats with black rooster feathers. Other Sardinian troops were outfitted in green. Green was also used by the African-Egyptian troops from the Sudan who were part of the Turkish force. In this case, they wore bright green jackets and white trousers. Because the Turks did not have standardized uniforms, some of their other troops wore dark blue uniforms, gray woolen socks, and sheepskin sandals. Members of the Turkish irregular cavalry wore whatever they liked. The uniforms of the French and British troops were more standardized. French officers wore all blue, whereas the soldiers wore blue tunics, red trousers, and red caps. The Zouaves—elite French infantry troops who were originally Algerian tribesmen but now mostly European in ethnic origin—used the same color scheme, but their trousers were baggy and their red caps were so floppy that they resembled nightcaps. The British infantry was equipped with scarlet tunics and white leather crossbelts. Trousers were dark blue for the majority of the troops. The exceptions were the Scottish highland regiments, who wore kilts, and the light cavalry of James Thomas Brudenell, the seventh earl of Cardigan (1797-1868), who wore cherry-colored trousers.

A cartoon by John Leech decries the wretched conditions British soldiers faced in the Crimea. One soldier says to the other, "Well, Jack! Here's good news from home. We're to have a medal," and the other replies, "That's very kind. Maybe one of these days we'll have a coat to stick it on!"

The artillery forces wore blue uniforms. All soldiers wore stocks: tight leather collars that kept their heads erect. The headgear varied greatly among the British forces. Both brass and leather helmets were worn, as were black bearskin hats called busbies. Russian soldiers sported gray greatcoats over green or blue jackets and blue pants with a red stripe down the side. They also wore leather cross-belts and leather boots. Russian soldiers were all issued white linen undergarments in addition to the rest of their uniforms. Three types of headgear were used by the Russian army during the Crimean War: a black leather helmet with a brass spike on top; a tall shako, a stiff hat with a high crown and a plume; and a flat, visorless forage cap.

Typically, the soldiers who fought during the Crimean War were issued only one uniform, which was to be worn in all weather and on all occasions. It was intended that soldiers would receive a new uniform each year but would keep their greatcoats for a longer period of time. For instance, British soldiers were given a new greatcoat once every three years. Supply routes to the Crimea were poorly organized, however, and at one point, a freak winter storm destroyed some of the ships carrying new uniforms to the Allied forces. Many soldiers ultimately had to scavenge for their uniforms. Only the Russian soldiers seem to have carried extra shirts, socks, trousers, and leather boots with extra soles in their knapsacks. Muslim members of the Turkish army each carried a prayer rug as part of their equipment.

The Crimean War featured the heaviest artillery bombardments the world had seen to that point. Soldiers were able to fire 200-pound explosive shells over a distance of several miles. These massive shells were specifically designed to destroy heavy fortifications. Smaller 32- or 68-pound shells could, similarly, be launched over great distances. Some cannonballs were made from solid iron so they would smash through anything in their path. Other balls were purposely heated so they would start fires on impact. Most shells, however, were explosive and timed to explode either in the air or just after impact. Some shells hurled only the metal from their casings, whereas others contained other, smaller shells or grenades to cause a chain of explosions.

The Turkish military engineers proved to be the best in battle. Their artillery was excellent and accurate, and their soldiers were equipped with modern British cannons. The British Royal Horse Artillery was equipped with the same 6-pound cannons, but the British troops were less well trained in this area than were the Turks. The heavier siege guns of the British were not as good as those of the French or Russians. During the Crimean War, the Russian army proved particularly innovative in this area and pioneered the use of rockets, horse-drawn artillery, and heavy siege guns.

Mines were used by both the French and the Russians during the Siege of Sevastopol. The French tried to put mines under the defenses of the city, but their mines had conventional fuses that sometimes went out before detonating. The Russians were more successful. They would tunnel under the French tunnels and set off mines that detonated electronically.

The Crimean War involved naval power as well as artillery and mines. At the time, Britain had the world's best navy, with more total ships, more steam-powered ships, and better long-range guns than any other power. The French navy was weaker than that of the British but was stronger than those of the Russians and Turks. In total, the British and French fielded a combined eight triple-decked battleships, twenty-two double-decked battleships, seven frigates, thirty paddle-driven warships, and several hundred troop transports. By comparison, the Turkish navy had only six, severely outgunned battleships in the Black Sea and almost no steam-powered ships. Similarly, the Russian navy had yet to convert its ships to steam power, and its naval forces are best remembered during the Crimean War for the role they played in the defense of Sevastopol, sinking six ships to block the entrance to the city's harbor and then removing the guns from their ships for use on land.

Military Organization

The armies that fought the Crimean War were similar in structure but different in composition. Each army had infantry and cavalry divisions. The cavalry was usually split between light and heavy brigades with

the heavy brigades featuring larger men and horses. The Russian Cossack units and the Turkish Bashi-Bazouks served as irregular cavalry. The French also had a group of elite infantrymen, called the Zouaves.

Russia relied on an army of serfs. The recruits were chosen by their owners or by village councils and saw their twenty-five-year terms as death sentences. Few of these soldiers were literate, and they received no further education during their time in the army; thus, they had little incentive to fight. For infringements of discipline, the Russian troops were subject to physical punishments such as punching or flogging. Soldiers typically formed "artels," groups of ten men who shared food and supplies and looked after one another. These were not official army groupings but functioned similarly to the artels, or craftsmen's and workers' cooperatives, formed in Russia.

One-sixth of officers came from the nobility, and promotion was often based on family connections and wealth rather than on merit. Since the czar was the ultimate commander, he made decisions about promotion and could intervene in any aspect of the running of the armed forces. The remaining officers were "junkers," the sons of petty nobles who had not succeeded in secondary school and could find no career other than the armed forces. The junkers served in the ranks for six years before earning their commissions. Corruption was widespread in the Russian army, and the officers frequently stole money allocated for arms and supplies. Russian officers who wanted to evade the dangers of battle could buy medical certificates asserting they were wounded and no longer capable of active service.

The vast majority of British troops were volunteers: Only 1 percent were criminals and vagrants being punished by the legal system. Wages were a shilling a day. Infantryman signed on for a ten-year period, whereas cavalryman served twelve-year terms. Irishmen had flocked to the British army during the Great Potato Famine of 1845; by the time of the Crimean War, fully one-third of the British troops were Irish. Although the British also hired mercenaries from parts of Germany, Sardinia, Switzerland, and the United States, these men were sent home before seeing action in the Crimean War. Almost all of the officers in the British army came from society's elite. One-third were from titled or landed families, and the rest came from families associated with the so-called gentlemen's professions, such as the clergy and the law. British officers tended to be well educated but had little formal military training. Since both commissions and promotions were sold, the wealthy dominated the higher ranks of the armed forces, and British officers could sell their commissions and go home whenever they wished.

The French army emphasized merit rather than birthright. Few officers were from the nobility. Instead, they had to earn their promotions and to live on their military salaries. Consequently, they had more sympathy and understanding for the men under their command. Whereas British officers spent little time with their soldiers, French officers would more frequently share the living and dining quarters of their men. French soldiers were conscripted by lottery for six-year terms, and during their service they were given rudimentary education in hygiene, history, and the meaning of morale and military spirit. They were not subject to flogging or other forms of corporal punishment.

After a series of defeats in the eighteenth century, the Turks began to reform their army along French and Russian lines. By the start of the Crimean War, these reforms had seen some success: Junior officers were literate and had received some military training. However, they were resented by many senior officers who remained illiterate. Cor-

TURNING POINTS

1807	American inventor Robert Fulton invents the first steamship, which by the time of the Crimean War has largely replaced the sail-powered ships in British, French, and American navies.
1834	Turkey creates its first military academy.
1840's	The telegraph becomes widely used and links governments with field commanders.
1847	The first use of anesthesia during a battlefield operation.

ruption affected the Turkish army's ability to supply itself, because officers often siphoned off money allocated for provisions in order to pay the bribes needed for promotions. The Turkish force was multinational in its composition: Some officers were Hungarians, Italians, and Poles who had fled their homelands, and the infantry had come from all over the empire. Desertion was a problem among the infantry, because conscripted peasants from Armenia, Tunisia, Romania, and Egypt felt little loyalty to the Ottoman Empire that had conquered their homelands. Even if the troops did remain with the army, they fought with little enthusiasm.

The Granger Collection, New York

An engraving depicting the famous Charge of the Light Brigade, at the Battle of Balaklava (1854).

Women and children were also part of the Crimean War. All sides had female nurses, and children served as buglers and drummers. Roughly 10 percent of the Allied soldiers were legally married and, according to regulations, four wives per company of one hundred men were allowed to go with the troops in order to cook and do the laundry. Wives who already had children were not eligible to accompany the army. The wives frequently served as nurses in field hospitals as well. In the field they carried all of their belongings on their backs and, if they were widowed in the course of a campaign, they were left to fend for themselves by sleeping in ditches or dugouts. Because widows' pensions did not exist at the time, it was difficult for widows to return to their native countries. However, it was also economically challenging for a wife to remain in her native country while her husband left to fight overseas. Governments and armies made no provisions for the economic survival of women and children left behind, so women were sometimes forced to rely upon their needlework skills, prostitution, or charity. It was not unheard of for women to stow away on troop ships, or even to commit suicide, after their husbands' departure for the Crimea. The wives of Allied officers seldom accompanied their husbands, although a handful of aristocratic women did visit the Crimea in the summer to offer social amusements to the commanding officers. The wives of Russian soldiers remained behind in their native villages. Few Russian officers' wives chose to join their husbands during the war.

Doctrine, Strategy, and Tactics

In most armies at the time of the Crimean War, there was a clear division between the officers and the enlisted men. The officers tended to be aristocrats who were schooled from childhood about honor and glory. There was a sense among many officers that there was no glory in a death other than in combat and that cowardice meant certain disgrace. The quest for glory led to several actions during the war that can only be labeled military follies, the most stunning example being the infamous Charge of the Light Brigade (1854), commemorated in a poem by Alfred, Lord Tennyson (1809-1892). Rank-and-file troops often had a perspective on the war that was different from that of their commanders and were motivated by appeals to national pride, regimental pride, or a sense of competition between regiments.

In the 1850's army officers were not typically

trained to think about supplies or to plan ahead. This lack of emphasis on strategic planning meant that the Allied armies entered the Crimean War without any knowledge of battlefield terrain. The commanders were also ignorant of the local climate and the size of the forces they would face. For instance, the British commander Fitzroy James Henry Somerset, the Baron Raglan (1788-1855), assumed that fresh water supplies and horses would be available. The British took neither medical supplies nor their hospital wagons with them during the invasion of the Crimea and, in fact, made no provisions at all to care for wounded soldiers. The supply base built by the British was at Balaklava, at times more than 9 miles from the front lines. The only way to the base was along a dirt road that ran uphill and became a river of mud when it rained. The situation was made worse by the lack of pack animals; all supplies had to be carried to the front by the soldiers themselves. Only at the end of April, 1855, was a rail link completed between the British supply base at Balaklava and the front.

The British were not alone in these oversights, however; the Turks had little transport to speak of and had made an agreement with the British to supply them. Because the Turks did not organize their own supply trains and the British were not in a position to fulfill the agreement, Turkish soldiers were forced to live off the land. The French were closer to their supply base and were accompanied by *viviandières*, young women who acted as provisioners for the French troops. Because the French had brought pack animals to use for the transportation of material, they transported food and ammunition for all of the Allied armies. The situation was equally bad for the Russian soldiers. Their officers frequently stole the funds allocated to purchase food, and supply conveys were often delayed by poor weather.

The officers who served during the Crimean War were no better at planning battles than they were at organizing their forces. Despite the creation of a Turkish military academy in 1834, many senior Turkish officers remained illiterate. British officers received little formal military training, and the vast majority had not studied maps, topography, or military tactics. Moreover, in peacetime these officers spent little time with their regiments and preferred to leave the day-to-day management to their sergeants. Similarly, Russian officers were not required to have any formal knowledge of military tactics. Only the French officers received a solid military training at several military academies. They were expected to study map reading, tactics, fortification, and topography. Their grasp of the material was tested through regular examinations and regiment inspections, but the training of the French officers was nullified once the campaign in the Crimea began. British senior officers did not get along well with the French commanders, who tended to come from less distinguished and less wealthy families. Because the Allies needed to coordinate their forces in battle, it was imperative for the commanders to agree on a strategy. However, as the war began the Allies could agree upon no coordinated plan. Joint command quickly broke down amid personal rivalries between the commanders. The lack of coordination was most evident during the Siege of Sevastopol. The original plan was for the Allied armies to attack the city from the north, destroy the city's docks, and sink the Russian fleet. However, this plan was eventually abandoned in favor of a joint British and French attack from the south. The Turks took no direct part in the Siege of Sevastopol. A strong assault as soon as the British forces were in place would most likely have succeeded in taking the city, but the French commanders insisted on waiting for the arrival of their siege guns before the engagement began. In the end, the Allies camped nearby and waited for almost a month before firing any weapons at the city's defenders. The reprieve gave the general in charge of Sevastopol's defenses time to build a series of fortifications and await reinforcements. By the time the British and French commanders agreed to attack the city, it was virtually impregnable. It ultimately took almost a year for the Allies to take Sevastopol.

The Crimean War saw two distinct types of warfare: land battles and sieges. The tactics used by the armies varied depending on the situation and on their national traditions. During land battles, the British infantry would advance in a line, unhurriedly and silently, toward the enemy fire. In contrast, the French commanders encouraged individual initiative and had trained their troops in athletics, hand-to-hand

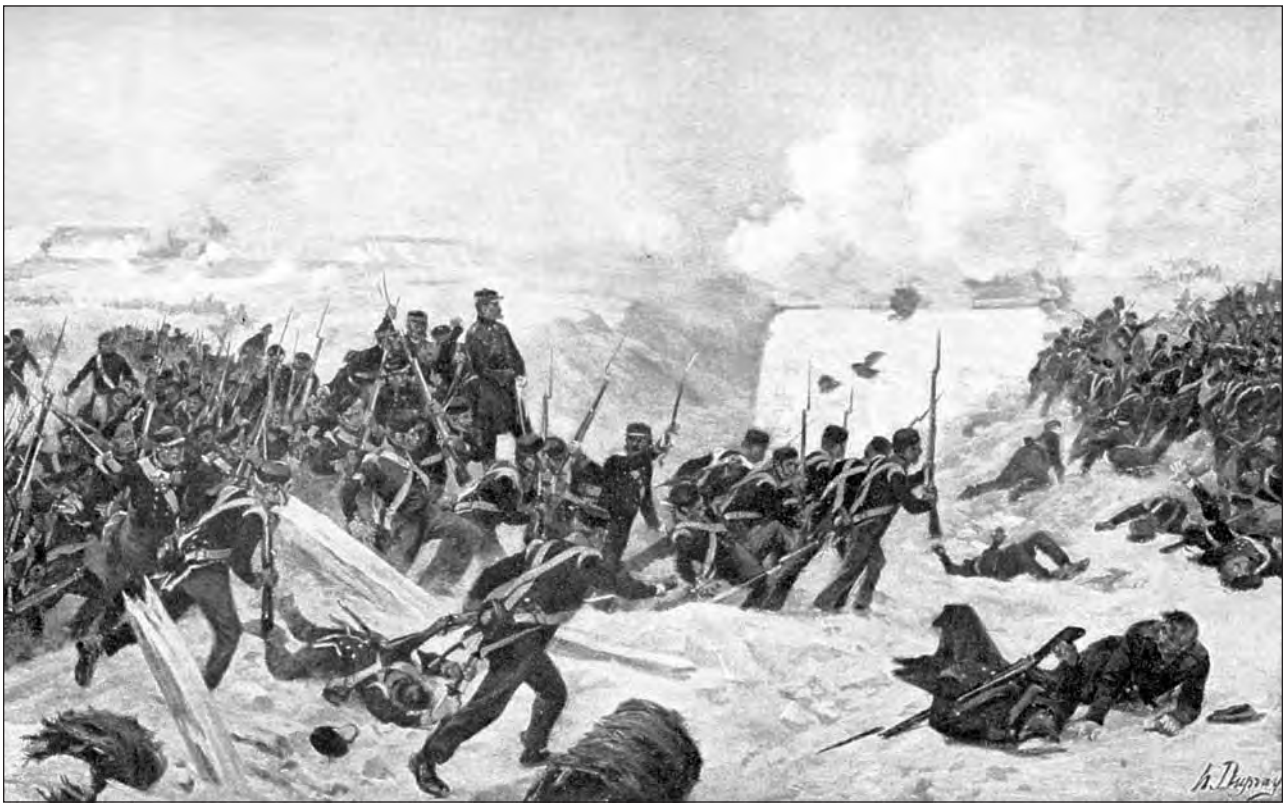
combat, and mountain climbing. French soldiers rushed to the attack as quickly as possible, in part because their officers believed they would retreat otherwise. Both the French and the Russians would scream and shout as they advanced. The Russian army's main infantry tactic was to have the troops advance in densely packed columns at the same time as the enemy approached and to fire at the enemy as the Russians advanced. The troops were told that aiming was not important, and few of the bullets found their mark, because target practice was not part of a Russian soldier's normal training. After using their firearms, the Russians would then charge with their bayonets. The types of advances used by all of the armies in the Crimean War actually made it easier for the enemy to kill the advancing soldiers. Troops were often under fire for more than a mile before they engaged the enemy in hand-to-hand combat. Moreover, in their brightly colored uniforms, soldiers could be seen so far away that advances lacked any element of surprise. Joint maneuvers also proved difficult during the war. No army would agree to deviate from its tactics in order to better synchronize an attack. Instead, for instance, the British soldiers were told to maintain the discipline of their advance and not to try to match the pace set by the French. Commanders, often within the same army, proved reluctant to communicate with one another during a battle.

Should an infantryman survive the initial advance and meet the enemy, hand-to-hand combat would begin. All types of weapons would be used: bayonets, swords, stones, even feet and teeth for kicking and biting. Rifle butts frequently served as clubs. All troops were trained to rely on their bayonets more than any other weapon.

The cavalries were also part of land battles during the Crimean War. Both the British and the French successfully used cavalry charges against the enemy. They benefited because Russian infantrymen were not instructed on how to defend themselves against enemy cavalry charges. In contrast, Russian dragoons would ride into battle but fought on foot, and the regular Russian cavalry did not demonstrate the iron discipline needed for a successful charge. Things were even more difficult for the Turks; the Bashi-Bazouks, although clearly the most superb of

P. F. Collier and Son

British troops at the Battle of Balaklava in 1854.



F. R. Niglutsch

The final assault by the allied forces at Sevastopol in 1855.

the Turkish horsemen, refused to fight against regular cavalry and had to be used to terrorize enemy civilians instead.

Infantry advances and cavalry charges continued to be used during the Siege of Sevastopol but were supplemented with several other tactics as well. Before the soldiers would attack, the Allied armies would pound the city with heavy artillery bombardments and try to tunnel under the Russian fortifications. New long-range rifles meant that sharpshooting emerged as an effective tactic during the Crimean War. Under the cover of darkness, a sniper would crawl toward the enemy lines and dig a foxhole. Then he would wait until daylight revealed a target. Other nighttime activities developed during the Siege of Sevastopol, in which the Russians engaged in nighttime raids on enemy trenches in order to kill sleeping soldiers and capture prisoners who could supply them with information. Indeed, all sides relied on spies to obtain information about the enemy. Suspected spies, however, would be shot if they were captured.

CONTEMPORARY SOURCES

A variety of contemporary sources are available to readers who wish to know more about the Crimean War. British newspaper correspondents accompanied the British army and telegraphed their stories to London, where the items would be published without censorship. *The Times* had a circulation of 40,000 copies per issue at the time of the Crimean War. The French were also accompanied by correspondents, but their stories were subject to strict censorship and, consequently, are not as accurate as those that appeared in British newspapers.

Many participants in the Crimean War wrote accounts of their experiences both immediately after the war and for many years following it. Some of the English-language memoirs and diaries include those of George Higginson, *Seventy-one Years of a Guardsman's Life* (1916); John Richard Hume, *Reminiscences of the Crimean Campaign with the Fifty-fifth Regiment* (1894); Frederick Robinson, *Diary of the Crimean War* (1856); and Humphry Sandwith, *A Narrative of the Siege of Kars* (1856). Many Russian, Sardinian, and French soldiers also wrote memoirs, but their works have not been translated into English. Due to the low literacy rate among the Turkish troops, few of their firsthand accounts exist. All of the memoirs reflect the age in which they were written, conveying the attitudes, beliefs, and prejudices of the 1850's and omitting certain elements that a modern reader would expect from accounts of contemporary warfare. For instance, because it was not fashionable to discuss emotions, particularly those experienced during battle, the authors describing their Crimean War experiences rarely discuss topics such as combat fatigue.

In addition to the various memoirs, there were travel accounts written by people with firsthand views of the Crimean War. These books were not necessarily written by regular soldiers or even by military personnel. Among the most useful is George Palmer Evelyn's *A Diary of the Crimea* (1954), which describes the role he played as a British mercenary in the Crimean War. Evelyn's account is particularly informative about the layout of the battlefields. Sir Henry Clifford's *Henry Clifford, VC: His Letters and Sketches from the Crimea* (1956) provides another firsthand account of the war, focusing on the period from September 18, 1854, to April 18, 1856. George B. McClellan's *The Armies of Europe Comprising Descriptions in Detail of the Military Systems of England, France, Russia, Prussia, Austria, and Sardinia: Adapting Their Advantages to All Arms of the United States Service and Embodying the Report of Observations in Europe During the Crimean War, As Military Commissioner from the United States Government, 1855-1856* (1861) provides a great deal of information about the organizations of the armies of most combatants in the Crimean War. Drawings and charts illustrate the information.

Letters Home from the Crimea (1999) is a collection of letters by Temple Goodman, a cavalryman who saw action in the Battle of Balaclava as well as the Siege of Sevastopol. Other published collections of letters include *"Little Hodge": Being Extracts from the Diaries and Letters of Lt.-Colonel Edward Cooper Hodge Written During the Crimean War, 1854-1856* (1971), written by Edward Cooper Hodge and edited by George Paget, the marquess of Anglesey; *Letters from the Army in the Crimea, Written During the Years 1854, 1855, and 1856* (1857), by Sir Anthony Coningham Sterling; *Life, Letters, and Diaries of Lieutenant-General Sir Gerald Graham with Portraits, Plans, and His Principal Despatches* (1901), by R. H. Vetch; and *Crimean Diary and Letters of Lieutentant-General Sir Charles Ash Windham, K.C.B., with Observations upon his Services During the Indian Mutiny* (1897), by Sir C. A. Windham.

Finally, special mention should be made of Leo Tolstoy's (1828-1910) fictional account of the Siege of Sevastopol, entitled *Sevastopolskiy rasskazy* (1855-1856; *Sebastopol*, 1887), as well as his published diaries covering the years of the Crimean War. As a young man, Tolstoy served as an artillery officer during the war and was stationed in Sevastopol at the time of the siege. His work is more readily available than many of the other primary sources discussed above and provides a Russian view of the war.

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Alison Rowley

The American Civil War

Dates: 1861-1865

Political Considerations

Long considered a watershed in American history, the American Civil War (1861-1865) was also a turning point in the execution of warfare. Although it did not begin as a radically new kind of war, this conflict developed into the first total modern war, in which farmers, artisans, and businessmen played as important a role as soldiers and sailors. It was the first time that a nation, having passed through the Industrial Revolution, put to large-scale military use new scientific discoveries and modern technological advances. Breech-loading rifles replaced smoothbore muskets, ironclads replaced wooden ships, and the telegraph replaced dispatch bearers. Military leaders made use of such new weapons as land and naval mines, machine guns, armored railroad cars, submarines, and aerial reconnaissance from anchored balloons. The American Civil War was the first conflict to be extensively photographed, the first to combine weapons technologies with mass production, and the first to transport large numbers of men and equipment over long distances via railroad.

The Civil War was rooted in the political paradoxes of the American Revolution (1775-1783), which had been a civil war as well as a war for independence. The American Revolution created the world's leading democracy, which was also a slave-based republic. Founding fathers such as George Washington (1732-1799) and Thomas Jefferson (1743-1826) established a union of states in which white liberty and black slavery coexisted. In the decades following the Revolution, Northern states instituted programs of emancipation, whereas Southern states, spurred by the productivity of the cotton gin and the demands of European textile factories for raw cotton, promoted the expansion of slavery.

According to many scholars, the increasing political, economic, and cultural tensions between Northern and Southern states made violent conflict between these antagonistic civilizations inevitable. Others see the Civil War as a constitutional or moral struggle, pitting libertarians against abolitionists. Still others see the crisis in terms of technological history. The Northern business class, friendly toward the technology that had made it wealthy and powerful, was hostile toward a Southern plutocracy wedded to an outdated agricultural society that resisted industrialization.

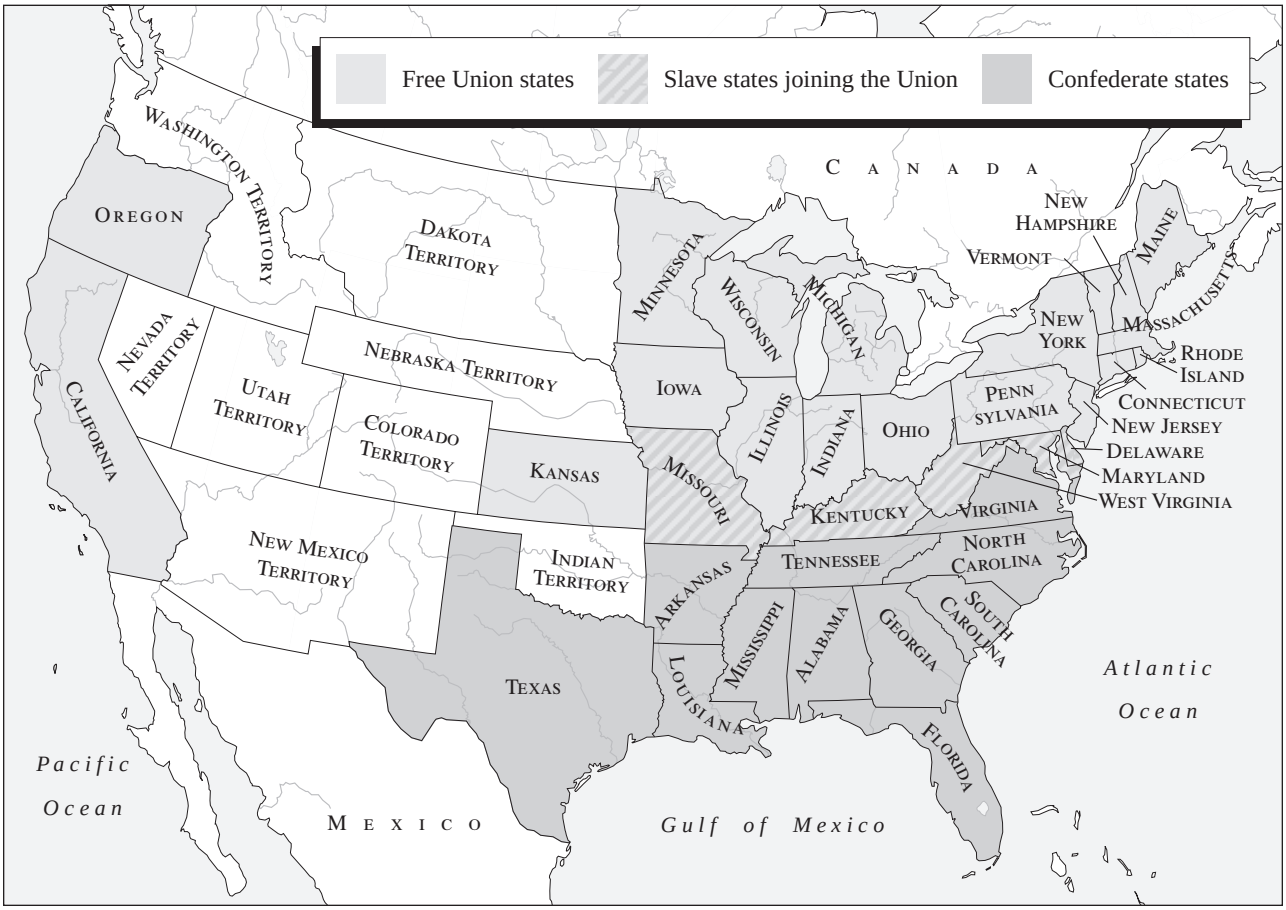
Although the war was ultimately decided by both military and technological achievements as well as by industrial and agricultural production, the political context influencing these developments was also important. In terms of international politics, both the North and South had strong ties of economic interdependence with European countries. For example, both Britain and France relied on raw cotton from the South to keep their textile mills productive, but these countries also had extensive investments in Northern land and railroads. In terms of domestic politics, the North and South, though claiming to be equally dedicated to the principles of the Declaration of Independence and the United States Constitution, had significant political differences that would influence military developments. The Confederate leaders may have seen themselves as the true heirs to the founding fathers of the United States, but the South's material and military weaknesses forced Confederate president Jefferson Davis (1808-1889) to reduce the rights of the seceded states in order to expand the power of his central government. For example, he forced through the Confederate Congress laws that resulted in the continent's first draft, the impressment of goods and labor, and the suspension of certain civil and economic liberties—all to help secure the new republic.

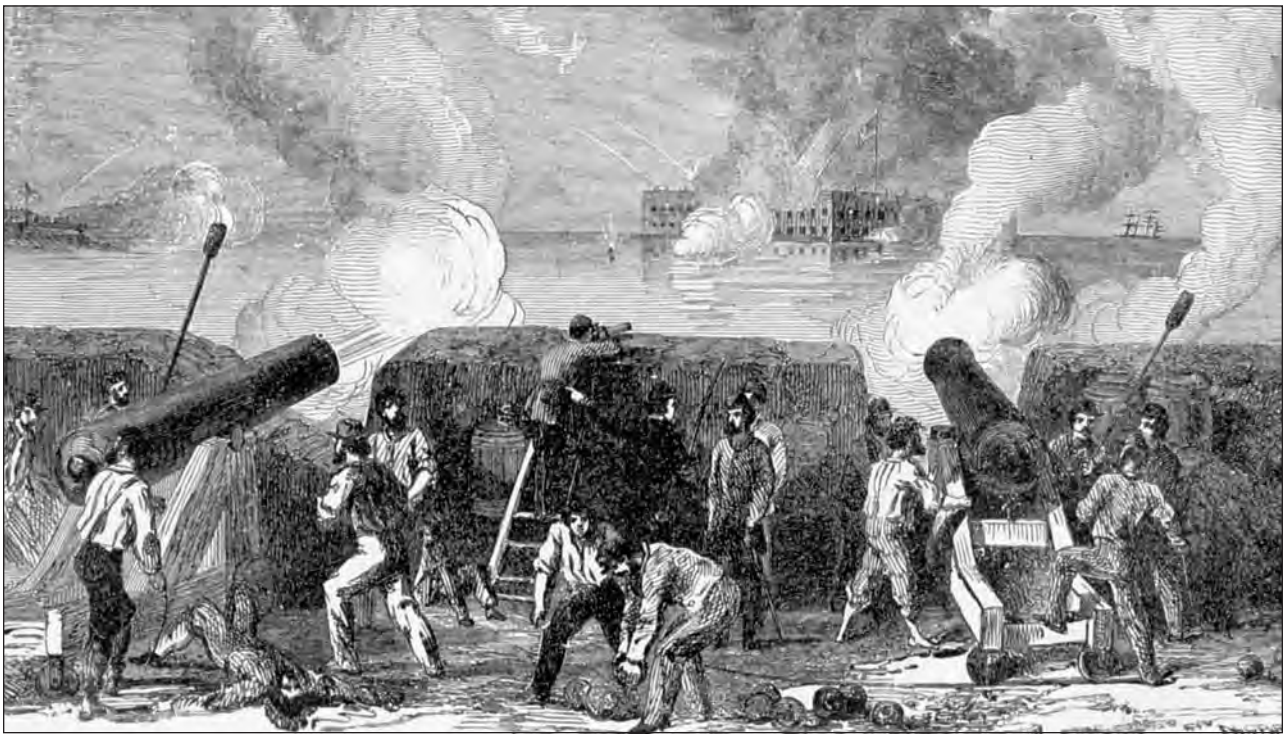
For Northerners, the relative unanimity that followed the outbreak of hostilities in 1861 quickly dis-

solved as leaders debated a series of controversial war measures, including conscription and emancipation. The military became enmeshed in politics when soldiers were required to capture and imprison influential "Copperheads," Northerners who sympathized with Southern secession. Following the instructions of Republican politicians, some state militia arrested draft dodgers and dissenting newspaper editors. Particularly troublesome to many was the brutal suppression of the 1863 Irish-immigrant riots against the draft in New York City. Because the wealthy could buy substitutes to serve in their place, many less advantaged Irish felt that the federal government was failing to live up to its egalitarian ideals.

President Abraham Lincoln (1809-1865) did try to engage an important group of Americans in the war effort when, in March, 1863, he signed an Act of Congress creating the National Academy of Sciences (NAS). The Academy's charter required its members, whenever called upon by government agencies, to investigate and report on any subject of science or technology. During its first year and a half the NAS had committees studying such important military matters as magnetic deviation on iron ships, the protection of iron vessels from corrosion, the preparation of accurate wind and current charts, and the development of efficient steam engines. Although the NAS did much to encourage the invention and production of weapons that amplified the abilities of Northern armies to inflict damage on Southern soldiers, it failed to improve significantly medical techniques and facilities, with the result that disease

CONFEDERATE AND UNION TERRITORIES





Gay Brothers and Company

Confederate forces fire on Fort Sumter in 1861.

killed twice as many Union soldiers as Confederate weapons did.

The Civil War began with the attack on Fort Sumter in April, 1861. At this time, the Union possessed overwhelming superiority in both manpower and material resources needed to conduct war in an industrial age. Although neither the South nor the North had made any special preparations for a prolonged war, Northerners had many advantages over Southerners, which politicians tried to turn into the means of victory. The North, exclusive of the border and far western states, surpassed the South in population, with 18.5 million Northerners to 5.5 million Southern whites (there were also 3.5 million black slaves). The disproportion in industrial strength was even greater: the North had more than 100,000 factories with more than one million workers, whereas the South had approximately 20,600 factories with only 111,000 workers. Northern industrial output was valued at $1.5 billion; Southern output was valued at $155 million. Because the Civil War would be the first modern war, iron and steel would become the basic material for the production of munitions, railroads, bridges, and other equipment and structures. The total output of pig iron in the United States in 1860 was about 860,000 tons, of which the South produced only 26,000 tons, or 3 percent. Pennsylvania alone manufactured 560,000 tons of iron, which helps to explain Southern raids into this state. In 1860 there were 30,500 miles of railroad track in the United States, 72 percent of which lay in the North.

In sum, political decisions and developments affecting technology, industry, and the military helped shape the course of the Civil War and its resolution. Although the South was outmanned, outgunned, and outproduced by the North, a case can be made that the Confederacy's initial success and ultimate failure owed much to such intangibles as moral and religious concerns and civilian and military morale. Some Southern sympathizers claimed that the South had waged this war in defense of an aristocratic republic, and only the overwhelming force of Northern num-

TURNING POINTS

Apr. 12, 1861	Confederate forces attack Fort Sumter, South Carolina, initiating the Civil War.
Mar. 9, 1862	The Battle of Hampton Roads between the ironclads USS *Monitor* and CSS *Virginia* revolutionizes naval warfare.
May 5, 1862	Confederate General Gabriel J. Rains uses the first land mines to cover his retreat from Williamsburg, Virginia.
May 31-June 1, 1862	At the Battle of Seven Pines (Fair Oaks), Virginia, a machine gun is used for the first time in war.
Feb. 17, 1864	The Confederate submarine CSS *H. L. Hunley* becomes the first underwater vessel to sink an enemy ship, the USS *Housatonic*, near Charleston, South Carolina.

bers and arms had defeated it. Certain Northern sympathizers saw the war primarily as a moral crusade against slavery. Lincoln himself believed that he was using the men, matériel, and weapons at his disposal to save the Union. Even his Emancipation Proclamation, which became effective January 1, 1863, actually freed no slaves but declared that only slaves in rebellious states would be freed. After the war, emancipation reshaped American race relations, but during the war Lincoln's political actions resulted in increased federal power over civilians and the military.

The significance of the Civil War for the military has been a central concern to scholars. Some have emphasized the role of traditional weapons and techniques during most of the war, whereas others have located the center of this war's modernity in its evolution into a total war. Both of these views came under criticism in the 1980's, when some scholars argued that technology, in the form of new rifles and other weapons, actually made little difference on small-scale Civil War battlefields. Others questioned the notion of the Civil War as the first total war, claiming that military leaders rarely destroyed civilian lives and property in any systematic way. During the 1990's there were some comparisons with the War of the Triple Alliance in South America (1864-1870) where the Paraguayans fought even more bitterly than the Confederates in the U.S. Civil War, leaving their country even more devastated than the southern states. Similarly that conflict was seen as a contest between the martial spirit of one country against the industrial power of its enemies. These interpretations and reinterpretations of a war that has been so extensively studied and so charged with moral, religious, and political meaning are likely to continue.

MILITARY GOALS AND ACHIEVEMENTS

The military goals of both the Confederacy and the Union can be simply stated. The South was fighting for independence, the North for restoration of the Union. The Confederacy was thus forced into a war whose ultimate goal was the defense of its own territory. Although it did occasionally expand the war into the enemy's territory in the west and north, that was a matter of operational strategy rather than national policy. The North's goals were different from those of the South and far more difficult to accomplish. In order to restore the Union, Lincoln had to destroy the Confederacy. To force a new country of several million people to cease to exist is a much more daunting task than to protect such a country from external attacks. At the start of the war, slavery's abolition was not one of the North's military goals. Both Lincoln and the Congress were explicit in asserting that they wanted to restore the Union without interfering with slavery.

Military aims guided military achievements. To preserve its independence, the Confederacy built an army but did not want to use it: It wanted only to be left alone. In contrast the North had to be aggressive. Unless Lincoln could compel the rebellious states to return to the Union, he would lose the war. The Union was initially successful in achieving some of its goals. With the aid of military force it was able to keep the border states of Maryland, Missouri, and Kentucky in the Union, but because of the small number of Union sympathizers in the eleven seceded

states, Northern armies eventually had to invade the Confederacy's territory to destroy its armies and government.

Despite the North's manpower and material advantages, the initial military achievements in the Civil War were primarily Southern. The Confederates won several early battles, helped by their excellent generals and the introduction of new weapons. After the Battle of Antietam in September of 1862, Union leaders shifted to a defensive strategy in the East, accepting a temporary stalemate in Virginia, but became more aggressive in the West. By 1863 the Union had achieved control of the Mississippi River, effectively dividing the Confederacy. Confederate general Robert E. Lee (1807-1870) then embarked on an invasion of the North by crossing into Pennsylvania. After his defeat at Gettysburg (July 1-3, 1863), however, the rebel army had to return to Virginia. Whether there might have been a peace agreement had Lee won the battle, is now hotly debated. The Union achieved a second major military goal in 1863 with its occupation of East Tennessee. In early 1864 Ulysses S. Grant (1822-1885) was promoted to general-in-chief of the Union forces, and he embarked on a war of attrition to subdue Lee's army. General William Tecumseh Sherman (1820-1891), Grant's replacement in the West, was able to capture Atlanta in the summer of 1864 and then march through Georgia to the sea, effectively splitting the Confederacy into still smaller pieces. By April 9, 1865, the war was over.

The benefit of spies to both sides has now become a new field of research in itself, partly sparked by the major role ascribed to Henry Thomas Harrison (1832-1923) at Gettysburg in the 1993 film on the battle. Much recent scholarship has also been devoted to the nature of the possibility of foreign involvement in the war. Certainly the war in Mexico between Emperor Maximilian and the supporters of Bentio Juárez meant that the French were, for a while at any rate, distracted from the American Civil War. The British, however, had divided loyalties and certainly viewed the naval aspect of the war with contentment. Although initially an attempt by the Confederacy to internationalize the war, the net result of this aspect of the war was that Confederate raiders destroyed much of the U.S. merchant navy, leaving Britain supreme in trade until 1914. That the British later had to pay compensation for their help (unwitting or otherwise) to the South shows at least a level of complicity.

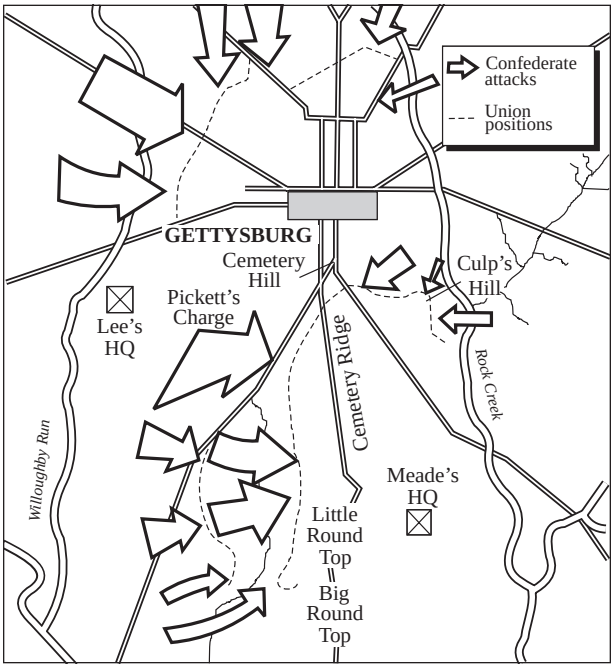
WEAPONS, UNIFORMS, AND ARMOR

Despite its reputation as the first modern war, the Civil War was actually fought with both old and new weapons. During the war's early years many soldiers were issued old flintlock or smoothbore muskets. In 1860 American arsenals held more than 500,000 small arms, and when the war started, 135,000 of these were confiscated by the South. Only 10,000 of these guns, however, were modern rifles. The two great government armories were at Harpers Ferry, Virginia, and Springfield, Massachusetts. The North

Library of Congress

The battlefield at Gettysburg yields up carnage, 1863.

GETTYSBURG, 1863



and South exchanged control of Harpers Ferry numerous times during the conflict, and so its production of weapons was hampered, whereas the Springfield armory was able to produce about two million rifles during the four years of the war. These Springfield rifles, single-shot muzzle-loaders, became the most widely used weapon of the U.S. Army.

The Confederacy found weapons to be in short supply, particularly early in the war. In 1861 the weapons collected from citizens and confiscated from federal armories were insufficient to arm the increasing numbers of recruits. The South's output of small arms measured in the hundreds rather than the thousands, hence the need for European purchases. However, lack of funds, competition from the North, and difficulty of shipping through the Northern blockade handicapped the South's attempts to acquire arms for its troops. Only 50,000 arms had reached the South from Europe by August of 1862. The situation improved later in the war, and by the war's end the South's Ordnance Bureau had imported some 330,000 arms, mostly Enfield rifles, through the blockade.

The North was in a much better position than the South to arm its troops. The federal government was able to acquire arms from several private armories, such as the Colt Arms Works at Hartford, Connecticut, in addition to the arsenal at Springfield. The North also possessed supplies of saltpeter for gunpowder, lead for cartridges, and copper for percussion caps. Furthermore, three cannon factories were located in the North: at South Boston, Massachusetts; West Point, New York; and Pittsburgh, Pennsylvania.

The war created a demand for improved and efficient weapons, which were supplied by American inventors. The basic infantry weapon of both North and South was the rifled musket, and although it resembled the muskets of earlier wars, it actually incorporated several modifications that transformed its performance. Smoothbore muskets had a killing range of about 50 yards, whereas rifled muskets could kill at 500 yards. Most of these rifles were muzzle-loaders, but a French officer, Claude-Étienne Minié Claude-Étienne Minié (1804-1879), had devised a bullet with a hollowed base that allowed it to expand when fired, forming a tight fit as it left the barrel. This Minié ball, so named despite its cylindrical shape, vastly increased the range and accuracy of the new rifled muskets. The Minié ball and rifled musket were responsible for over 80 percent of battlefield casualties during the American Civil War.

The South produced about 600,000 rifles during the war; the North imported about 400,000 and manufactured another 1,700,000. Although a single-shot, breech-loading rifle had been developed at the Harpers Ferry armory just before the war, large numbers of these breech-loading weapons became available only late in the war. Repeating rifles, used mainly by the cavalry, were also developed. Percussion caps, which were reliable in all kinds of weather, improved the rate of fire and added to the range and accuracy of the rifles. These improved weapons had the effect of extending the killing zone in front of a line of soldiers.

Just as small arms were at a transitional stage at the beginning of the war, so, too, was artillery. Cannons were both smoothbore and rifled, with rifled cannon barrels becoming more widely adopted. Dur-

ing the four years of the conflict, nearly one-half of the Union cannons, but only one-third of Confederate cannons, were rifled. Rifled barrels gave projectiles greater distance, velocity, and accuracy. Cannons were muzzle-loaded with various projectiles, including solid shot and explosive shells such as canisters. These canisters, which killed more men than all other artillery rounds combined, were metallic cylinders packed with musket balls, nails, or metal scraps that, when explosively propelled from cannons, scattered their lethal pellets over a wide area.

At the start of the war, the U.S. Army had about 4,200 cannons, most of which were heavy pieces in coastal fortifications; only 167 were field artillery. The Union army used 7,892 cannons in the war, compared with more than four million small firearms. These data imply that the Civil War was basically an infantry war, in which artillery played a supporting role. Numbers can be deceiving, however; artillery,

MAJOR SITES IN THE CIVIL WAR, 1861-1865

when properly used, was often highly effective. Union artillery was superior to its Confederate counterpart in terms of numbers, quality, maintenance, and skilled use.

If hit in the head or chest by bullets or shrapnel, infantry soldiers often died. The Minié ball shattered bones, shredded tendons, and mangled major organs beyond repair. Arm and leg wounds frequently required amputation. Soldiers wounded but not killed on the battlefield frequently succumbed to infections in camp hospitals. On the Northern side, the total medical casualties recorded from May 1, 1861, to June 30, 1866, were 6,454,834. Of this number, at least 195,627 died. If the 425,274 cases due to battle wounds and injuries (and the subsequent 38,115 deaths) are subtracted from the total medical casualties, the remainder, constituting the diseases, numbered 6,029,560 cases, and 157,512 deaths. Southern casualties exhibited a similar pattern, but Confederate medical data are so incomplete and disordered that it is impossible to be specific. With more research into the developments of military medicine during the war, the large numbers of casualties in battles and elsewhere has been better able to be analyzed.

Because of its weaknesses in small arms, artillery, and medical care, the South had greater incentives than the North to develop new weapons. For example, early in the war a Confederate general introduced land mines, and a Confederate captain invented a machine gun. The first use of land mines in war took place during a delaying action that the Confederate army fought near Williamsburg, Virginia, on May 5, 1862. To cover his withdrawal to Richmond, General Gabriel J. Rains ordered 10-inch shells to be buried in the road, with strings attached to the fuses. Union cavalry set off these buried shells, causing casualties and panic.

A breech-loading machine gun, invented by Confederate captain R. S. Williams, was first used at the Battle of Seven Pines, or Fair Oaks (May 31-June 1, 1862). This unwieldy weapon, weighing 275 pounds, with an ammunition box of 600 pounds, was pulled by one horse and was operated by three men. Operators turned a crank that fed bullets from a hopper into the breech, and the gun fired these at the rate of twenty to forty per minute, with a range of 2,000 yards. When, in October of 1863, the Confederates brought six of these machine guns into action at the Battle of Blue Springs, Tennessee, the torrent of bullets caused mass confusion in the opposing Union army. However, the Williams machine guns were prone to malfunction and saw little action in the remainder of the war. The same was true of a similar machine gun invented in 1862 by Dr. Richard Gatling (1818-1903) of Indiana. The multibarreled Gatling gun could fire 250 shots a minute, but its unreliability meant that it was used only minimally by the North, and there have even been suggestions that as it was being produced at Cincinnati, Ohio (the original drawings being lost in a fire), Gatling might have had mixed sympathies in the war, and the finished products could easily have been captured by the Confederate forces.

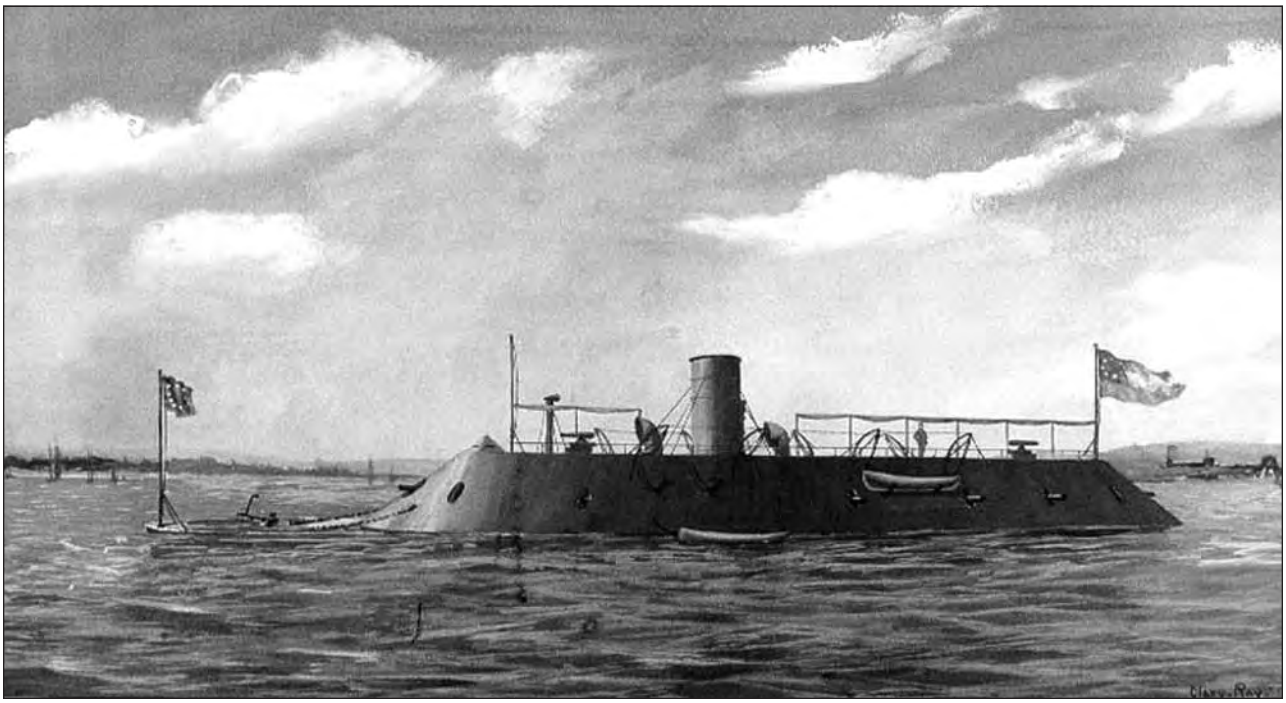
A new weapon that did have significant use in the Civil War was the ironclad. The ironclad's advent came at a time of rapid naval transition—from sail to steam, side-wheel to screw propeller, and thick wood sides to iron armor. The first Confederate ironclad, the CSS *Virginia*, quickly proved its effectiveness. This experimental craft was built from the scuttled USS *Merrimack*, which was raised, armored with two layers of thick iron plates, armed with six 9-inch guns, and fitted with a heavy cast-iron prow for ramming. The renamed *Virginia* was designed to break the Union blockade at Hampton Roads, Virginia, and on March 8, 1862, it sent four large Union warships to the bottom of the channel without sustaining any damage.

Union spies had alerted Northern officials to the construction of the CSS *Virginia*, and Secretary of the Navy Gideon Welles (1802-1878) engaged Captain John Ericsson (1803-1889), a brilliant engineer, to construct an ironclad in response to this Southern threat. The USS *Monitor*, which was less than one-third the size of the *Virginia*, had a distinctive revolving turret containing two 11-inch guns. (Some of its details were also published in the *Scientific American*.) On March 9, 1862, it confronted the *Virginia* in one of the most famous naval battles in history. For three hours, each ship fired at the other, neither able to inflict any serious damage on the other. The *Vir-*

ginia had shown that wooden ships were helpless when attacked by an ironclad, and now the *Monitor* had shown that an ironclad could neutralize another ironclad. Ironclads clearly represented the future of naval warfare, consequently dooming wooden navies. Within a week of the battle, Welles ordered six new ironclads, called "monitors" after their prototype. Many others followed, to be used on western rivers and to support the blockade of Southern ports.

Less successful than the ironclads was the submarine. Because Southern ports were desperate to break the blockade, private citizens contributed to financing the CSS *H. L. Hunley*, a nine-man underwater vessel designed to approach blockaders undetected and to sink them with explosives. On February 17, 1864, the *Hunley* was able to attach an explosive charge to the USS *Housatonic* by means of a long wooden spar. The explosion sent this 1,800-ton, 23-gun corvette to the bottom of the sea just outside the entrance to Charleston Harbor. However, the *Hunley* also sank, drowning its crew. Naval mines, which were used by both North and South, proved to be more effective than submarines in sinking enemy ships.

Uniforms, as well as weapons, evolved over the course of the Civil War. In the early months of the conflict, individual states provided uniforms, which led to a motley of styles and colors. For example, some Union soldiers wore uniforms patterned after those of the Zouaves, French colonial soldiers in Algeria: baggy red breeches and brief blue coats with yellow sashes. Some Union regiments were initially attired in gray, and some Confederate soldiers wore blue, leading to tragic confusion on early battlefields. The Confederate government soon adopted cadet gray as the official color for its uniforms, but it was never able to clothe its soldiers consistently. Confederate officers were expected to provide their own uniforms, and these often did not conform to the standards set by the War Department in 1861. Coats were of many different cuts and materials, but after the first year of the war, they were generally a shade of gray. Not until 1862 were Union soldiers consistently



Courtesy of the U.S. Navy Art Collection, Washington, D.C.

A new weapon during the Civil War was the ironclad gunboat, such as the CSS Virginia. *The ironclad arrived at a time of a rapid naval transition from sail to steam and from thick wood sides to iron armor.*

uniformed in blue. As with weapons, the North had an advantage over the South, because their uniforms were made by the newly invented sewing machine, which had helped create a highly developed Northern clothing industry. Northern textile mills were converted to war production, and the factories of Lowell and Lawrence, Massachusetts, were soon turning out thousands of pairs of blue trousers and dark blue fatigue jackets.

Underneath their uniforms many Union volunteers wore body armor to protect themselves against enemy bullets. At least three New England firms manufactured and aggressively marketed the "soldier's bulletproof vest." This vest, containing large pockets into which steel plates were inserted, weighed 3.5 pounds. In some regiments more than half the soldiers used these steel-plated vests, but, as the war progressed, enthusiasm for this uncomfortable body armor waned, especially when enemy sharpshooters chose to aim at soldiers' heads instead of their chests. These bulletproof vests were far less common among Confederate soldiers, because steel was in very short supply in the South.

MILITARY ORGANIZATION

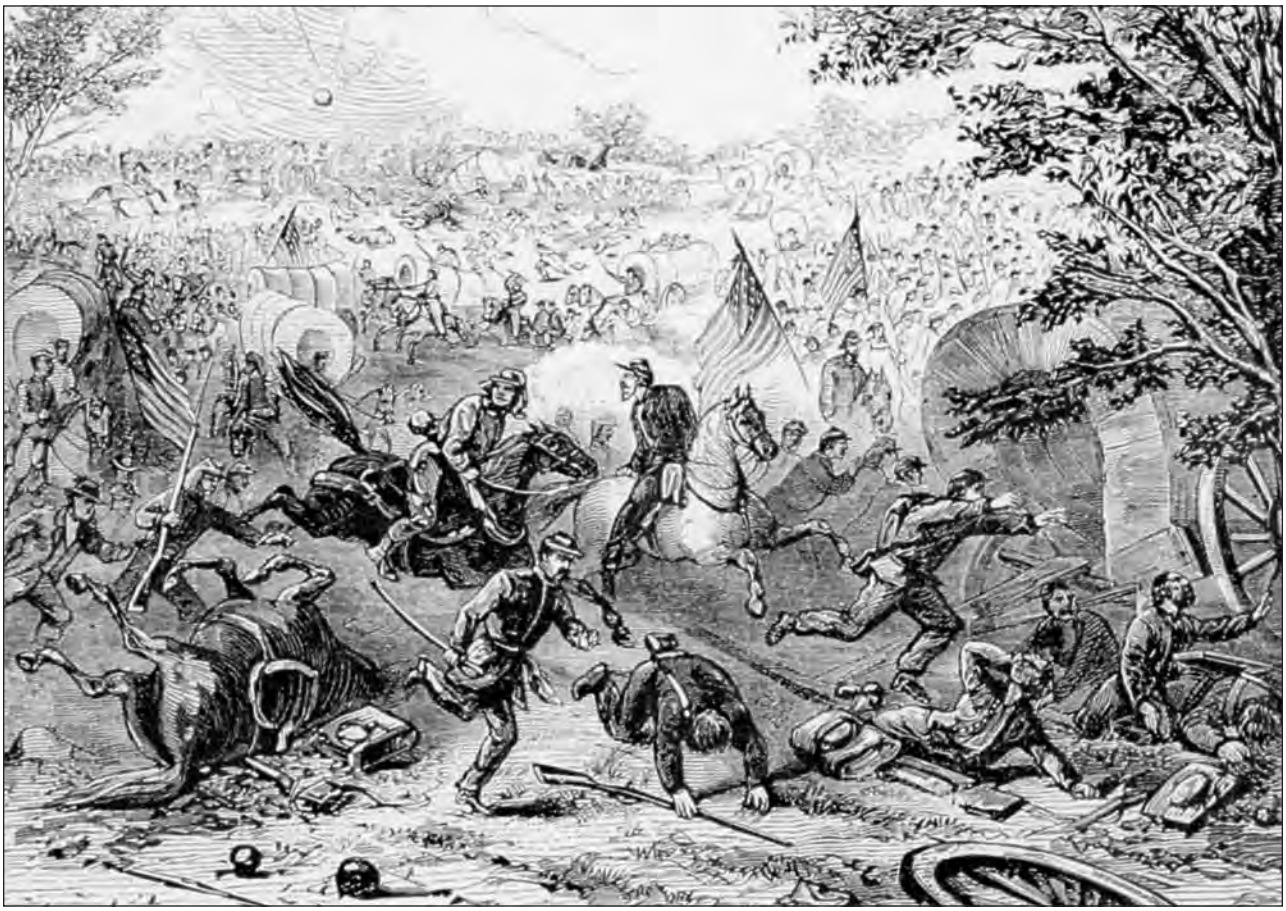
Because many officers of both the Union and Confederate armies had been trained at West Point, both armies were similar in military organization. The regiment was the basic unit. It was led by a colonel, with a lieutenant colonel as second and a major as third in command. A regiment, which initially had about 1,000 men, was divided into 10 companies, each officered by a captain and 2 lieutenants. There were three kinds of regiments: infantry, artillery, and cavalry. Infantry regiments were the nucleus of both the Union and Confederate armies. Artillery regiments were of two basic kinds: heavy artillery positioned in fortifications and light or field artillery attached to mobile armies. Cavalry regiments were organized in the same way as infantry, but the South expected its cavalrymen to provide their own horses, whereas the Union supplied its troops with horses. During the Civil War the Union raised 2,046 regiments: 1,696 infantry, 272 cavalry, and 78 artillery. The number of regiments in the Confederacy is unknown because of the loss of relevant records, but estimates range from 750 to 1,000.

Military regiments were organized into increasingly larger units: brigades, divisions, corps, and armies, each commanded by a brigadier or major general. Union armies were normally named after rivers in the area of their command (for example, the Army of the Potomac), whereas Confederate armies often took their names from a state or part of a state (for example, the Army of Northern Virginia). Although regimental organization and numbers varied from army to army, time to time, and place to place, overall structures tended to remain constant. As the war continued, however, both the North and the South failed to maintain the strengths of existing regiments in the face of attrition due to casualties, deaths, and desertions. States preferred to set up new regiments rather than re-man old ones. Thus, as the war proceeded, the number of regiments became a very unreliable guide to the actual strength of armies.

DOCTRINE, STRATEGY, AND TACTICS

Throughout history, soldiers have performed according to their and their leaders' understanding of the nature of war itself. This understanding, which is an important component of military doctrine, is concerned with the beliefs that drive soldiers to fight and the methods by which they actually fight. These doctrines are also related to the means by which leaders establish military standards and how, in battle, they determine the balance between offense and defense, individual and group action, and traditional and modern technologies. Theoretically, a nation's founding principles help to shape its military doctrines, which, in turn, influence its military strategies and tactics. Practically, military doctrines determine how wars are fought.

At the start of the Civil War, the military doctrines of both North and South were guided by French military ideas about the organization and use of large numbers of soldiers. For Napoleon, a military campaign was an orderly sequence of informed decisions leading to a clear objective. American soldiers of



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Union troops retreat at the First Battle of Bull Run (First Manassas) in 1861.

both Northern and Southern armies entered the Civil War prepared to fight a version of war more than fifty years old. However, technological progress modified military doctrines, even though conservative leaders often fought a new war with the techniques from an old one. Some Civil War officers were aware of the disjunction between old doctrines and new realities. For example, they realized the folly of lines of troops advancing into areas enfiladed by highly accurate small-arms and artillery fire. Some officers believed that the only way to conserve their troops during such an assault was to disperse them, even though this meant surrendering strict control of troop movements. This tactic generated controversy, since tight formations caused heavy casualties, but dispersed formations led to dangerously purposeless actions as seen with the British and French forces in the Crimean War in the previous decade.

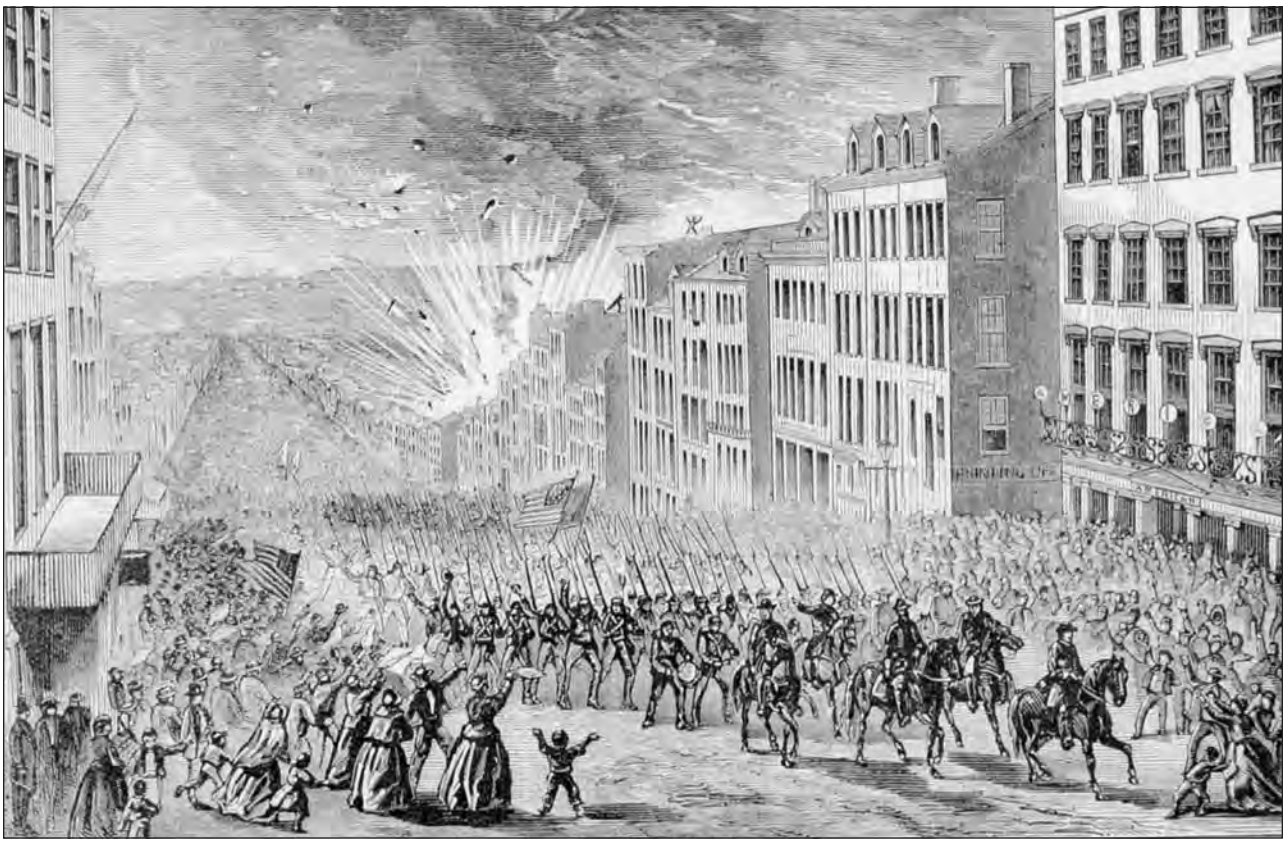
Like military doctrine, strategy has evolved in meaning over time. Initially strategy meant the military leader's art of war, but by the American Civil War its sense had become generalized to mean the science of war, or the use of reason to achieve national goals by military means. For example, the overall grand strategy of the Union was to reconquer and reoccupy all original U.S. territory and to restore federal authority throughout. The grand strategy of the Confederacy was to defend its political independence and territorial integrity.

The Northern strategy of preserving the Union at first seemed to require a military strategy of limited war: first suppress the insurrection in the eleven se-

ceded states, then arrest Confederate leaders, and finally put Unionists in control. On May 3, 1861, General-in-Chief Winfield Scott (1786-1866) presented an offensive plan to bring the rebels to accept these terms with as little bloodshed as possible. He proposed economically strangling the Confederacy by blockading its ocean and river ports and gaining military control of the border states. Several newspapers contemptuously called this the Anaconda Plan, because it would take an interminably long time for the strangulation to become effective. Meanwhile, public opinion was clamoring for an immediate invasion to crush the rebellion.

By 1862 Union military strategy had evolved, under pressure from public opinion and President Lincoln, to a policy of conquest of Confederate territory. This new plan succeeded in Tennessee and the lower Mississippi Valley but was stalemated by Lee's victories in the East. Consequently, Northern military strategy changed yet again, in 1863, to a conviction that the Confederate armies would have to be destroyed. However, despite a significant Northern victory at Gettysburg, Lee's army survived and the Confederacy continued to resist. Thus, by 1864, Union strategists realized that it was inadequate to conquer territory and cripple armies. They had to destroy the capacity of the Southern people to wage war. Sherman's march of conquest and destruction through Georgia and South Carolina in 1864 contributed significantly to weakening the will of Southerners to continue to fight. To many, the Civil War had become, by 1865, a total war, and this fact finally led to the Confederacy's capitulation.

Although the Confederacy's national strategy of preserving its independence remained constant throughout the four years of the war, the military strat-



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Richmond falls to Union troops in April, 1865; the war is effectively over.

egies devised to achieve this goal continually shifted. Initially Confederate leaders sparsely spread their troops around the circumference of their new country to repel potential invaders, but this tactic proved to be an unwise use of the South's limited manpower. Another unwise military strategy was the political decision to move the Confederacy's capital from Montgomery, Alabama, to Richmond, Virginia, about 100 miles from Washington, D.C. This move turned northern Virginia into one of the war's principal battlegrounds. The concentration of Confederate forces in the East weakened the West, allowing Union forces to gain control of the Mississippi River and divide the Confederacy.

Library of Congress

Sherman's troops pulling up railroad tracks in Atlanta, Georgia.

However, the Confederacy proved more adept than the Union expected at countering the Anaconda Plan; Southern blockade runners were successful in bringing much-needed military supplies from Europe. Lee was also successful in convincing Confederate leaders to modify the "dispersed defensive" strategy into an "offensive-defensive" strategy. This meant that, although the national strategy remained the protection of the Confederacy, this goal could sometimes best be achieved by attacking the enemy in Confederate territory or by attacking the enemy's territory itself. Lee thus sought to break the Union's will to reunite the country by defeating its armies. However, in the end Lee's army could not withstand the unremitting pressure of the large, well-armed, and amply supplied Union armies.

The strategies of North and South were implemented by various tactics. In military terminology, tactics is the management of soldiers on a battlefield. The tactical systems of the Civil War were modifications of deployments in eighteenth century battles. Under the traditional system, soldiers in several long lines advanced toward enemy positions while exchanging controlled volleys. This continued until either the offensive or defensive lines broke down. Although military leaders on both sides continued to use this old tactic, the long range and high accuracy of such new weapons as rifled muskets and cannons, and, later, rapid-fire breechloaders, made its use extremely costly on the attackers. As the war evolved, some commanders developed new tactics that allowed infantry formations to be flexible, even to the point of granting individual soldiers free-handed initiative to achieve their mission.

Improved weapons also brought about the end of the classical cavalry charge, because Minié bullets and raking artillery fire easily downed horses and cavalrymen long before they could reach enemy positions. In the latter part of the war, military leaders used cavalry strictly for reconnaissance and the capture of critical road junctions. Because of the failures of traditional assault tactics, both Union and Confederate leaders used, during the campaigns of 1864 and 1865, a new technique that came to be called trench warfare, in which defensive lines were protected by forts with artillery, pits with riflemen, and elaborate breastworks of logs and dirt piles.

The Civil War was also the first American conflict in which the tactic of the rapid movement of men and matériel by railroad played a major role. However,

during the initial phases of the war, railroads were used primarily to transport supplies, not troops, although reinforcements did arrive at the First Battle of Bull Run by railroad during the course of the fighting, changing the outcome. By the summer of 1862, when thousands of Union troops were transported to Washington, D.C., by rail to prevent Lee's army from capturing the capital, the advantages of train over foot and horse transport became obvious. The South, too, quickly realized the military significance of railroads, and Southern raiders destroyed Northern tracks, bridges, and locomotives. These tactics led to the creation of a special corps in the Union army to repair torn-up tracks and destroyed bridges. This corps used standardized, interchangeable parts and made a science of track and bridge reconstruction. This construction corps was also a destruction corps, because its men developed new ways of destroying enemy rails and bridges. For example, they both bent and twisted heated rails to render them irreparable and useless. The armored railroad car was yet another contribution to military transport technology that made its first appearance during the Civil War. These bulletproof cars were used to patrol important railroads, protecting key supply and troop-transport lines for Union armies.

Finally, naval tactics, like land tactics, experienced radical changes during the Civil War. Before the war naval tactics had involved the effective detection of enemy ships and the countermeasures to neutralize or destroy them. Guns were a fleet's decisive weapons, and a tightly spaced line of ships was its most advantageous formation. The tactical aim was to bring the maximum amount of firepower to bear on the enemy. The Battle of Hampton Roads changed all this. In terms of strategy, the mission of the *Monitor* was to protect the Union warships that had not yet been destroyed by the *Virginia*. Because the *Monitor* did this, the battle was a strategic victory for the North. From a tactical viewpoint, both the *Monitor* and the *Virginia* left the battle in almost the same condition as when they entered it, with the *Monitor* a bit more damaged than the *Virginia*. As for how the battle affected the strategic situation in Virginia, the battle was also a draw, because the Union still controlled Hampton Roads while the Confederates held the rivers.

Like this battle between the *Monitor* and *Virginia*, the military doctrines, strategies, and tactics of the Civil War helped to change the nature of warfare throughout the world. The First Battle of Bull Run (1861) would have been familiar in its weapons and tactics to a veteran of the Napoleonic Wars (1793-1815), whereas the trench warfare around Petersburg (1864-1865) and Richmond (1865) was a harbinger of World War I. Furthermore, Sherman's march through Georgia was an early intimation of the Nazi Blitzkrieg of World War II. The North's emphasis on outproducing rather than outfighting the South also had a profound influence on future strategic and tactical military thinking. Thus, in its weapons, strategies, and tactics, the Civil War may have begun with an eye to the past, but it ended as a portent of the future.

CONTEMPORARY SOURCES

The American Civil War has generated an immense and ongoing literature, with new books and articles are constantly appearing. An extensive introduction to the first hundred years of these writings is provided by the two-volume *Civil War Books: A Critical Bibliography* (1967-1969), edited by Allan Nevins, James I. Robertson, and Bell I. Wiley. A good way to keep up with new books and articles is through the bibliographies published annually by such periodicals as *Civil War History*.

Several multivolume histories of the Civil War provide excellent coverage of the conflict as well as a critical selection of primary and secondary sources. Alan Nevins's eight-volume *The Ordeal of the Union* (1947-1971) is both scholarly and significant, with the final four volumes emphasizing the war itself, largely from a Northern social, political, and military perspective. A history that emphasizes the Southern point of view is Shelby Foote's three-volume *The Civil*

War: A Narrative (1958-1974). An older account by an esteemed historian is Bruce Catton's three-volume *The Centennial History of the Civil War* (1961-1965). A short version of Catton's story, updated by the Pulitzer Prize-winning author James M. McPherson, is *The American Heritage New History of the Civil War* (New York: Viking, 1996), which includes an extensive set of maps, photographs, paintings, sketches, and other illustrative material. James M. McPherson's *Battle Cry of Freedom: The Civil War Era* (1988) is widely regarded as the best single-volume history of the war.

Official records of the Civil War were collected and published at the turn of the century by the U.S. Army and the U.S. Navy, respectively, as *The War of the Rebellion: Official Records of the Union and Confederate Armies* (1882-1900) and *The War of the Rebellion: Official Records of the Union and Confederate Navies* (1894-1922). These vast works of correspondence and official reports are excellent sources for scholars, but two primary sources that are accessible to general readers are *Personal Memoirs of U. S. Grant* (1885) and *Memoirs of W. T. Sherman* (1891). These memoirs emphasize the Union point of view. Jefferson Davis's two-volume *The Rise and Fall of the Confederate Government* (1881) provides a Confederate point of view. For Lee's view of the war the best source is the classic biography by Douglas Southall Freeman, *Robert E. Lee* (1935-1942), but this work should be supplemented by such later assessments as Alan T. Nolan's *Lee Considered: General Robert E. Lee and Civil War History* (1991).

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Robert J. Paradowski

WARFARE IN THE AGE OF EXPANSION

Colonial Warfare

Dates: 1420-1857

Political Considerations

Significant political, economic, and cultural changes in Europe during the fifteenth and sixteenth centuries allowed for extensive European colonial expansion to Asia, Africa, and the Americas. The medieval order was in a state of collapse; the concept of Christendom, a Europe united by the force of Christianity, was giving way to the rise of humanism and secularism. As Christian Europe split into ideological factions, nation-states emerged. France, England, Spain, and, for a brief period, Portugal all developed extra-European colonies and extended their historic rivalries in armed conflicts overseas.

The development of nation-states paralleled the rise of capitalism. Characterized by the ownership of private property, the emphasis on competition and profit, and the institution of bank credit, capitalism contributed to the hostilities among nations when expressed in the variation of mercantilism. Mercantilism, which was not fully articulated until the late seventeenth century, advanced a static view of wealth: If one nation increases its reserves of gold and silver, the reserves of other nations must decrease. Because there was, essentially, a fixed amount of gold and silver in the world, there was a race to obtain as much as possible; this economic philosophy resulted in a perpetual state of economic warfare among the European states.

Another factor that contributed to the beginning of colonial warfare was the technological revolution that made possible the commercial revolution. Europeans had ships and navigational instrumentation that made possible the acquisition of colonial outposts; they also possessed more sophisticated weaponry than did the native populations that they encountered in their overseas expansions. It was not surprising that the earliest colonial wars were struggles between the English, French, Spanish, and Portuguese, given the proximity of these nations to the Atlantic Ocean. France and England previously had been involved in the Hundred Years' War (1337-1453), fought over opposing dynastic claims to territory in northwestern France. These two nations continued their national rivalry in the colonies throughout the colonial and imperial periods.

When Britain acquired the Cape Colony, cartoonist Linley Sambourne drew colonial administrator and financier Cecil Rhodes straddling the continent in a symbolic depiction of British power in Africa.

World Exploration in the Sixteenth Century

Under the leadership of Prince Henry the Navigator (1394-1460), Portugal during the 1420's was the first nation to establish colonial outposts in the Madeira and Azores islands. Henry recognized the capabilities of new navigational devices and sailing ships that were then being constructed. The early Portuguese penetration of coastal African and Indian Ocean locales was cut short by the emergence of Spain in 1492, when the kingdoms of Aragon and Castile combined to unite most of the Iberian Peninsula. In 1580, two years after an unsuccessful colonial war in Morocco, where the young Portuguese king was killed (the country briefly being ruled by his childless great-uncle), Portugal was incorporated into Spain for the next sixty years.

Throughout the sixteenth century, colonies in the Americas, Africa, and Asia were viewed as fiscal resources from which great wealth could be obtained. The native populations were viewed as pagans who should be Christianized; nonetheless, there was little if any sympathy for the native populations. The Europeans exploited the colonies and brought them into the network of the national policies and controversies. European wars, rivalries, and perceptions were also extended to the colonies.

Spain, the dominant colonial power in the sixteenth century, developed a global network of colonies in the Americas (Central and South America), Asia (the Philippine Islands), and numerous colonies in North Africa and along the route to India. The wealthiest power in Europe, Spain extended its interests into the areas now known as Belgium and eastern France. At the same time, the nation was identified as the defender of the Roman Catholic Church, its ruler taking the title His Most Catholic Majesty. In this capacity, Spain became an enemy of Anglican England as well as the Lutheran and Calvinist principalities in Central and Eastern Europe.

A variety of conflicts during the sixteenth and seventeenth centuries witnessed the rising power of France, the resurgence of England, and the decline of Spain. These included the Wars of Religion between England and Spain (1587-1601), the Dutch Wars of Independence (1566-1648) against Spain, and the Thirty Years' War (1618-1648), which spread through much of Europe. Although Spain retained most of its overseas empire and Portugal reassumed control of its empire after 1640, the major colonial forces through the remainder of the century were France, England, and the Netherlands. In the sixteenth century the French established colonial claims and settlements in Canada, the West Indies, and Africa. The English were active in North America, establishing significant colonies there in the seventeenth century. The Netherlands established centers of trade on territories in the West Indies, the Indian Ocean, and the Pacific. From the outset, the geopolitical conditions, combined with the tradition of continuing national conflicts, created an environment that lent itself to the probability of colonial wars.

In the seventeenth and eighteenth centuries, France emerged as the preeminent European power. Historians have frequently interpreted seventeenth and eighteenth century diplomacy as a contest between the absolutist regimes of France, Austria, Prussia, and Russia and the constitutional, representative governments of England and the Netherlands. One should be very careful in extending this general explanation. In most instances it provides an accurate context for European wars at home and abroad, but the particulars of many crises appear to have had little if anything to do with the concept of government.

Under the influence of King Louis XIV (1638-1715), France launched four major European wars: the War of Devolution (1667-1668), the Dutch War (1672-1678), the War of the Grand Alliance (1688-1697), and the War of the Spanish Succession (1701-1714), all of which were reflected in the colonies. England and the Netherlands, an important colonial power with trade routes and significant financial resources, combined under William III; William led the Netherlands against France during the 1670's and 1680's and became William III of England in 1689. In the context of European power, the principal issue at this time was the overwhelming power of France; the question related to the French ability to destroy the balance of power within Europe—the independence of action of the other European powers was at risk. In the colonies the last two of the wars of Louis XIV resulted in major hostilities in North America. Between 1689 and 1697 England and France fought King William's War—the English designation for

the struggle. The French and English were assisted by their respective Native American allies and fought to a stalemate; when the war ended, all territories were returned (*status quo ante bellum*). While the Europeans fought the War of the Spanish Succession, which resulted in containing French power and ambitions, the English successfully fought the French and their Spanish allies in Florida, Acadia, and the Caribbean.

The Anglo-French rivalry was the primary cause for colonial wars in the eighteenth century. In 1739 the War of Jenkins's Ear broke out between Spain and England; it included an unsuccessful English attempt to take Cuba and Florida from the Spanish. This struggle was submerged by a larger European war, the War of the Austrian Succession (1740-1748), that once again pitted the French and English against each other; in addition to the Anglo-French contest, this war was significant because of the impact it had on the development of Central European political history. Austria, allied with France, and Prussia, partnered with England, fought to gain a dominant position in Central Europe. While that issue was not resolved in the eighteenth century, the Prussian and English victories destroyed the reality of Habsburg hegemony throughout Central Europe. After a brief interlude of peace the colonial war between France and England was renewed in both America (the French and Indian War, 1754-1763) and India. In 1756 the Seven Years' War (1756-1763) began in Europe. Both European and colonial wars were concluded by the 1763 Treaty of Paris, through which Britain gained French territory in Canada and India. However the war had been costly for all powers. Britain's relations with its American colonists declined over the issues of increased taxation and also representation in the British Parliament, as well as sharing the cost of defense. In July, 1776, the Americans declared their independence and were later joined by the French and the Dutch in the struggle with England. In the 1783 Treaty of Paris, England recognized the independence of the United States but retained Canada and its colonies in the West Indies.

At the close of the eighteenth century, the ideology of the Enlightenment challenged many basic notions on government, citizenship, and liberty. In 1789 the French Revolution broke out, and it served to be a cataclysmic force in European and world affairs. By 1798 the French Revolution was being led by Napoleon Bonaparte (1769-1821); a serious but practical reformer, Napoleon restored absolutism but tempered it with revolutionary sentiments. The American and French revolutions provided historic examples and motivation for Latin Americans who wanted to be free of Spanish control.

It was the great wealth that could be made in the colonies that attracted many young men to serve in the British East India Company, its French or Dutch counterparts, or elsewhere in the world. Disease in most of these places took its toll, but for those who survived, many could return to their own countries with massive wealth. Examples in Britain were the Pitt family, which went on to produce two prime ministers, and that of Robert Clive.

There was also an ability, through joint-stock companies, for many people who were not prepared to risk going to the colonies to profit by buying shares in companies involved in such trade. The trading in shares in these companies essentially led to the emergence of the European stock exchanges when traders would buy and sell stock based on information they held, or on speculation. In spite of some notable collapses, such as in the tulip market in the Netherlands in the 1630's and the South Sea Company in 1720 (known as the South Sea Bubble), many investors and speculators were still prepared to put their savings into similar ventures.

The desire for profit by company directors led to many instances of gross exploitation of the native peoples. The worst instances surrounded slavery, with many millions of Africans shipped to the Americas to work on plantations where many died through overwork or from disease. The tropical diseases held back development of plantations in Africa until the late nineteenth century, but many were also established in Asia with bonded laborers and convict labor rather than traditional forms of slavery.

During the early decades of the nineteenth century, European interest in colonial acquisitions declined. Nonetheless, European states continued to retain their colonial holdings, and England and France

continued their respective interests in Australia, New Zealand, and Africa. In 1857 the British were confronted in India by the Sepoy Rebellion, precipitated by the introduction of a new rifle that required soldiers to bite off a cover lubricated with pig grease. Muslim soldiers refused to comply and mutinied against their British officers. In 1859 Charles Darwin's *On the Origin of Species by Means of Natural Selection* was published; the concept of social Darwinism quickly followed, and the notions of "survival of the fittest" and the natural conflicts in human and international relations became acceptable. These ideas paved the way for the emergence of a new colonialism, imperialism, which was advanced in the New Imperialism of British Prime Minister Benjamin Disraeli (1804-1881).

Military Achievement

The major military achievements in the age of colonial warfare included the conquest, suppression, or dislocation of the native populations of North and South America; the triumph of Britain in the French and Indian War (1754-1763) in both North America and India; the success of the Americans in their war of independence against Britain; the initial military success and ultimate strategic failure of Napoleon's Egyptian Campaign of 1798 and 1799; and the expansion of Britain and France into Africa during the first half of the nineteenth century.

The Spanish advance in the New World was extensive and based upon the strength of the Spanish military. As well as their own military power, it re-

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Spanish conquistador Francisco Pizarro captures Inca king Atahualpa in 1532. By 1600 Spain controlled all of the land from New Mexico and Florida in the north to Chile and the Río de la Plata in the south, with the exception of Portugal's Brazil.

lied on tactical alliances with some of the people in the Americas, with Hernán Cortés managing to get much support from Native Americans who were angered by the rule of the Aztecs. This policy of divide and rule had been practiced by the Romans in the building up of their empire and was quickly adopted by the European colonial powers.

By 1600 Spain controlled all of the land from New Mexico and Florida in the north to Chile and the Río de la Plata in the south, with the exception of Portugal's Brazil. The oppressive Spanish Conquest rested on a continued military presence and the suppression of the native populations; it was aggravated by the introduction of slaves from Africa. The destruction of the Mayan civilization was achieved through military forces under Francisco de Montejo in the sixteenth century. Spanish colonization remained the most active near seaports; the development of the interiors required extensive time and effort.

In the mid-eighteenth century Great Britain and France fought several wars. From the perspective of colonial wars, the most significant was the French and Indian War. During this struggle both powers were supported by the colonists and opposing Indian tribes. During the early years of the war, each side encountered victories and defeats; Britain was defeated at Fort Duquesne (1754) but prevailed at Lake George (1755). The turning point occurred in the campaign of 1759, when the British defeated the French at Quebec. Both Quebec and Montreal then came under British control, and by the end of September, 1760, Canada was British territory. This acquisition was ratified in the 1763 Treaty of Paris, which ended the war. In the same treaty Britain received Martinique, Grenada, St. Lucia, St. Vincent, and other French islands in the West Indies.

Without doubt the most significant colonial war of the era was the American Revolution against Britain. British forces prevailed militarily in almost every encounter during the war. However, at Yorktown (1781), a combined American-French force defeated the British army under the First Marquess Cornwallis (1738-1805). With traditional tactics, commander in chief of the Continental army George Washington (1732-1799) succeeded in forcing a British surrender. The British effort was doomed from the outset. As a colonial power under King George III (1738-1820), the British were unwilling to reach a political settlement with their colonists. That error was compounded when they failed to recognize the resources that would be necessary to suppress a general rebellion with a battle line extending from Massachusetts to Georgia. The arrival of the French at Yorktown was also decisive; the French blocked any possible British retreat by sea and contributed troops and artillery for the Siege of Yorktown. This revolution led directly to the French Revolution and that to the Wars of Independence in Latin America.

In 1798 Napoleon Bonaparte led a military expedition to Egypt to attack the British position in India. Although Napoleon enjoyed a number of victories over Turkish and native forces, such as the Battles of the Pyramids (1798) and Aboukir (1799) and the Sieges of Alexandria (1798) and Jaffa (1799), he was overwhelmed by the brilliant naval strategy of Admiral Horatio Nelson (1758-1805) in the Battle of the Nile (1798). The French fleet was destroyed and Napoleon was forced in the next year to abandon his army and return to France.

WEAPONS, UNIFORMS, AND ARMOR

From the fourteenth to mid-nineteenth centuries, gunpowder weapons gradually replaced older medieval shock weapons. Although the wide range of medieval weapons continued to be employed in combat, they were increasingly replaced by the products of the gunpowder revolution. The development of corned powder resulted in more predictable and powerful detonations and led to advances in ballistics. Artillery advances were achieved with iron and bronze cannons; the matchlock, wheel lock, and flintlock firing mechanisms improved rifle and pistol accuracy, reliability, and safety. In the eighteenth century musket powder was developed for use in cannons, muskets, and pistols.

During the same century the English mathematician Benjamin Robins (1707-1751) invented the ballistic pendulum, a device that measured muzzle velocity. This instrument opened a new phase in the history of ballistics. Further advances in powder and

F. R. Niglutsch

Bengali mobile cannons are shown being pulled by oxen during the Battle of Plassey (1757).

firing were achieved in the early nineteenth century by Alexander Forsyth (1769-1843), a Scottish clergyman and inventor who assisted in the development of percussion ignition, and Joshua Shaw (1776-1860), an American who is credited with inventing the percussion cap in 1815. The British Long Land musket was known in the American colonies as the Brown Bess during the French and Indian War. After its weight was recognized as a problem in the colonies, it was shortened. The Brown Bess was the standard weapon used against Britain during the American Revolution. The 45-inch French Model 1763 and Model 1777 were significantly improved muskets. Rifling technology developed throughout the nineteenth century, and by the end of the American Civil War (1861-1865), rifles had replaced muskets. Advances in artillery paralleled those in rifling, with improved accuracy and firepower. By the time of the Civil War, artillery could deliver explosive shells that devastated lines of march as well as fixed targets.

During the colonial era, Europeans wore their standard uniforms in combat. Brightly colored uniforms were ready targets for the opposing forces. Officers were easily identified. Colonial militias were uniformed as well; only native peoples in the service of a European power were not uniformed. This did, however, led to many native people being killed after battles with the colonial powers claiming that as they were not in uniform they were, in effect, spies. This was particularly true in counterinsurgency campaigns.

From the fifteenth through the late seventeenth century, Europeans continued to use some of the personal armor associated with the medieval period.

Although the use of such armor in colonial wars was less frequent, breastplates and helmets continued to be used. The protection associated with armor was based on personal hand-to-hand battlefield combat. With the increased use of gunpowder weapons, however, the armor of the time was ineffective and hindered the movements of the soldiers. Mobility was emphasized by Sir John Churchill, first duke of Marlborough (1650-1722) and Prince Eugène of Savoy (1663-1736), the leaders of the coalition forces against France during the War of the Spanish Succession (1701-1714). Likewise, armor was more of a detriment than an advantage in the colonial wars of the period. Armor for weapons was considered and adopted by the European armies during the eighteenth and nineteenth centuries. Coastal gun emplacements frequently provided armored protection for the guns and the personnel.

MILITARY ORGANIZATION

The design of the military organizations of the European colonial powers differed from those states that were not involved in colonial struggles. The two most evident differences were their reliance on colonial militias and their reliance on strong naval forces to transport troops and supplies. Britain's success in colonial wars resulted in large part from its superior navy and from the large numbers of colonial militiamen that could be brought into combat.

During the early centuries of the era of colonial war, the medieval notion that the landed aristocracy would provide the officer class continued. It was not until the eighteenth century, with its emphasis on professionalism, that the officer corps was opened to talented men from other classes. Once again, the British were more advanced than others. The French army during the French Revolution (1789-1793) and the ensuing Napoleonic period was accessible but reverted to the aristocracy after Napoleon's defeat (1815).

The colonial militias consisted of gentlemen farmers and merchants and their men. Although Washington had served in the French and Indian War, he was basically a farmer without any formal military training. The militias were armies of citizen soldiers; they fought colonial wars for specific reasons that they understood. In both America and France, these militias were the beginnings of "national" armies, unlike the armies that fought either for their monarch or for payment.

In addition, chartered companies such as the British East India Company, the Dutch East India Company (Vereenigde Oost-Indische Compagnie, or VOC), and the Compagnie Françoise des Indes (French Company of the Indies) were able to raise their own armies, which served as forms of paramilitaries, sometimes alongside national forces, and sometimes on their own. These quasi-military forces were often later integrated into national armies often directly with a regiment in one being transformed into a regiment in the other.

It was often these quasi-military forces which were able to prove the most effective in colonial wars. These often included officers from Europe, and then local recruits, as well as auxiliary units, the latter modeled on their Roman counterparts (the study of the Roman Empire became extremely popular during the eighteenth and nineteenth centuries). These chartered companies were able to draw up treaties with local rulers and were often provided soldiers by them, such as the Sikh units who fought alongside the British East India Company.

DOCTRINE, STRATEGY, AND TACTICS

Colonial conflicts between European rivals were fought using both traditional continental battle tactics of organized ranks facing one another in exchanges of gun and cannon fire and the less predictable guerrilla warfare tactics used by native and colonial populations. Native populations in America, Africa, and South America taught the European powers the importance of speed in combat, forcing them to adapt to local conditions. The uncertainty of geographical considerations was another factor that impacted colonial warfare. The major powers were dependent upon local sources for intelligence about the land, rivers, streams, crossings, resources, routes, emplacements, and concentrations of people. In North

America, it was not until the nineteenth century that this information was generally known and published; in South and Central America, Africa, and Asia, this information was not categorized until the mid-twentieth century. Finally, European military doctrines and strategy failed to appreciate fully the nature of colonial rebellions. Americans, Zulus, Chinese, and other local revolutionaries entered struggles to expel Europeans, not simply to gain a victory or to prevail in one of a series of wars. This raison d'être for colonial revolts provided an ideological motivation that was not recognized fully during the colonial wars.

Contemporary Sources

From the fifteenth to the mid-nineteenth centuries, with the expansion of printing and transportation, military strategists had increasing access to the strategic and tactical thoughts of others. In most instances, the strategy and tactics employed in Europe were extended and adapted in colonial wars. Among the earliest sources were Hernán Cortés's (1485-1547) description of the Siege of Tenochtitlán in 1529 and Francisco de Jerez's (born 1504) analysis of the capture of the last Incan emperor, Atahualpa (c. 1502-1533), in 1533.

More widely disseminated sources include Niccolò Machiavelli's (1469-1527) *Il principe* (1532; *The Prince*, 1640), *Discorsi sopra la prima deca di Tito Livio* (1531; *Discourses on the First Ten Books of Titus Livius*, 1636), *Dell'arte della guerra* (1521; *The Art of War*, 1560), and *Istorie fiorentine* (1525; *The Florentine History*, 1595). Although Machiavelli's works provided many insights into the Renaissance concepts of war, they clearly indicate that Machiavelli did not understand the value of artillery.

Two contemporary sources on naval strategy and tactics were Richard Hakluyt's (c. 1552-1616) description of the destruction of the Spanish Armada in *The Principall Navigations, Voiages, and Discoveries of the English Nation* (1589, 1598-1600) and Armand Jean du Plessis, duc de Richelieu's (1585-1642) thoughts on sea power, published in his *Testament politique* (1645; *Political Testament*, 1961). Military organization and formations were studied in Jean-Charles de Folard's (1669-1752) *Traité de la colonne et de l'ordre profond* (1730; treatise on the column) and *Nouvelles découvertes sur la guerre* (1724; new developments in warfare). Two other significant eighteenth century sources were Maurice, comte de Saxe's (1696-1750) *Les Réveries: Ou, Mémoires sur l'art de guerre* (1756-1757; *Reveries: Or, Memoirs Concerning the Art of War*, 1776) and King Frederick the Great (1712-1786) of Prussia's *Instructions militaires du roi de Prusse pour ses généraux* (1765; *Military Instructions for His Generals*, 1944). The era of warfare associated with the French Revolution and Napoleonic Wars produced many significant works by its participants. Horatio Nelson's "The Trafalgar Memorandum" (1805) is a classic and clear statement of naval strategy, and Napoleon Bonaparte's views on strategy and tactics were published in his *Maximes de guerre de Napoléon* (1827; *Military Maxims of Napoleon*, 1831), which were included in several books published after his death in 1821. Finally, the experience of Prussian Carl von Clausewitz (1780-1831) in the wars against Napoleonic France led him to work to reform the Prussian army. His classic study, *Vom Kriege* (1832-1834; *On War*, 1873), was published after his death in 1831 and influenced military planners for generations.

As well as books on strategy and military science, there were countless books published that were written by participants in various conflicts. Many of these had a ready audience in their home countries, and some were translated and sold elsewhere. There was also coverage, from the 1790's, in newspapers and later in weekly and monthly magazines.

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William T. Walker

The Ottoman Empire

Dates: 1453-1923

Political Considerations

The Ottoman Empire, founded by Osman I (r. 1290-1326), dominated much of southeastern Europe, the Middle East, and North Africa between the fourteenth and early twentieth centuries. Ottoman military superiority in the Balkans in the fifteenth and sixteenth centuries stemmed from the use of new modern armaments integrating infantry and cavalry with innovative tactics. The Ottomans borrowed methods from their adversaries and even used Christian and Jewish soldiers and officers in their campaigns. In addition to a magnificent army, they had a navy that was among the best in the Mediterranean area. However, one aspect of the early Ottoman success has been greatly exaggerated—that of the Ottomans' superiority in numbers. The Ottomans' rapid conquest of the Christian, Greek-speaking, Eastern Roman Byzantine Empire, as well as the other Balkan states in the years from 1290 to 1453, came not from larger forces but from essentially waiting for their Christian rivals to destroy each other in battle and then moving in and taking over the remaining territory. The Ottoman sultans made alliances with

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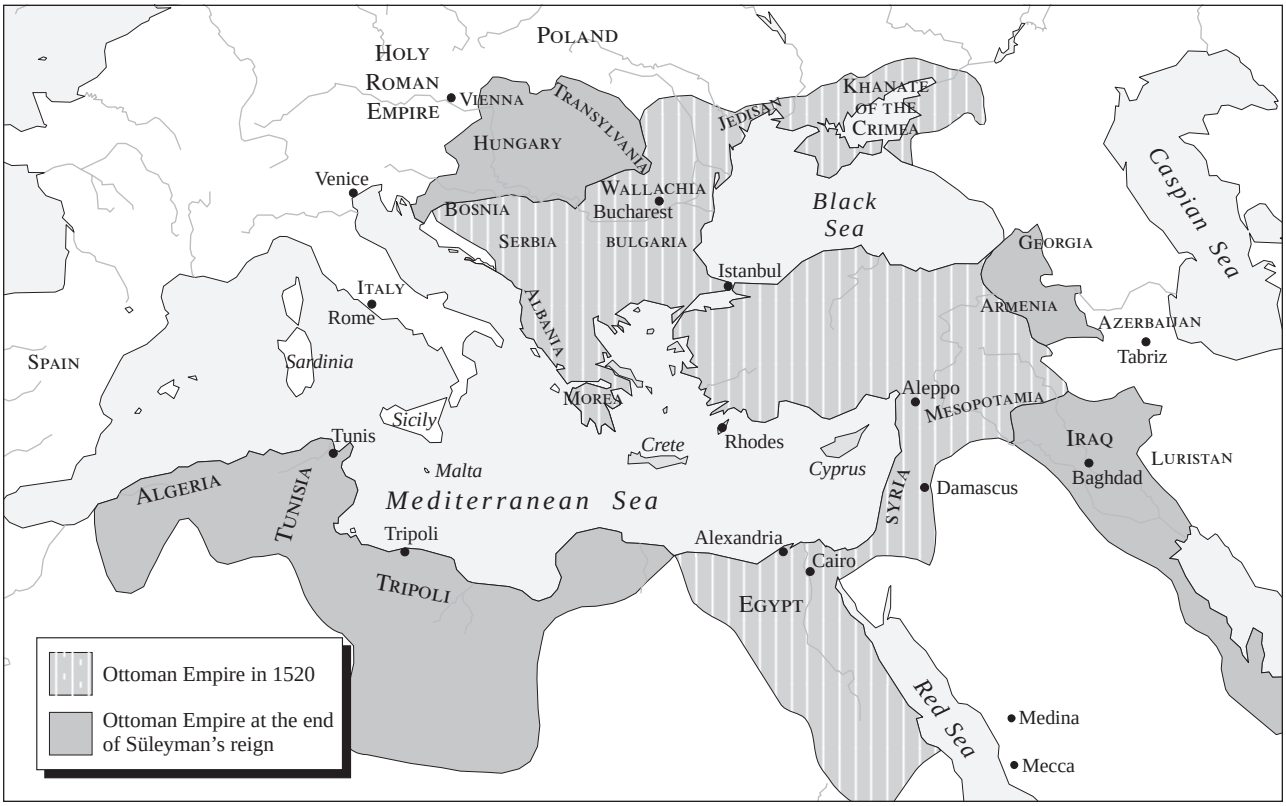
The Ottoman Turks seize Constantinople from the Byzantines in 1453 to establish the Ottoman Empire.

OTTOMAN EXPANSION UNDER SÜLEYMAN THE MAGNIFICENT



Christian states, and Turkish soldiers served as mercenaries in Christian armies, just as Christians fought in the Turkish armies.

National mythology has also greatly exaggerated the historical significance of key Ottoman victories before 1453, such as the defeat of the Serbs at Kosovo on June 15, 1389. In many ways the Ottomans inherited the Balkans by default, because the Byzantine army collapsed as a result of internal civil wars and external invasions by the Western European Christian Crusaders and other neighboring Christian states.

The decisive victory that established the Ottoman domination of the Balkans was the Siege of Constantinople in 1453. The Turks had prepared for this battle for fifty years. According to legend, the city was to fall to a sultan bearing the name of the prophet Muḥammad. Sultan Mehmed I (r. 1402-1421) initially appeared to be that man, but an internal contest for the throne and a war against Tamerlane in the east made his attack on the Byzantine capital impossible. However, when his grandson Mehmed II (1432-1481) ascended the throne in 1451, both sultan and people were ready.

By 1453 Constantinople had become a shadow of its former self. The city's population, which had once exceeded one million people, had declined to only several tens of thousands. Constantinople was no longer a unified city but rather a series of villages behind walls. Mehmed II prepared his attack carefully, building fortresses on both sides of the Bosporus—Anadolu Hisari on the Asian side and Rumeli Hisari on the European side—the ruins of which still stand. He strengthened the janissary corps, raising their pay and improving the officer ranks. He constructed causeways over the Galati hill north of the old city, so that he could have his ships dragged up and over to the Golden Horn, the harbor of Constantinople, circumnavigating the chain and flotilla that protected

the entrance to the city's vulnerable side. Mehmed's fleet of 125 ships and an additional number of smaller support craft was five times larger than that of the Greeks. With this fleet, Mehmed prevented the Byzantines from bringing supplies by sea as they had done in the past. The first Turkish troops to reach the walls of Constantinople in April, 1453, were a few knights, who were successfully met by the Byzantine soldiers in a brief skirmish. Ottoman reinforcements then drove the Greeks back behind the walls. Massive Turkish forces gathered over the next days, including cavalry, infantry, engineers, and naval forces. Most important were the cannons Mehmed had placed at the heretofore impenetrable walls; they began a constant bombardment that continued for seven weeks until they finally breached the wall.

Mehmed and his entourage of janissary soldiers, advisers, and imams, or religious leaders, took up their positions before the city. Mehmed offered the city either mercy if it surrendered without a fight, or pillage if it chose to fight. The Greeks chose to fight to the last.

After the fall of Constantinople the Ottomans continued to expand throughout the Muslim world in the Near East and North Africa. At the height of the empire under the sultan Süleyman I the Magnificent (1494 or 1495-1566) the European boundaries reached beyond the Danube River to the gates of Vienna. Süleyman's failure to take the Habsburg capital owed as much to the limitations of Ottoman military tactics, especially the definition of its campaigns by annual sorties lasting only from the spring to the fall, as it did to the defense of the Viennese. Süleyman also fought and lost to the naval forces of King Philip II of Spain (1527-1598) in the Mediterranean at the celebrated Battle of Lepanto (1571).

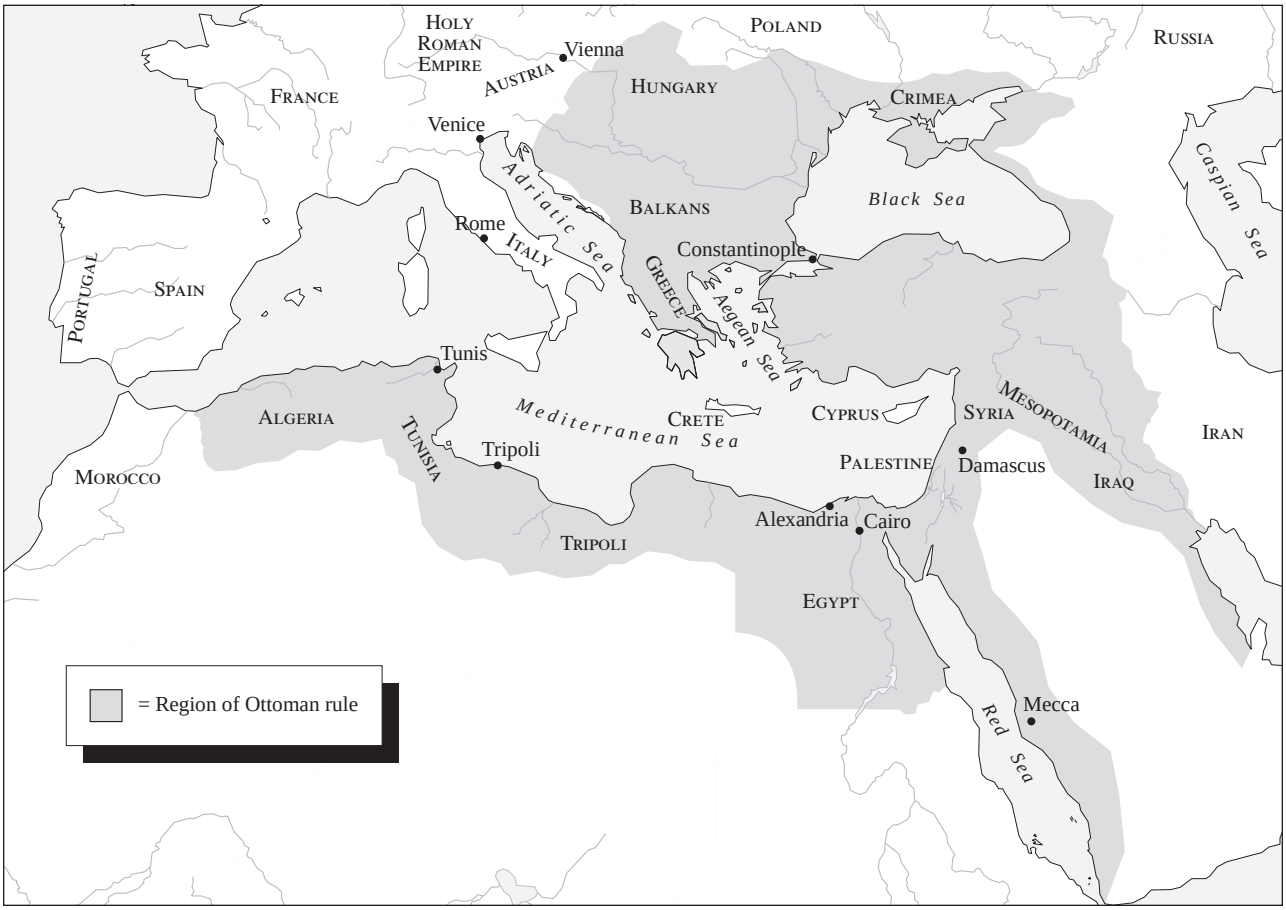
After Süleyman the Ottoman Empire went into a decline. Succeeding sultans rarely left their palaces and placed state matters in the hands of their ministers, most of whom were Christian slaves taken in the child tax from Balkan families. The Ottomans fought against Austria, Poland, the Papacy, and other European states for control of the Danubian plain for two hundred years. However, they found a European ally in France. In the late seventeenth century the grand viziers of the Albanian Köprülü family arrested the decline of the Ottoman Empire and spearheaded a revival of its former power. However, in 1664 at Szentgotthárd, on the Austrian-Hungarian border, the Ottomans suffered their first loss of land to the Christian powers. After the Thirty Years' War (1618-1648) the improved European armies surpassed the Turkish army in organization, tactics, training, armament, and even leadership. The Turks, whose advanced techniques and equipment had previously been their strong points, now found themselves falling behind their adversaries in these areas.

The Ottomans' failure to take Vienna in a second attempt (1683) began the loss of their territory to the European powers. In the eighteenth century the empire lost wars and land to both Austria and Russia. Inside the empire local warlords carved out virtually independent fiefdoms throughout the imperial provinces. The sultan's personal authority in reality did not extend beyond Constantinople. The grand janissary corps, which had gained the right to marry, were less an effective fighting force than a collection of sinecures. In 1792 Sultan Selim III (1761-1808) turned to France, the empire's old ally, for assistance in modernizing Ottoman armed forces, creating a modern corps in addition to the janissaries. However, the French Revolution (1789-1799) and the Napoleonic Wars (1793-1815) interrupted the partnership. The

Turning Points

1453	With use of large cannons, the Turks capture Constantinople from the Byzantines, establishing the Ottoman Empire.
1571	The Battle of Lepanto II, fought between the Ottoman Turks and the Christian forces of Don Juan de Austria, is the last major naval battle to be waged with galleys.
1792	Modern French military techniques and arms are introduced into Turkey.
1826	The janissary corps are destroyed and the Turkish army is modernized.
1923	The Treaty of Lausanne creates the Republic of Turkey, bringing the Ottoman Empire to its official end.

THE OTTOMAN EMPIRE, C. 1700



empire suffered from internal revolutions, such as those by the Serbs and the Greeks, and from uprisings by warlords and rogue pashas such as Ali Paşa (1741-1822), known as the Lion of Janina, in modern Albania, as well as wars with Russia and Persia. In a janissary revolt in 1806 Selim was dethroned and killed. His successor, Sultan Mahmud II (1785-1839), believed that the defeat of Napoleon would guarantee Ottoman territory at the Congress of Vienna (1814-1815), but when the Greek uprising of 1821 split the European alliance, Mahmud found himself at war against the combined forces of Russia, France, and England. In 1826, in order to modernize his forces, he did away with the janissaries.

Mahmud's successor, Abdülmecid I (1823-1861), allied himself to the powers by promising reforms in the treatment of his non-Muslim subjects. In the 1830's and 1840's the powers protected Abdülmecid from a vassal revolt. In the 1850's England and France joined Abdülmecid in the victorious Crimean War (1853-1856) against Russia. However, in 1877 Russia again went to war against the Turks to aid a Balkan uprising. Although the Russians defeated the Turks and liberated the Christian states of the region, England, Turkey's ally, prevented the Russian troops from taking Istanbul.

In the early twentieth century the Young Turk Revolution brought constitutional government and more westernization to the empire. However, Turkey lost wars to Italy (1911) and to a coalition of Balkan states (1912-1913), only managing to regain a modest amount of European territory around Edirne in the

Second Balkan War (May-June, 1913). After feeling betrayed by England and France, the Young Turk leaders turned toward friendship with Germany. After the outbreak of World War I in 1914, Turkey joined with the Central Powers in November of that year. Turkish troops faced the Russians in the Caucasus and the English in the Near East. The English had by then occupied Egypt and supported a revolt of the Arabs in Saudia Arabia and Palestine. With the collapse of Russia in 1917, the Turks received territory in the Caucasus, but the following year the Central Powers lost the war and the Allies divided up the territory of the empire among themselves.

However, while the Allies occupied Constantinople, Mustafa Kemal (1881-1938), later named Atatürk, or Father of Turks, raised the standard of revolt in Ankara, where he set up a rival government. Kemal led the army to victory over the Greeks (1920-1922) and renegotiated the Treaty of Sèvres (1920) to his advantage in the Treaty of Lausanne (1923), creating the Republic of Turkey and bringing the Ottoman Empire to its official end.

Military Achievement

The Ottoman Empire in its early years successfully defeated the Christian powers of Europe and the Muslim states of the Near East. This success stemmed from the Ottomans' innovative use of tactics and strategy integrating cavalry and infantry. The Ottoman cavalry, or sipahi (rendered in English as "spahi"), was drawn from the noble free-born Muslim class, whereas the infantry, the janissaries, were slaves of the sultan forcibly recruited from the children of conquered European peoples, converted to Islam, and trained as fierce fighters. There were also irregular cavalry and infantry troops. The Ottomans also did not hesitate, when it served their purposes, to use Christian or Jewish commanders, as well as Christian allies and mercenaries.

The Muslims were among the first to effectively use cannon and gunpowder. Their success against European armies continued into the seventeenth century, when the decline of the empire began.

Weapons, Uniforms, and Armor

In the early centuries the Ottomans effectively used siege weapons and artillery, such as mortars, catapults, and large cannons, that fired both iron and stone shot. Mehmed II, also called Mehmed the Conqueror, wished to have the most modern weapons and ordered a Hungarian gunsmith to build him large cannons, one of which was used at Constantinople, that could fire 1,200-pound cannonballs. Janissaries used scimitars, knives, stabbing swords, battle-axes, and harquebuses. The Turks were also skilled marksmen using muskets. Ottoman archers continuously rained arrows on the defenders of cities they attacked. The Ottomans were renowned for their sappers as well, who attacked the enemy's fortifications with axes. The spahi cavalry, true medieval warriors, carried bows, swords, lances, shields, and maces. The Ottoman navy consisted of corsairs and oared galleons.

The Turks established local janissaries and other regional corps in different parts of the empire, each with its own distinct uniforms, pennants, and standards. The traditional Ottoman uniforms consisted of short, loose pantaloons, a short shirt with a large sash, a high turban, stockings that reached above the hem of the pantaloons, and Turkish-style slippers. Janissaries also wore long, flowing robes and felt hats. The *akhis*, or officers, wore pantaloons, sashes, capes, red boots, long fur-trimmed robes, and tall, elaborately carved, large-plumed helmets whose height depended on the wearer's rank. Janissary food bearers wore black uniforms, sandals, pantaloons, short jackets with long sleeves, half-vestlike shirts, and conical hats. The sultans rode on caparisoned, or decoratively adorned, horses and carried bejeweled weapons.

The janissaries' standard was the scarlet crescent and double-edged sword symbol of Osman, the founder of the Ottoman dynasty. The akhis carried staffs with tails representing the sleeve of the sheik of the Bektashi dervishes, the janissaries' religious order. The number of tails on the akhi's staff depended on his rank. The janissaries' staff bore a spoon symbolizing their higher standard of living. The insignia of the janissary corps was the soup pot and the spoon.

Officers bore titles from the kitchen such as the First Maker of Soup, First Cook, and First Water-Bearer. The soup pot was the sacred object around which the janissaries gathered to eat or discuss events and policies. In rebellions they traditionally overturned these soup pots.

In the seventeenth and eighteenth centuries Turkish armament lagged behind the times. In 1796 the French ambassador General Jean-Baptiste Aubert-Dubayet brought to Turkey several pieces of modern armament and artillery as models for the Turks to copy and French engineers and artillery officers to teach the Turks modern methods. In the nineteenth and twentieth centuries the Ottoman Empire continued to modernize its forces and weaponry. Before World War I the Germans improved upon Turkish arms. German General Otto Liman von Sanders (1855-1929) came to Turkey to oversee the training of troops. During the war the Turks had excellent gunnery. However, two battleships ordered from England, which were to be the best of the fleet, had not been delivered before the Turks joined the Central Powers and were confiscated by the British. In the late nineteenth century the Turks adopted typical European khaki winter and summer army and blue navy uniforms. For officers, the fez—a brimless, flat-crowned hat—replaced the turban.

MILITARY ORGANIZATION

Within the Ottoman Empire the government and the military were closely linked. The empire was divided into two parts: European and Asian, each governed by *aghas*, area governors who administered the empire in the name of the sultan. Under the *aghas* stood the provincial governors, or *sanjak beys*. The sanjak, which has come to mean "province," was literally the standard of the governor, or bey. In 1453 there were twenty sanjaks in Asia and twenty-eight in Europe. The sanjak beys commanded troops, operated the policing powers in their provinces, and collected taxes. Within the sanjaks there were two types of agricultural estates: large *zaimets* and smaller *timars*. Ottoman theory held that all land belonged to God and was managed by the sultan; the managers of these estates were free-born Muslim noblemen. The spahis, knights who served as the cavalry of the Ottoman armies, were the most numerous Ottoman warriors. The early sultans gave most of the land they conquered to these warriors, although a minor portion was reserved for government and diplomatic officials. The peasants, called *rayah*, literally "cattle," were the serfs who worked the land. The other governing functions were handled by the various Muslim, Christian, and Jewish religious authorities who ruled their own communities.

The Ottomans used both regular and irregular troops as police forces. The two most important regular land forces were the janissary infantry corps and the spahi knights. The Ottoman navy was a supplementary force that often carried janissary troops, as well as naval officers and sailors.

The janissaries were Christian and Jewish boys, as young as seven years old, periodically gathered in the Balkans through a child tax, called *devshirme*. Girls were also gathered to serve in various harems. Sultan Orhan (c. 1288-c. 1360) started the corps as a bodyguard, and Murad I (c. 1326-1389) developed it as a militia to guard the European territories. The boys were selected for the janissary corps based on their strength and intelligence. They were educated as Muslim Bektashi dervishes, the religious order favored by Ohran, and housed in barracks at Bursa. After the fall of Constantinople in 1453, Mehmed II moved the main janissary barracks to the sultan's palace in the capital. During battle, conquered fortresses served as their barracks, and local produce served as their food.

A minority, approximately 15 percent, of the most intelligent children were selected for government and diplomatic service, while the remainder were trained for the janissaries. The boys were educated in the palace school, where they studied subjects such as Turkish history, Muslim literature, and romantic and martial music. They practiced gymnastics and sports on both foot and horseback to increase their strength and agility. The students became expert in archery, swordsmanship, javelin throwing, and riding.

Early janissaries could not own property, marry, or perform other service, but they were armed and

well paid and had a strong esprit de corps. They were the most respected infantry in Europe: fearless, well trained, dedicated troops with intelligent and cool-headed commanders. At the dedication of the corps, the sheik of the Bektashi, an officer of the corps, promised, "Its visage shall be bright and shining, its arm strong, its sword keen, its arrow sharp-pointed. It shall be victorious in every battle and will never return except in triumph." The janissaries were known for their military discipline, which rivaled that of the ancient Greeks and Romans.

In contrast to the "inside aghas," who were leaders of the government and palace service, the chief janissary officers held the title of "outside aghas." In the time of Mehmed II they numbered a force of ten thousand. They were unique in Europe, where most armies consisted almost completely of cavalry. The janissaries were commanded only by aghas, who had been appointed by the sultan, and the provincial beys and pashas had no authority over them.

When the Ottoman Empire went into decline, the janissary corps began to deteriorate. Muslims were recruited into the janissaries, affecting the traditional camaraderie. Janissaries also worked as artisans to supplement their income. During Süleyman's reign, they received the right to marry, and their sons began entering the corps, first through loopholes in the law and later through quotas. Nepotism grew rampant. Murad IV (1612-1640), recognizing the de facto practice, abolished the devshirme. Janissaries often paid others to serve in the field in their place, while still collecting their pay and enjoying their privileges.

The corps, if they disagreed with the imperial policies, would often mutiny in the field or in Constantinople. The janissaries began to influence politics as early as the fifteenth century, when they backed the sultan Mehmed I against his brothers, but in the seventeenth century the corps became stronger than the sultan. Sultans and ministers curried favor with the janissaries as well as the spahis through promotion and pay raises.

REPUBLIC OF TURKEY, 1923

The vizier Köprülü Amca-zāde Hüseyin (died 1702) tried to reverse the downward trend by revising the muster roles of the janissaries, improving military equipment for both the janissaries and the navy, building new barracks, and refurbishing the imperial defenses, but the measures proved to be only temporary. The Ottoman forces also included renowned artillery and engineering units and highly skilled artisans who were supported through a guild system. These artisans supplied the Ottoman armies and maintained their morale and standard of living.

The Turkish sipahi cavalry were considered to be without peer. They were ready at any moment on the command of the sanjak beys to leave their fields and join in battle. Failure do so would mean loss of their position. Although the ranks were not hereditary, the son of a deceased spahi might be given a small amount of land for his needs. He would then have to prove himself in battle to earn a tamir or zaimet. There were also mounted soldiers at a lesser rank than spahi, and the spahis of the Porte in Constantinople, "the men of the sultan," who formed a separate corps. In the seventeenth century the number of feudal spahis dwindled, and, like the janissaries, the spahi also began to hire substitutes, some of whom were unscrupulous adventurers. Spahis were no longer suited for all-year duty against the modern European artillery. At the Battle of Mezö-Keresztes (1596) against Hungary they left the field en masse. The sultan dismissed thirty thousand spahis, turning a large group of nobles into landless malcontents and further increasing the problems of the empire.

In times of war the Ottoman Empire employed a supplemental irregular cavalry, the *akinjis*. Other irregular troops were the azab corps, a reserve infantry founded by Orhan. The sixteenth century governor of Bosnia used another irregular force to police his sanjak. These irregular troops did not receive regular pay but were rewarded with spoils of war. However, jealous of the pay and privileges of the regular forces, they sometimes rebelled.

In the seventeenth century the Ottoman Empire also fell behind in inventory and supply. While the great powers of Europe established modern professional armies in the sixteenth and seventeenth centuries, the sultans stubbornly held on to their antiquated traditional techniques. They lacked modern financing procedures and an industrial system based on flexibility, free enterprise, and competition that was required for modern warfare. Pillaging and living off the land no longer sufficed. The haphazard Turkish system of taxes and economic restrictions held the empire's military behind while its European enemies forged ahead. Furthermore, the janissaries and artisan guilds joined together to protect their traditional privileges and maintain the military's traditional procedures.

In the eighteenth century all aspects of the army—training, discipline, armament, fortifications, field maneuvers—fell to a substandard state. Incompetence and ignorance ruled even in the most elementary matters. Open defiance and mutiny were rampant among the troops. Theft of supplies by both officers and soldiers was common. Janissaries often did not go on campaign but hired people in their stead. Janissaries would fight with their officers or demand privileges reserved for officers. The corps became a parasitic burden, a shadow of the unbeatable force it had been in its early days.

After a loss to the Russians in 1792, Sultan Selim III was anxious to reform his army. Although Selim's many reforms were not limited to military matters, an overhaul of the army played a key part in his plans. Selim looked to France, where the French Revolution of 1789 had brought about a new order. He sent special ambassadors to the courts of Europe and studied their detailed reports. He was particularly interested in guns and artillery, about which he himself had written a treatise. He was especially impressed with the revolutionary French army and requested help from Paris to improve the Turkish military. The French experts improved Turkish gun foundries, arsenals, and equipment. In both the army and navy they taught the Turks gunnery, fortifications, navigation, and related subjects. The Turkish engineering school was brought up to modern standards.

However, the sultan's advisers were divided. Some insisted on maintaining the old Turkish ways at any cost, whereas others advocated the Western techniques only to restore the past Turkish glory; still others called for a complete overhaul of the Turkish

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The British defeat of the Ottoman fleet at the Battle of Navarino Bay in 1827 effectively destroyed the Ottoman navy and paved the way for Greek independence.

military and society in the Western manner. Selim established the Topiji—a small force of prisoners, European deserters, and poor Muslims—and had them trained in the Western fashion as a prototype army. Impressed by the Topiji's superiority, Selim tried to introduce their methods and arms into the Turkish forces. The spahis accepted the new methods, but the janissaries continued to resist modernization. Selim thus enlarged the Topiji force, which by then included some of the French officers who had remained in Turkey. In 1805 he introduced a draft but was assassinated the following year in a janissary revolt. Mahmud II then ascended the throne.

The success of Mehmed Ali of Egypt in building a Western army with Muslims encouraged Mahmud to do away with the janissaries and rely solely upon the new army. Mahmud replaced the European officers training the troops with Muslims and ordered 150 troops from each janissary battalion to join the new corps. On June 15, 1826, as expected, the janissaries revolted, overturning their soup pots and invading the palace. Mahmud was ready. He had increased his loyal artillery troops, placing them in strategic points in the streets. They drove the rebels back to their barracks, where they barricaded themselves and were destroyed by artillery in less then an hour. More than six thousand died in the shelling. Mahmud executed the surviving leaders, disbanded the corps, and outlawed the Bektashi dervish religious order. The remaining janissaries were exiled to Asia.

After the destruction of the janissaries, Mahmud reintroduced the old title *serasker*; originally held by a high commander of general rank, it was now given to the commander in chief who also served as minis-

ter of war and handled police duties in Constantinople. He paid special attention to the new army. Twelve thousand men were stationed at Constantinople and elsewhere in the provinces. Mahmud turned to England and Prussia for assistance training the new army. Officers were sent to England, and British officers came to Turkey. Prussia sent Lieutenant Helmuth von Moltke (1800-1891), who later became an architect of Prussia's renowned army, as a military adviser. Von Moltke helped to modernize the Ottoman Empire's defenses and to train and organize the new troops. He was dissatisfied, however, with Mahmud and the Ottoman army, who resisted instruction from foreigners. Turkey and Prussia exchanged cadets and officers as well, establishing a German tradition that would continue through the life of the empire.

In the 1840's the army was reorganized into active and reserve units, and the term of active service was reduced from twelve to five years. Soldiers who had actively served for five years would serve the balance of seven years in their home provinces as reserves. The military was further reorganized along Western lines, the number of troops was increased to 250,000, and military schools were established.

In 1808 the Young Turk Revolution brought German trained officers forward. Enver Paşa (1881-1922), one of the leaders of the revolt, had trained in German methods as a young officer and now went to Berlin as military attaché. The war minister Sevket Paşa (1858-1913) actually trained in Germany. Thus, the German influence that had existed since the time of Mahmud actually increased during the nineteenth century.

After the Young Turk Revolution, the use of officers in government positions reduced the efficiency of the army and navy in the field. Furthermore, capable officers opposed to the government were sent to distant posts. The defeats of the Italian and Balkan Wars impressed upon the new leaders the need for massive reform. Enver Paşa, who by that time had become one of the ruling triumvirate along with Mehmed Talât Paşa (1872-1921) and Ahmed Cemal Paşa (1872-1922) took this in hand. Much of the problem was the mistrust that the older officers had of the young military supporters of the revolution, a situation that demanded a general purge of the senior officers. Sevket Paşa recognized the problem but refused to dismiss his friends in the officer corps. Therefore Enver Paşa took over the ministry and convinced the reluctant Sultan Mehmed V (1844-1918) to issue a decree retiring officers over fifty-five years of age. A new agreement with Berlin brought forty German officers to Turkey. They were led by Liman von Sanders, who was placed in charge of the first army in Constantinople.

DOCTRINE, STRATEGY, AND TACTICS

From the early days of the Ottoman Empire, the doctrine of warfare called for the conquest of Muslim and Christian land in the name of God. In fact, all of the empire's territory was seen to be God's land, administered by the sultan through aghas, beys, and pashas, military leaders as well as government officials. When the Ottoman sultans became the rulers of the Muslims of the Near East, they revived the old title of caliph, for the religious leader of Islam.

The Ottoman strategy was simple. On yearly campaigns, which, after 1453, began from Constantinople in a formal ceremonial military parade and lasted until late fall, their well-trained and courageous armies fought and conquered as much land and as many cities as they could. Victims who acquiesced were shown mercy. Those who resisted suffered a brief period of brutal pillage. In the fifteenth and sixteenth centuries the Ottomans managed the lands under their control well. Even non-Muslim communities had a great deal of autonomy. In the later centuries, inefficient government and arbitrary actions of virtually independent warlords, landlords, and local beys and pashas inflicted hardship.

The Ottomans learned from their adversaries, studying Western military forces and strategies. After the seventeenth century the viziers, more often than the sultan, marched on campaigns and sometimes participated in battles. Although the army was the main force, a flotilla of hundreds of boats accompanied the troops on the rivers of the region under attack.

A typical order of battle in the open field consisted

of three armies. For example, at Kosovo Field in 1389, Sultan Murad I commanded the center with his janissary corps and spahi knights. By tradition the army of the region where the battle was fought occupied the right flank. Thus Bayezid I (c. 1360-1403), the sultan's son and heir, led the army of Europe on his right. A younger son led the army of Asia on the left flank. At Kosovo an advance guard of two thousand archers began the attack. However, the standard Ottoman practice was to begin battle with an inferior line of irregulars. The janissaries would attack accompanied by drums and cymbals and exhorted by their non-janissary brothers of the Bektashi dervishes. If the enemy forces outnumbered the Turks, the strategy changed, and the Ottomans would wait in hiding for the battle to begin.

The Ottoman forces, well suited for siege warfare, used both cannons and mines. They dug trenches about 1,500 meters from the besieged city walls and set up their artillery behind the ridges. Archers then continually rained arrows on the city, while janissaries scaled the walls. The Turks were willing to continue a siege as long as it took for a city to surrender or fall. They often gave generous terms of surrender, allowing those who wished to leave the city to go freely.

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Frederick B. Chary

The Mughal Empire

Dates: 1526-1858

Political Considerations

Geographical features have played a critical role in the history of warfare in the vast subcontinent now called India. The snow-covered Himalayas in the north protected India from massive military invasions. The protective Himalayan barrier has allowed Indian civilization to develop in an unbroken historical tradition that goes back well beyond five thousand years. The Himalayas are also the source of India's great rivers, such as the Ganges, which were vital for food and water supply, transport, and trade and along the banks of which civilization from ancient times developed.

Lower in height than the Himalayas, the Vindhya Mountains run from west to east, dividing northern India from southern India, known as the Deccan. Southern India developed a complex and unique civilization rich in art, language, literature, music, and religious traditions. Conquest of the wealthy Deccan became the goal of many northern rulers intent on reviving the political and administrative unification of India first accomplished by the Maurya Dynasty (321-c. 185 B.C.E.).

The Western Ghats, the Eastern Ghats, and other ranges of hills compartmentalize the Deccan into small, easily defended sectors. Here, the inhabitants built vast self-sufficient forts to ward off intruders, and it was in these regions that an Indian variation of guerrilla warfare proved to be the ultimate challenge to Mughal supremacy, particularly during the reign of the later Mughal rulers. The political fate of the north hinged on great battles fought by conventional forces on fields such as Pānīpat. In the south, however, the numerous isolated states sometimes held their own, and the conquering armies were frequently at a disadvantage because of unfamiliar terrain, hostile populations, and impregnable defenses.

India's considerable wealth was amassed through the toil of its rural and urban peoples, the fertility of its lands, the emphasis on trade, and the abundance of food from the subcontinent's land and surrounding seas. Conquest of India or even a lucrative raid into its wealthy northern cities became a significant aspect of the military strategy of rulers in Central Asia, Afghanistan, and Persia.

From early times Indians favored a remarkable tolerance of diversity and religious and cultural variety. The country became a haven for foreign refugees from persecution, who brought traditions, ideas, and skills that enhanced the economy and the way of life. The prevailing tendency was for foreigners, whether refugees or invaders, eventually to settle in after some initial upheavals and to adopt the prevailing way of life while retaining features of their own cultural traditions. The assimilation process was not always smooth, and military engagements were a common feature of the initial contact between Indians and alien invaders.

The Mughals, a Muslim people, began their Indian adventure as alien military raiders in 1526 and concluded it in 1858 as the last acknowledged Indian imperial dynasty. Their story aptly illustrates the process of assimilation. Even as they conquered India politically and militarily, they absorbed, adopted, and made Indian culture their own.

From ancient times Indians had experimented with a variety of forms of government, ranging from democratic republics to vast unifying empires. Although Indian rulers fought each other in a bewildering array of military engagements over politics, land acquisition, and personal ambition, Indian society was generally more oriented to the arts of peace than those of war. Although Indian society had a warrior class and professional soldiers, it did not glorify war as a way of life, seeing war as merely a necessity to accomplish a political end. This crucial feature of Indian development meant that alien military forces

frequently had enormous tactical advantages over defending Indian armies and frequently prevailed. The defenders, raised in a relatively nonviolent environment, fought with courage and valor but were frequently no match for the raiders. Hence India fell prey to frequent invasions that caused enormous turmoil until the process of civilizing and assimilating the outsiders took over. Occasionally, as with the Mughals, the invaders successfully utilized new military weaponry and innovative battle strategies in their bids to conquer India. In the process, they helped to change the methodology of warfare in the subcontinent.

As with most Indian governments, past and present, success and survival were largely dependent on the energy, determination, and dedication of a particular leader. The early Mughals produced a few outstanding rulers, the most prominent of whom was the emperor Akbar (1542-1605).

PRE-MUGHAL INDIA

Pre-Mughal India consisted of a number of small states governed by a variety of Hindu and Muslim rulers. One of the most prominent of these kings was Ibrāhīm Lodī (died 1526), the Afghan sultan of Delhi from 1517. These kings, princes, and tribal chiefs fought incessantly to increase the size of their territories, to protect their kingdoms, to carve out trade routes to the ocean, to ensure the succession of their children, and even to unify the subcontinent. Because the Delhi sultanate had lost most of its political significance, power dissipated into the hands of numerous regional warlords, many of Afghan and Rajput origin. The absence of political unity could easily have been perceived as creating an ideal opportunity for a hardy foreign adventurer.

THE REASONS FOR MUGHAL WARFARE

After establishing a foothold in India in 1526, Mughal emperors continuously sought to unify the country. The conduct of warfare was regarded as the necessary business of rulers through much of the Mughal period. Where they encountered resistance to peaceful takeovers, warfare followed.

The Mughal emperors waged war against religious groups that resisted hated measures such as a tax on non-Muslims. The religious fervor of some later Mughal rulers such as ʿĀlamgīr incited violent opposition from the Hindu majority throughout India. The Mughals also fought against religious minorities such as the Sikhs. Fratricidal warfare was a marked feature of this dynasty, with princes warring against each other for control of the empire because there was no established tradition of primogeniture, or inheritance by the oldest son. Mughal imperial governors also fought against recalcitrant tribes and ethnic communities opposed to their rule.

As the power of the Mughal emperors declined, rebellious noblemen and governors sought to carve out their own kingdoms. Warfare was a significant element of Mughal India. The combination of ethnic wars, religious wars, dynastic wars, and civil wars ensured that there were few periods of peace during this period.

TURNING POINTS

Apr. 20, 1526	Bābur makes effective use of artillery to defeat Sultan Ibrāhīm Lodī at the famous Battle of Pānīpat and establishes the Mughal Empire.
1527	The Mughals defeat the Rajputs at the Battle of Kanwa.
1529	The Mughals defeat the Afghans at the Battle of Ghāghara.
1556	Bābur's grandson Akbar is victorious at the second Battle of Pānīpat, against the Sur descendants of Shēr Shāh, and eventually conquers most of northern and eastern India, Afghanistan, and Baluchistan.
1632-1653	The fifth Mughal emperor, Shah Jahan, builds the Taj Mahal as a monument to his love for his wife Mumtaz Mahal.
1657	ʿĀlamgīr becomes the sixth Mughal emperor and ultimately expands the Mughal Empire to its greatest extent.
1739	Sack of Delhi by Persians.
1858	Mughals succumb to the British.

The wars of the later Mughal era were elaborate events involving thousands of soldiers, attendants, servants, camp followers, dancing girls, and vendors. The use of elephants, horses, oxen, and camels made for a uniquely Indian display of pomp and pageantry. The spectacle was enhanced with colorful costumes, decorative tents, and an impressive array of jewels and treasure chests.

MUGHAL INVASION OF INDIA

A descendant of both Genghis Khan (between 1155 and 1162-1227) and Tamerlane (1336-1405), Bābur (1482-1530) began as ruler of a small principality named Farghana, now located in Chinese Turkestan. By 1505 he had conquered the city of Kabul in Afghanistan, using it as a base for his ambitions on the wealth of India. Bābur's first raid into Punjab, in northern India, in 1524 was moderately successful. With the experience Bābur gained from this raid, he returned to India with a larger army and defeated Sultan Ibrāhīm Lodī at the famous Battle of Pānīpat on April 20, 1526.

Bābur's military successes were the product of his own expertise in the art of organizing a compact but well-trained, highly disciplined army for warfare in the plains of India. Bābur had additional advantages: His first-rate cavalry of Turkish troops was trained for quick maneuvers and sudden sallies and charges on opposing forces. Most important, Bābur made effective use of artillery, acquired from Turkey, in his Indian battles. The introduction of such weaponry played a decisive role in the Mughal victories. Although Indians had witnessed the use of large guns in sieges, the mobile artillery tactics of Bābur, using field guns and muskets, were a novelty.

OPPOSITION FROM INDIAN FORCES

Although Pānīpat was a significant battle that provided Bābur with control of Delhi and Agra, Bābur had to face stiff opposition from a variety of rulers. Fortunately for the Mughals, the Indians were unable to unite to defeat the invading army. The Rajputs and Afghans were separately and decisively defeated in the Battles of Kanwa (1527) and Ghāghara (1529). These victories were pivotal in the establishment of the Mughal Empire, which now extended from Afghanistan in the north to Bengal in the east.

The defending Indian forces lost because their armies were unwieldy and undisciplined. These forces ranged from cavalry to infantry, some of whom were peasants armed only with bamboo sticks. A veritable city of servants, camp followers, and attendants hindered the mobility of the defending troops, which were unable to march more than a short distance each day. The cumbersome size of this force and the absence of effective communication between different wings of the army made cohesive fighting difficult.

Indian armies relied on the use of war elephants, which served a similar purpose to tanks in modern warfare. Elephants could push forward large guns, carry the commander into battle, act as a battering ram against a fort, or crush opposing infantry underfoot by rushing into the ranks. Equipped with an iron chain in its trunk and taught to wield it in all directions, an elephant could wreak havoc against an enemy force. Although these great animals were impressive and could frighten an enemy, they were also unpredictable and could retreat under attack into the ranks of panicked Indian foot soldiers. Frequently commanders rode on the elephants so that they had the best view of the battlefield; this high perch made the commanders prime targets for enemy arrows. If the commander was wounded, or if he felt the need to descend from the howda on top of his elephant, his troops often assumed that he was dead and scattered.

Although the Rajput Indians did not initially have firearms, they fought the Mughals with valor and determination. When all hope for victory was lost, they donned their traditional saffron garments and embarked on their final death ride, fighting the enemy with a ferocity that made them legendary in Indian history. Rajput women often committed mass suicide rather than surrender to the invaders. The Rajput ideals of chivalry and courage in the face of defeat have inspired generations of Indians.

MILITARY ACHIEVEMENT

Bābur's strategy at the Battle of Pānīpat became a model followed by his descendants in numerous bat-

tles throughout Indian history. Bābur's strategy in this battle was to provide as much protection to his forces as possible while allowing them the opportunity to act swiftly to take advantage of enemy weaknesses as the battle advanced. Bābur utilized ditches and jungle foliage to guard his left flank, protecting his right with control of houses in Pānīpat. The front of his force was shielded by 700 baggage carts tied together with ropes and interspersed with a screen of shields behind which he stationed the squadrons armed with new matchlock rifles to fire at the Indian troops. The use of this new weapon was decisive and successful against the densely packed ranks of defending forces.

One tactical technique Bābur utilized was the *taulqama*, a Turkish word referring to the horns of the crescent, in which the Mughals closed in on and destroyed the rear guard of the opponent. Each soldier in the thoroughly trained Mughal army knew his place, in either the vanguard, left wing, right wing, or the all-important center commanded by Bābur himself. The combination of good defenses and mobility ensured that Bābur's troops could take advantage of every weakness in the ranks of the defending force. First, a determined hail of arrows was directed at the Indian elephants, which panicked and turned to flee, killing many of the defending forces. The disorder in Indian ranks was as decisive a factor as the new Mughal weaponry. A lethal combination, this led to death for Sultan Ibrāhīm Lodī and thousands of his followers, slain on the battlefield and during the invaders' consequent plunder and devastation.

Pānīpat heralded a new age of warfare in India and ensured that future Mughal rulers would rely increasingly on firearms in battles. Although Bābur had utilized hand weapons and some light guns stationed on forks, the need for large mortars soon became evident. Large guns were cast for Bābur in Agra and first used during the Battle of Kanwa. These huge guns were transported on baggage carts from one battle to the next. Deceit was a favored tactic: Wooden dummy guns were mingled with the real guns to provide the appearance of a vastly more powerful arsenal than Bābur actually possessed. Bābur's determination and tactical expertise secured for him most of northern India.

Bābur's son and successor Humāyūn (1508-1556) utilized a large gun on a swivel that could fire a ball of more than 4 pounds of weight at a distance of up to 3 miles. Humāyūn's son and the greatest of the Mughal emperors, Akbar, improved on the technology by using more wheeled artillery carriages. He also lengthened the barrel of the hand musket and made various improvements to the firearms used by his vast army.

Bābur barely had the opportunity to consolidate his Indian kingdom before his death in 1530. His son, Humāyūn, inherited the new empire but lacked his father's dedication and military genius. Humāyūn conquered important regions such as Malwa and Gujerat in 1535 but could not retain control. He had to contend with the determination of Afghani soldier Shīr Shāh (c. 1486-1545), who defeated the Mughal emperor at the Battles of Chausa (1539) and Kanauj (1540). Humāyūn became a refugee at the Persian Court.

Shīr Shāh, as much of a military genius as Bābur, consolidated his empire with a series of military victories, dying in 1545 during a siege. Humāyūn eventually reconquered part of his empire in 1555 but died the following year, leaving the country to his son Akbar.

Although Akbar was young, was inexperienced, and lacked validity for his imperial title, he nevertheless showed determination and valor. At the age of thirteen, he was victorious at the Second Battle of Pānīpat (1556) against the Sur descendants of Shīr Shāh, who were led by an admirable Hindu general, Himu Bhargav, also known as Hemu (died 1556). It is significant that at this battle Himu girded his war elephants in plate armor and stationed both musketeers and crossbow archers on their backs. Clearly, the innovative changes of the Mughal invaders were being adopted and adapted to traditional Indian methods of fighting. Himu was mortally wounded on the battlefield, which led to a rout of his troops and victory for the hard-pressed Mughals. This battle gave the Mughals control of the Punjab, Delhi, and Agra. Five years later, Akbar conquered the Ganges and Yamuna river valleys, Gwalior, and parts of Rajasthan.

The consolidation of his empire and expanding

personal ambitions continually drove Akbar to warfare and conquest. His Rajput opponents had not, in those early stages, acquired the use of firearms. With these weapons and with the Turkish tactic of using archers on horseback, the Mughals were largely successful. At the Battle of Gogunda, also called the Battle of Haldighat (1576), Akbar and his opponent, the heroic Rānā Pratāp Singh, ruler of Mewār between 1572 and 1597, both used elephants in battle. Rānā Pratāp lost the battle but retreated strategically to the hills, later returning to regain some of his lost territory. His efforts to survive Mughal rule provided im-

THE MUGHAL EMPIRE IN THE SEVENTEENTH CENTURY

Time & Life Pictures/Getty Images

Akbar, the greatest Mughal emperor, was continually driven to expand his empire through warfare and conquest.

portant lessons to later rebels about the validity of fighting wars of attrition against the imperial giant. Rānā Pratāp never surrendered to Akbar, and this conflict was only resolved when Akbar's successor made peace with the Rānā's son, Amar Singh, in 1614.

Akbar eventually conquered most of northern and eastern India, Afghanistan, and Baluchistan and then turned his attention southward, fighting his final campaigns in Ahmadnagar (1600) and Khandesh (1601). He is now regarded as one of India's greatest emperors, not so much for his military prowess as for his policies of religious tolerance and deliberate assimilation of ethnic groups and his careful administrative methods. Nationalist Indians have gone so far as to portray Akbar as the founder of Indian national consciousness, and this label reflects the admiration with which he is perceived.

Fratricidal conflict became a marked feature of Mughal political and military history with the rebellion from 1601 to 1604 of Prince Salīm (1569-1627), son and eventual successor of Akbar. Renamed Jahāngīr, Salīm took the throne upon Akbar's death in 1605 and ruled until his own death in 1627. Jahāngīr added Ahmadnagar and Kangra to the empire and subdued the Afghans in Bengal. Jahāngīr's encounters with the English and Portuguese failed to convince him of the need to take aggressive action to modernize his army; build a great fleet; and acquire the superior armaments, tactical knowledge, and training methods possessed by the English adventurers who sought to trade with his empire.

Jahāngīr's failure to appreciate the importance of modernization had devastating consequences for India, which eventually succumbed to the military might of the British and did not regain its independence until 1947. An absence of imperial concentration on Western military techniques, technology, and strategy resulted in long-term adverse political and economic consequences for India.

The fifth Mughal emperor, Shāh Jahān ruled between 1628 and 1658, when he was ousted from the throne by his son ʿĀlamgīr, and died a prisoner. Shāh Jahān is famous mainly as the builder of numerous palaces, particularly the Taj Mahal (1632-1653), a monument to his love for his wife. Militarily, he succeeded to an extent in the Deccan but failed in his numerous attempts to oust the Persians from Qandahār. His illness in 1657 triggered a fratricidal war between his four sons, who all vied to capture the throne.

ʿĀlamgīr emerged the victor, becoming India's sixth Mughal emperor and ruling until his own death in 1707. Elephants were used with great effectiveness in this succession struggle. At the Battle of Khajwa (1659), ʿĀlamgīr's brother and opponent Prince Shuja (died c. 1660) utilized elephants swinging large iron chains from their trunks, wreaking havoc among ʿĀlamgīr's troops. ʿĀlamgīr, however, remained calm and emerged victorious.

ʿĀlamgīr expanded the Mughal Empire to its greatest extent, east to Assam, south to the land of the Marāṭhās, and beyond to Thanjavur and Tiruchchirappalli. The territorial expansion of the empire proved to be the undoing of the dynasty. Government at this time was personality-oriented, relying heavily for stability and prosperity on the energy and initiative of the emperor. India needed a ruler dedicated to the administration and government of its varied peoples. The fervently religious ʿĀlamgīr, however, was determined to convert India to the Muslim faith. He discriminated against and persecuted Hindus, provoking their opposition throughout the empire.

The Hindu Marāṭhās revolted against Mughal intolerance, under the banner of their leader Śivajī (1627-1680), who used a combination of surprise attacks, guerrilla warfare, reliance on nearly impregnable hill fortifications, and the plunder of rich cities such as Surat to finance these rebellious operations. Śivajī was a military genius, particularly in the use of cavalry. The Marāṭhā revolt, now legendary for its audacity against Mughal power, was somewhat successful in that Śivajī declared himself king of the Marāṭhās in 1674. The creation of this Hindu kingdom in defiance of the various Muslim rulers, including the Mughals, inspired the country's Hindu majority to stage other revolts. Śivajī is remembered for his ideals, his daring, and his administrative and military genius as one of India's greatest heroes.

Religious oppression also roused the Rajputs, the Sikhs, and the Jats against the increasingly unwieldy Mughal Empire. Rebellion flared up in various states such as Assam, Bundelkhand, Malwa, and Patiala. ʿĀlamgīr's success in ruthlessly suppressing these revolts generated widespread hostility to Mughal rule throughout India. Between 1681 and 1707, ʿĀlamgīr also fought a financially expensive war to subdue the Deccan, which drained the empire's once-wealthy treasuries.

ʿĀlamgīr's use of the Mughal army and his country's wealth to pursue a policy aimed at converting all of India to Islam was in stark contrast to the more pragmatic, self-interested liberal tolerance practiced by Akbar. India resisted the intolerant Mughals with determination, and the consequent warfare created dynastic insecurity, political instability, and a power vacuum that was energetically exploited by British adventurers seeking to expand the British Empire into the subcontinent.

ʿĀlamgīr was so obsessed with his persecution of the Hindu majority that he failed to grasp the significance of the European military threat and did not comprehend the need to build a strong Indian navy to match those of England and France. European nations controlled the oceans and this would be a fatal weakness for India.

This tactical error contributed to the loss of Indian independence, to its political takeover, and to its economic and financial degradation during European colonial rule. Unlike earlier invaders and conquerors, the British had no intention of assimilating into Indian civilization and saw India primarily as a source of wealth, raw materials, and markets for their homeland. This perception became more significant as Britain led the world in industrialization and India's wealth became vital to British economic survival, imperial expansion, and global wars with other European colonial powers. ʿĀlamgīr effectively destroyed loyalty to the Mughal Empire, and, after his death, weaker emperors could not recapture Akbar's earlier tradition of toleration. The Mughal Empire collapsed under a series of internal revolts, fratricidal conflicts, and determined pressure from the British East India Company, which was founded in 1600 as a trading agency and went on to acquire a vast empire in the subcontinent.

WEAPONS, UNIFORMS, AND ARMOR

The Battle of Talikota (1565), considered one of the most decisive battles in this period of South Indian history, demonstrated the importance of having well-armed, appropriately dressed troops in combat. The forces of the southern state of Vijayanagar commanded massive numbers but failed to equip their men with armor or even practical clothing. The Indian infantry, with their bamboo bows, short spears and swords, and foreign mercenaries wielding outdated artillery and muskets, were no match for the Deccan sultans who rode on Arabian horses, their armor-clad Iranian and Turanian soldiers carrying

steel bows, metal javelins, and 16-foot lances. Additionally, the Muslims had mobile artillery carried on camels and elephants. Bābur's tactic of using supplies as a wall of protection for the front line of gunners was utilized once again. Historians estimate that the defeat of Vijayanagar resulted in the deaths of 16,000 troops. The great southern empire of Vijayanagar and its capital were destroyed by the invaders.

Indian warriors did not readily adopt the use of firearms during warfare. The Rajput ruler Maharaja Jaswant Singh (died 1678) would not use firearms in the Mughal War of Succession (1658-1659) against ʿĀlamgīr, because he felt such weaponry was not worthy of his heroic people.

During the Mughal era, the efficiency and range of firearms improved considerably. The rather crude primitive guns of Bābur's day were replaced by more accurate, sophisticated weapons, mounted on individual carriages pulled by bullocks. Indian artisans were able to copy the latest guns for their customers with a facility that would later amaze the Europeans. Shīr Shāh, recognizing the importance of the new technology, trained and used over 25,000 matchlock men in his army. Akbar took care to import and copy the latest weaponry from Europe, and eventually infantry were equipped with guns rather than spears. Indian commanders during the eighteenth century also used field glasses to survey the battlefield.

MILITARY ORGANIZATION

Although Bābur took over India with a brilliant combination of strategy, tactics, discipline, and innovative weaponry, his successors had to fight continuously to consolidate the empire he had founded. Constant warfare became a fixed feature of Mughal history, and there was accordingly a great emphasis on the organization of the military. Bābur's contribution to military organization lay in his introducing India to a new type of warfare that included significant reliance upon firearms. His emphasis on a highly mobile cavalry ensured victories in every major battle. His determination to protect his forces while enabling them to fight ensured that his archers and matchlock soldiers inflicted enormous casualties from behind the defensive positions erected for them. His army, however, lived largely off the land in those early years of plunder and pillage.

Later emperors required a more constant and less controversial method of funding their military ventures. The six years of interlude in Mughal rule when Shīr Shāh governed India ironically provided the administrative foundations for the Mughal Empire. Now regarded as a genius in administration, Shīr Shāh divided the Indian Empire into districts for revenue purposes, established a sound currency, encouraged trade and commerce, constructed highways and ensured their safety with an elaborate police system, reformed the criminal justice system, and instituted direct recruitment of and regular payment to young men who joined the imperial army, thereby decreasing reliance on the cumbersome system of seeking military assistance from regional lords. Clearly, such reforms facilitated the recruitment, payment, and utilization of imperial armies to their maximum potential, a fact not lost on Akbar, who adopted many of these ideas.

Akbar is also credited with the *mansabdari* organization of the army, in which all military and civilian officials were classified on the basis of a salary scale and on their formal requirement to maintain and provide cavalry contingents for the emperor's wars. The recipients, called mansabdars, lived off the revenue of land grants called *jagirs*, which were not hereditary and were often transferred. Akbar encouraged Hindus to join both his armies and his government as bureaucrats and ministers. The emperor posted both a civilian governor and a military commander to each of the fifteen provinces of his empire. Military officials also participated in district government. With land grants, titles, and a variety of perquisites, Akbar created a multiethnic, multireligious nobility consisting of Central Asians, Iranians, Afghans, Rajputs, and Indian Muslims who were loyal to their emperor. Akbar was careful to ensure that no ethnic or religious group dominated his government.

During the early phase of this empire, the battle strategies of most Mughal engagements were quite similar. A strong, disciplined, well-equipped force handled the artillery. Archery from horseback created confusion and havoc in enemy ranks. The main

Hulton Archive/Getty Images

The Second Anglo-Sikh War (1848-1849) ended with British control of the Punjab and India's northwestern regions. Late Mughal intolerance of religious minorities, including the Hindus and Sikhs, deflected attention from the real threat: British colonialism.

army usually consisted of left, center, and right wings. The commander controlled the center. At the rear were commando-style reserve forces utilized to defend any wing that came under excessive pressure. Following initial resort to artillery, most of the engagement was by hand-to-hand combat.

The organizational methodology of the Mughals was borrowed from the Turks and was adapted to the prevailing situation of terrain, weather, and size of opposing forces in India. However, the sheer wealth of the Indian Empire and the complex diversity of its people eventually necessitated the creation of a vast military bureaucracy with noncombatants outnumbering soldiers ten to one. Although the Mughals had conquered India with compact, highly mobile, well-equipped, and well-armed troops, as they settled in to govern India, each military action involved the transportation to the field of a growing retinue of baggage, suppliers, messengers, servants, dancing girls, clerks, spies, shopkeepers, money-lenders, and camp followers along with the soldiers who did the actual fighting.

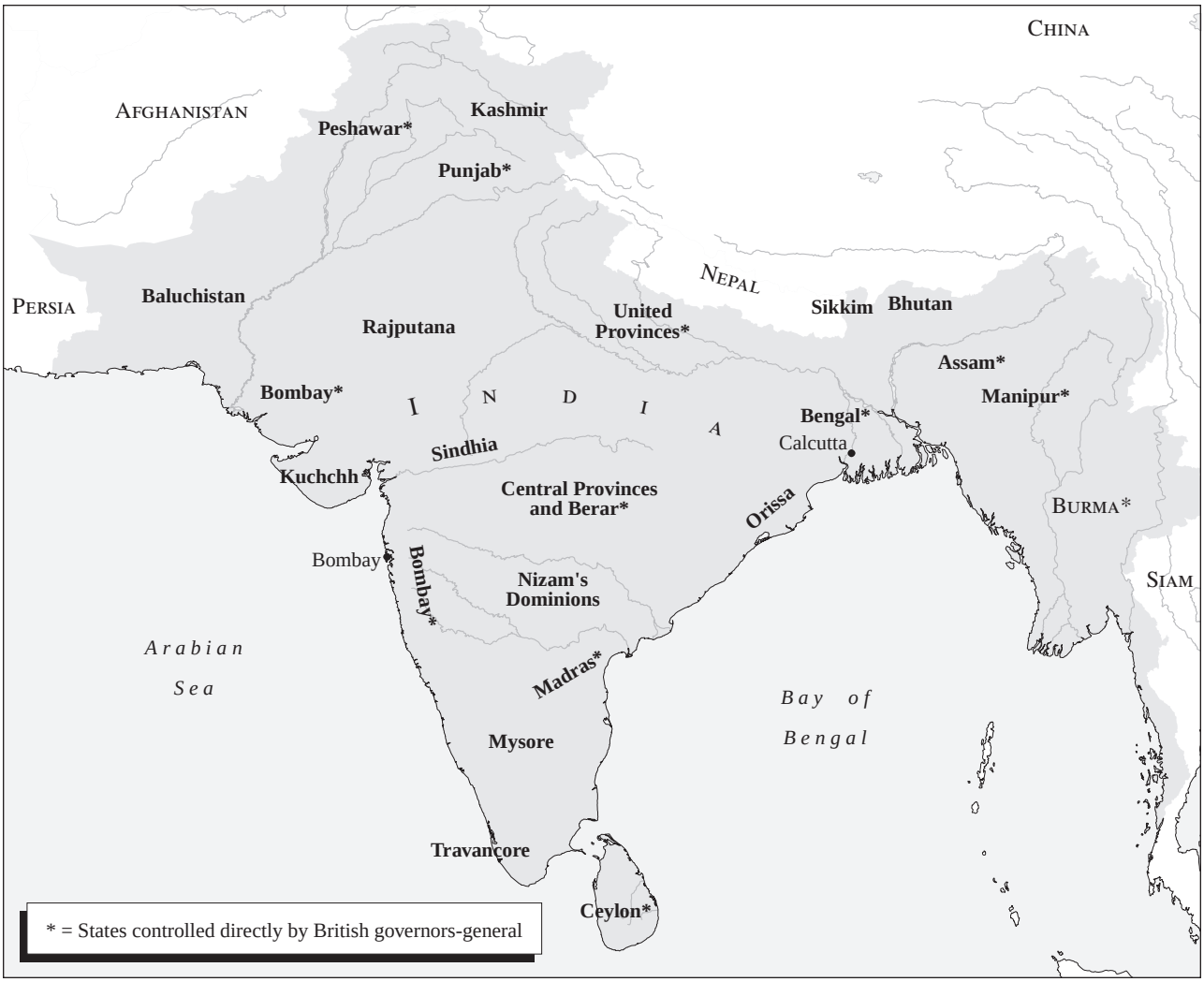
A century after Bābur seized India, the Mughal army of combatants had grown sixfold. This enormous increase in size was partly a result of Akbar's policy. The growth in numbers of combatants required a corresponding increase in the number of servicing staff for the armed forces. However, what the Indian army gained in bureaucratic organization, it lost in maneuverability and the ability to strike sud-

denly at an unprepared opponent. So vast a crowd could not move more than a few miles per day.

Bābur used Asiatic Muslims and Persians to fire his large guns. Employment of European and Indo-European mercenaries to handle the gunnery work during battle became a significant feature of Mughal military tactics during Akbar's reign. No longer were Persians and Asiatic Muslims utilized as much. Hence the Mughals relied on outsiders in a critical aspect of their strategy. Although there were many European and Central Asian adventurers eager to work for the Mughal government, these mercenaries were detrimental to the welfare of the Mughal Empire, because they frequently changed sides, plotted constantly against their employers, and even deserted on the battlefield.

The spate of revolts fired by ethnic, religious, and other forms of oppression adversely affected state revenues by increasing the number of wars that had to be fought at the very moment when Indians were no longer contributing as generously to the Mughal treasury. As the empire declined, soldiers were not paid regularly and often revolted because they were hungry and their families were starving. The Mu-

BRITISH INDIA AT THE END OF THE NINETEENTH CENTURY



ghals had retained the inherently feudal structure of their armed forces, which meant that the soldier's primary loyalty was to his own lord rather than exclusively to the emperor. This arrangement endangered cohesion in later conflicts and increased disorganization and a lack of discipline among the ranks. A number of scholars have suggested that the failures in the Deccan destroyed the reputation of the once-great Mughal army, the decline of which eventually led to the end of the Mughal Empire.

The Persian invasion of India by Nādir Shāh (1688-1747) in 1739 resulted in the Sack of Delhi, the slaughter of 30,000 Indians, and the transportation to Persia of vast booty. This was the low point of Mughal rule, and the dynasty finally ended in 1858 when the British, following the Indian revolt of 1857, imprisoned the nineteenth Mughal emperor Bahādur Shāh II (1775-1862) in Burma and shot and killed his two sons and grandson.

DOCTRINE, STRATEGY, AND TACTICS

Early Mughal leaders were committed to warfare as a means of conquering India and regarded the exercise of war as a normal activity of kings. Later Mughals did not match their doctrinal dedication to war with any great emphasis on ensuring that the army remained a tough, well-disciplined fighting force. The Mughal Dynasty, which had won a wealthy empire with a few thousand hardy followers, lost its military focus and dedication after succumbing to the luxury and opulence reaped from the resources of India.

Although most Mughal battles were fought on land and consisted of a variety of strategies and tactics suited to the particular terrain of the battlefield, the imperial fleet was occasionally utilized, as in the Battle of Daulambapur (1612). The Mughals won this battle with artillery and well-trained marksmen.

Warfare played a crucial role throughout the long history of Mughal India. It was the method by which the Mughals gained India and ironically it was their incompetence in warfare that cost them their empire. The Mughals were the product of a military tradition and utilized India's vast wealth to further their imperial ambitions to conquer the whole subcontinent. Their rule brought greatness to India politically and militarily and may have created a latent Indian consciousness among the hordes of Turkish, Afghani, Persian, Rajput, Sikh, Marāṭhā, and numerous other groups that had made India their homeland. In the end, the failure of Mughal rulers such as ʿĀlamgīr to appreciate the value of this cultural and religious pluralism doomed the Mughal Empire. The nascent national outlook fostered by Akbar would have to wait a few hundred years for Mahatma Gandhi (1869-1948) and Jawaharlal Nehru (1889-1964) to create a nation from the descendants of the Mughals and all the other peoples who came to India.

CONTEMPORARY SOURCES

The Bābur-nāmeh (early sixteenth century; *Memoirs of Bābur*, 1921-1922), the memoirs of the first Mughal emperor Bābur, are available in translation and provide a firsthand account of his perceptions. Additionally, numerous contemporaries of the Mughals wrote detailed accounts of the battles in both the Persian and Indian languages. Some of these records of military engagements have been translated or summarized into English and provide a vivid first-person view of warfare during this era.

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R. K. L. Panjabi

African Warfare

Dates: c. 1500-1935

Political Considerations

From the sixteenth to the late nineteenth centuries, sub-Saharan Africa underwent drastic change, evolving from a continent of empires, kingdoms, states, and city-states to a continent under European domination. Although some sixteenth and seventeenth century African groups were living in stateless societies, most tended toward centralized states with significant military institutions. Powerful empires and kingdoms included those of Songhai, Oyo, Benin, and Bornu-Kanem in West Africa; Bunyoro, Buganda, and the Swahili city-states in East Africa; the kingdoms of the Kongo, Lunda, Luba, Changamire, and Mwanamutapa across Central Africa; the Funj Sultanate in the Sudan; and the Kingdom of Ethiopia.

Major causes of warfare were for the control of trade routes, including rivers and lakes, and of markets and agricultural and grazing land. Other causes were for the subjugation of peoples to serve as workers, soldiers, and taxpayers. There were hostilities along the west coast of Africa for control of international trade. Some wars were waged to consolidate power. Others, such as the Islamic jihads, or holy wars, in West Africa, involved religion, although most also had underlying economic or political considerations. In the nineteenth century African states warred against one another, but these confrontations soon were replaced by wars of resistance against European imperialism.

There is little consensus among historians concerning the relationship between the slave trade and warfare. During the 1500's Portugal expanded into Angola and Mozambique, disrupting existing states, seizing land and slaves, and initiating Africa into the Atlantic slave trade. Other European nations followed, and in the subsequent three hundred years, millions of Africans were enslaved or died in the Americas. An accurate assessment of the slave trade as a cause of war is difficult, because there are insufficient records. There were states, such as Dahomey, that went to war to obtain captives to sell to Europeans, but historians also have demonstrated regional and local causes for many African hostilities, such as the Yoruba civil wars of the nineteenth century. There is agreement on one point: In virtually all wars, regardless of their causes, captives were sold to Europeans as slaves, often in exchange for firearms.

In this environment of increased warfare, some kingdoms disappeared and others grew, as centralization emerged as a strategy for both expansion and defense. By the eighteenth century political and economic patterns had shifted. The savanna region of West Africa declined, as trade routes moved southward to forest states, such as Asante, Benin, and Dahomey, where commerce was linked with European merchants. In the nineteenth century there was a revival of state-building in the savanna region, as a series of jihads created new governments under Islamic law. The states of Futa Toro and Futa Jalon emerged in the west, and the Hausa city-states in northern Nigeria coalesced into the Sokoto caliphate. By mid-century the Tukulor Empire of ʿUmar Tal (c. 1797-1864) and the Mandinka Empire of Samory Toure (c. 1835-1900) had also emerged as expansionist states with powerful military establishments. The Mossi states, significant since 1500, became more centralized and used their cavalry to resist Islamic expansion and avoid conquest. With the collapse of the Oyo Empire in the early 1800's, the Yoruba states underwent a series of civil wars that lasted almost to the end of the century. States, such as Ibadan, attempted to fill this power vacuum and adjust to changing economic conditions, as Europeans encroached along the coast.

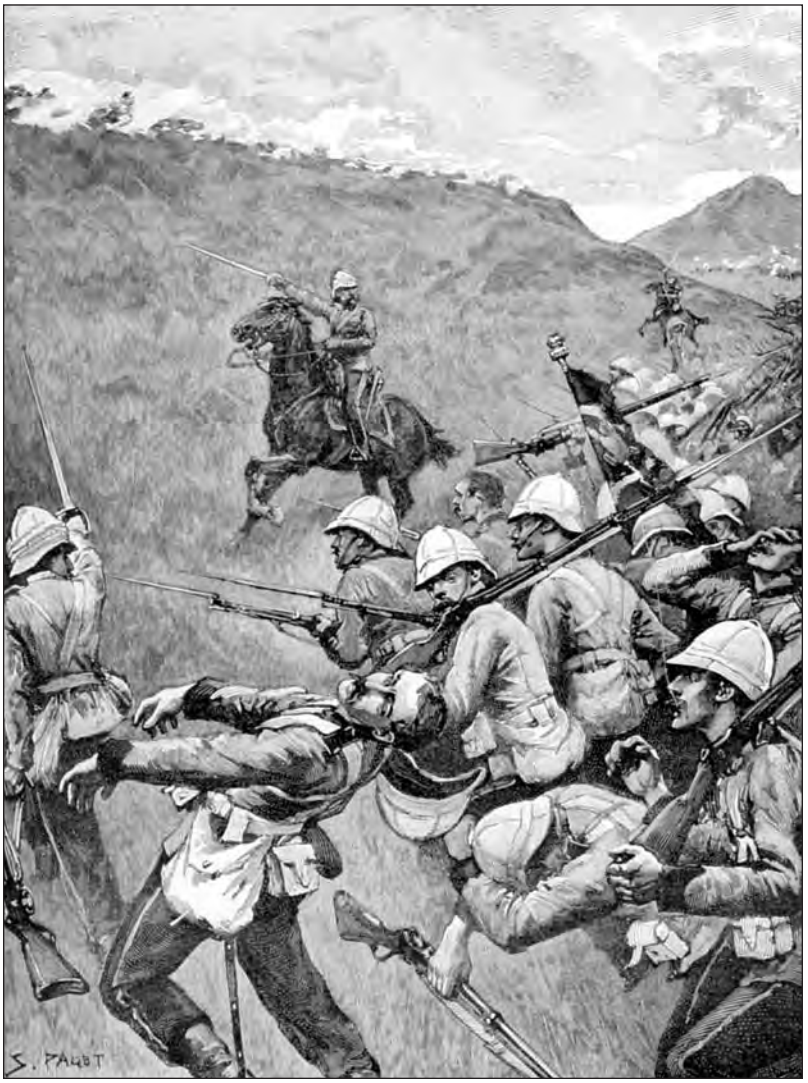
In East Africa, Swahili economic and military

power grew as city-states were unified. Buganda remained a power in the lakes region. Ethiopia developed a more centralized monarchy and, with the aid of European firearms, began to expand and absorb its neighbors.

In Central Africa the Lunda, Kuba, Lozi, and Bemba kingdoms remained significant powers, as did the Ovimbundu kingdoms in Angola. The Luba kingdom in the central Congo became an expansionist state with a centralized administrative structure. There was violent competition for control of the long-distance trade routes that were used to transport slaves, ivory, copper, and salt. There was also competition for arable land. By the 1860's the decline of the Atlantic slave trade and the increased availability of firearms intensified the struggle for the remaining commerce.

Nineteenth century warfare was more intense in southern Africa than elsewhere on the continent. In the late 1700's population growth and a series of droughts had created a famine. Nguni chieftaincies began fighting over grazing land, initiating an era of great turmoil, the *mfecane*, or "crushing." Warfare and mass migration affected all of southern Africa, and small chieftaincies were integrated into larger entities. With its revolutionary military tactics, the Zulu kingdom emerged as the most significant African power in the region. Other groups, such as the Swazi and Sotho, consolidated chieftaincies into kingdoms for defensive purposes. Unable to resist the Zulu expansion, some Nguni groups fled northward. Mzilikazi (c. 1790-1868), an earlier ally of the Zulu, also fled north; engaging in Zulu-style warfare, he established the highly centralized Ndebele kingdom in present-day Zimbabwe. Wars continued through the nineteenth century, as the English and the Afrikaners, descendants of Dutch settlers, entered into a three-way struggle with the African states for control of South Africa, resulting in some of Africa's most famous battles: Blood River (1838), Isandhlwana (1879), and Ulundi (1879).

Throughout the nineteenth century, African kingdoms experienced a complex interplay of local, regional, and international forces. Economically, there was a dramatic shift



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The British attempt to subjugate the Afrikaner settlers in southern Africa during the First Boer War, 1881.

P. F. Collier and Son

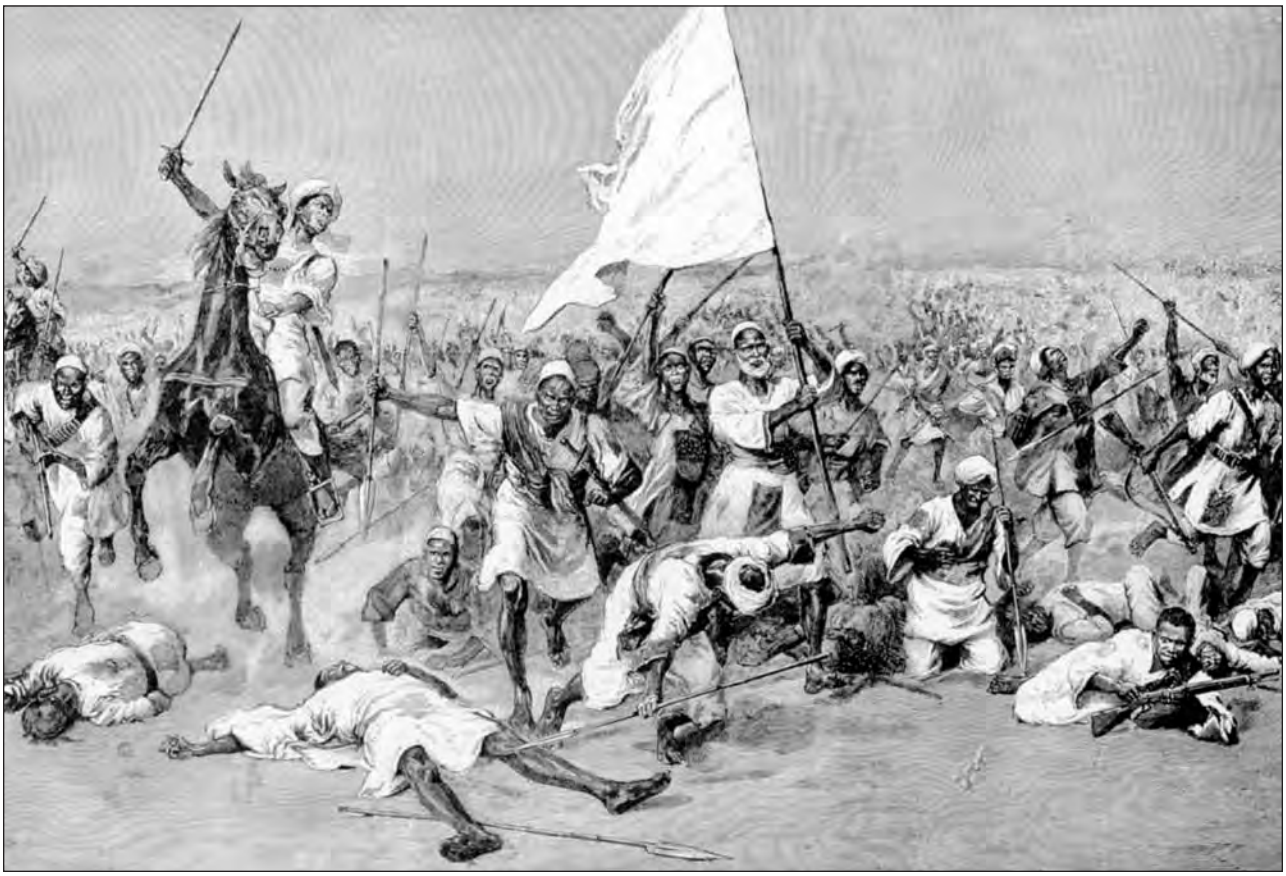
British troops advance on the Zulus at the Tugela River in 1900.

away from the Atlantic slave trade toward the so-called legitimate trade, with a corresponding rearrangement of economic patterns and power balances. Politically, the process of centralization continued unabated in most parts of the continent. The integration of groups into larger, more centralized political entities provoked conflict and warfare, but in some cases promoted wider security and stability. The ending of the overseas slave trade, however, corresponded with the beginning of European imperialism. The development of African states and their subsequent increase in military prowess did not prevent the onslaught of European imperialism, but it did enable many African states to fight intense wars of resistance, such as the heroic efforts of the Mandinka and Dahomey kingdoms against France. The Zulu, Asante, and Benin kingdoms raised similar resistance to English imperialism. Ultimately futile, this resistance inspired subsequent generations, and in some instances, provided the basis for resistance to colonialism. Ethiopia escaped conquest when its emperor Menelik II (1844-1913) defeated the Italian army at Adowa (1896). However, it later succumbed to the firepower and poison gas of Benito Mussolini's army in the second Italo-Ethiopian War (1935).

Military Achievement

Between 1500 and 1900 the evolution of African warfare corresponded with the increasing centralization of African kingdoms, states, and empires. Centralization increased control of trade and resources that were used for further expansion. Conquest augmented the human and material resources for state formation, empire building, and consolidation of power. By the nineteenth century such consolidation had led to the economic integration of various regions of Africa.

West African states north of the rain forest were able to purchase horses for cavalry. Some smaller



F. R. Niglutsch

In 1896, the Mahdist state of ʿAbdullāh et Taʿāʾisha proclaimed a jihad and used extensive cavalry units to force Egypt out of the Sudan.

horses were bred locally, but the larger horses used by heavy cavalry had to be imported from North Africa. In many cases horses were obtained through trade of slaves. In the savanna regions cavalry became the most important aspect of their militaries, such as that of the Sokoto caliphate, which could put a cavalry of more than 25,000 on the battlefield. Neighboring Bornu-Kanem could field a cavalry of 7,000. In the central Sudan the Funj sultanate used cavalry to defeat the Christian kingdom of Alwa and maintain two centuries of control prior to Egypt's invasion (1820-1821). Later in the century the Mahdist state of ʿAbdullāh et Taʿāʾisha (1846-1899) proclaimed a jihad and used extensive cavalry units to force Egypt out of the Sudan. Cavalry dominated the military in the expansive region stretching from western Senegal to the Sudan. Only the expanded use of firearms in the second half of the nineteenth century reduced its effectiveness.

The Islamic jihads of the nineteenth century transformed much of the savanna region of West Africa, not only by creating religious unity but also by politically integrating previously fragmented groups. Islam was spread widely throughout many of the region's rural populations. The implementation of Islamic law was accompanied by a significant spread of literacy, and in some cases, greater economic security. Trade linkages also were established with the wider Islamic world.

In both East and Central Africa consolidation of state power allowed for the exploitation of a wide range of natural and human resources. Local trade

networks were linked to long-distance routes, bringing products from remote regions into a wider market arena connected to both the Atlantic and Indian Oceans. Along the East African coast, trade was dominated by the Swahili, who conducted armed caravans into the interior, developed long-distance commerce, and established Kiswahili as the lingua franca, or common language, of eastern Africa.

Although the consolidation of territory and governance and the expansion of economic relations were important accomplishments, two more overarching achievements of the African states and their militaries were realized in the years from 1500 to 1900. The first was the prevention of foreign occupation of African territory from 1500 to the 1870's. By the latter date only 10 percent of African territory, mostly in South Africa and Algeria, was under direct European control. Although diseases and other factors contributed to this state of affairs, the strength of African kingdoms and empires played a major role. Even during the era of the devastating slave trade, Africans were able to control the terms of trade and limit Europeans to small fortifications on the west coast.

The other important achievement was the powerful resistance of many African states to nineteenth century European imperialism. For many reasons, such as superior European military technology and logistical support, the use of African troops against each other, and the inability of African states to form alliances, the resistance was doomed to fail. Nevertheless, the era of resistance not only gave African people a sense of pride but also fostered the development of political and ethnic identities. Dahomey resisted French armies for four years. Although the massive, heavily armed British-Egyptian force defeated the Mahdist state at the Battle of Omdurman (1898), the foundations had been laid for Sudanese nationalism. In southern Africa political and economic turmoil also created broad-based ethnicities. Despite defeat by the English and exploitation by the Afrikaners, the concept of Zulu nationhood had been established; today, the Zulu are South Africa's largest ethnic group and a political force of considerable importance. The founder of the Sotho kingdom, Moshoeshoe (c. 1786-1870), used remarkable diplomacy and military acumen to develop armed mountain fortifications that survived Zulu and Afrikaner depredations; his kingdom emerged as the independent nation of Lesotho in 1966. With their defensive positions, diplomacy, and Zulu-style military organization, the Swazi consolidated chieftaincies into a kingdom that maintained its territorial integrity and emerged as the independent nation of Swaziland in 1968. These are but a few examples. The memory of the resistance survived in oral tradition and continues to play a large role in contemporary African historical writing. It provided a historical and psychological frame of reference in the nationalist struggles for freedom and established the foundation for future nationhood.

Weapons, Uniforms, and Armor

In the period from 1500 to 1900, African weapons underwent slow, evolutionary development, until modern firearms were introduced in the mid-nineteenth century. In many African societies, weapons were part of a complex cultural system and were imbued with social, cultural, and religious, as well as military, significance. For example, amulets for spiritual protection were worn in leather pouches around soldiers' necks, were tied to uniforms, or were attached to weapons. Islamic soldiers wore small pouches with pieces of paper inscribed with verses from the Qurʾān.

African weapons types varied according to the geographical regions of their use. In the forest areas of West and Central Africa and the open veldt of southern Africa, infantries used throwing spears, multipointed throwing knives, and less common projectile weapons such as darts, slings, and throwing clubs. Infantry assault units carried shields and shock weapons: swords, clubs, axes, daggers, and spears.

Infantry units often were organized according to the weapons they carried. Typical examples were archer units, such as those of the Mossi and Luba. Archers provided long-range firepower, especially in open areas. Bows ranged in size from 2.5 to 5 feet in length, with a 40- to 50-pound draw and a general range of 75 yards. Arrows had iron-headed shafts that were sometimes dipped in poison.

Swords were among the most common weapons used by both infantry and cavalry units. These weapons had two-edged straight blades or curved blades. Most were manufactured locally, but the blades themselves were often imported. Swords used in the forest regions tended to be shorter in length. All cavalrymen carried a short sword for use after spears had been thrown or lost.

Infantries and cavalries made extensive use of the spear, which was the most commonly used weapon. Spears were differentiated by their functions: Lances were used for thrusting, whereas javelins were used for throwing. Six-foot lances were carried by heavy cavalry and used in shock assaults. Javelins were used by the more mobile light cavalry, with each rider carrying a supply of the weapons. The most significant revolution in such weaponry occurred in South Africa, where the Zulu converted their long throwing spears into shorter, stabbing weapons; protected by heavy shields they advanced rapidly and engaged the enemy at close quarters.

Firearms were introduced into West Africa in the sixteenth century by North African Muslims and by Europeans on the coast. Early weapons were mostly flintlock muzzle-loaders, which became part of the trade cycle of guns, gold, and slaves. During the 1700's musket use spread among coastal and forest states, such as Dahomey, Benin, and Asante. Firearms helped these states dominate their neighbors. In the rest of Africa, firearms spread slowly until the 1850's when modern weapons were introduced.

The overall impact of the musket on African armies was limited. Guns and gunpowder of the eighteenth and early nineteenth centuries were poor and unreliable. Muskets were insufficiently maintained and were difficult to reload quickly without considerable training. They were inaccurate because they were shot from the hip. Coordinated firepower was rarely used. There is no evidence that the use of muskets increased the death rate, or that they were always decisive against enemies without firearms. In 1726 an Oyo cavalry without firearms defeated a Dahomian force armed with muskets. Despite these limitations, the intense sound of firearms created psychological terror in the enemy. In eastern and southern Africa and Ethiopia, firearms had even less impact on warfare than they had elsewhere. In Central Africa muskets were most often used by slave-raiding parties.

After 1850 modern firearms were made available in Africa, where obsolete European guns were sold as more effective weapons were produced on the European continent. Breechloaders such as the single-

Library of Congress

Uniforms of nineteenth century French soldiers in Algeria: infantry (left) and cavalry.

shot Snider were used in West Africa. Eventually, repeating rifles, such as the Winchester, were also used. Other firearms sold to African states included the Snider-Enfield, Martini-Henry, Chassepot, Mauser, French Gras, Lee-Enfield, and French Lebel models. Although Europeans sold these weapons by the thousands, they were reluctant to sell machine guns and artillery to African states, with the exception of Ethiopia. Some artillery was captured from European armies, but its availability and usage was limited. Overall, Africans failed to take advantage of modern firearms. Their courage and high morale allowed them to resist the European onslaught, but they could not prevail.

Throughout Africa soldiers wore distinctive uniforms for identification, protection, and mobility. The most elaborate uniforms belonged to the standing armies; the least formal were worn by the "citizens' armies." Soldiers of the Mandinka Empire wore conical straw hats, rust-colored trousers, and leather sandals; officers were identified by red turbans. Ethiopian soldiers wore trousers and knee-length tunics with bands tied around the waist. Cavalry troops wore long Islamic-style robes for lightweight protection from the sun. Throughout West Africa military jackets were common, as were long or short trousers with apronlike coverings. Troops in hot, dry regions usually wore sandals; in forest areas and in southern Africa, soldiers usually went barefoot.

Many African soldiers wore hats or helmets for protection and identification. Protective devices ranged from metal helmets in Benin and Ethiopia to strips of rolled cloth tied in turbans around the head. Other headgear was made of tightly woven palm fiber or heavily quilted cotton.

The shield served as the basic armor for the infantry and some light cavalry. Shields were made of animal hide, wood, or tightly woven grass. They varied in size and shape and sometimes reflected the social status of the user. Ethiopians placed high value on elaborately decorated shields. In southern Africa shield-making was a specialized craft. Oval-shaped Zulu shields, made from thick cattle hide, were 5 feet long. When infantry advanced in close order, shields were raised; when hitting the enemy line on the run, shields produced a shock effect on the enemy's defenses. As the use of firearms spread, the use of shields declined.

Units of heavy cavalry, such as those of the Sudan, wore armor made of quilted cotton that was padded with fiber. Armor covered both man and horse. In some areas imported chain mail also was used. Not all heavy cavalry wore armor, as it was expensive, cumbersome, and reserved for the most elite units. Other armor included metal breastplates, padded jackets, and leather aprons worn around the waist.

Military Organization

Given the diversity of African civilizations, military organization took a wide variety of forms. Historian Bruce Vandervort describes four types of organization used by African states and empires. All were hierarchical systems. The first type included armies in which recruits were summoned locally or regionally to serve as discrete units within the military structure. In Ethiopia, for example, regions supplied military units that were under almost feudalistic local control; after 1855 the centralized monarchy commanded a more national army, with each unit representing its individual region. The armies of Dahomey, Benin, and Asante were similar in form. Some Islamic states, such as the Tukulor Empire, also had regional armies under central command; soldiers were under royal control but served under officers from their own regions.

In the second type of military organization, exemplified by that of the Zulu, individual soldiers from various regions were integrated into preexisting units. While under arms they lived, trained, and fought together, although they represented different regions or groups. Zulu kings Dingiswayo (c. 1770-c. 1818) and Shaka (c. 1787-1828) changed the military's traditional structure, transforming the Zulu age groups into military units. Age groups were composed of young men who underwent a common circumcision ceremony and initiation rite to enter adulthood. With growing military threats, the Zulu leadership did not want its young men to be far from home during this initiation. Instead, young unmarried men were placed in regiments with others of

their age range. They were barracked in military settlements near royal households and became part of the Zulu standing army under direct control of the king. Additional youth were easily integrated into the units. They bonded by living and training together into a fighting force. The officers, or *indunas*, who replaced traditional territorial chiefs, were appointed by the king. The Ndebele instituted a similar system, in which soldiers served not under officers from their own region but under commanders who were part of a rigid hierarchy.

A third type of military organization was the "citizens' army," in which all physically able males were expected to bear arms during times of war. These levies commonly served as infantry under local officers and usually were required to bring their own weapons and provisions. Using this model, Mai Idris Alooma (r. 1571-1583) of Bornu-Kanem was able to put more than 100,000 soldiers in the field. This general call-up system was common throughout West Africa.

The fourth type of military organization was the standing army of professional soldiers. Earlier African armies had been loosely composed of units called up for specific purposes; by the nineteenth century there was a parallel development in the growth of centralized governments and the expansion of standing armies. Early examples were Bornu's standing unit of musketeers and Oyo's professional war chiefs. Later examples included Ethiopia and Dahomey and the Zulu, Tukulor, and Mandinka empires.

The roles of slaves in African armies varied. Because of the potential risk in arming slaves, many states used them only for transport. Most typically, slaves were used as soldiers in infantry units in the Islamic states of West Africa's savanna regions. The states of Bornu-Kanem and Sokoto made regular use of slave-soldiers, and Samory Toure integrated enslaved riflemen into Mandinka infantry units. In the nineteenth century some Yoruba states also used slaves as soldiers.

Military structure also varied in terms of balance between different types of units. In West Africa's open savanna regions the main force was cavalry, usually supported by infantry. The cavalry was an elite corps, sometimes forming a military aristocracy. The supply of horses and tack was shared by the king and the territorial leadership. Some cavalries were divided into light and heavy units, based on the type of horse and the military objective. Cavalry units tended to have more autonomy with territorial leadership, whereas infantries were more hierarchically structured under a centralized command.

In the forest areas of West Africa, armies relied primarily on infantry, because horses could not survive the sleeping sickness carried by the tsetse fly that was prevalent throughout the region. Infantries were divided into units of men wielding different weapons such as spears, swords, or bows and arrows. Some infantrymen carried muskets, but in the nineteenth century more modern firearms appeared. The use of firearms by infantry was most prevalent among the forest states.

In addition to land forces, some African states maintained fleets of war canoes and plank boats. They were used for transport and assault on rivers, lakes, and lagoons. Most were small and maneuverable, but larger canoes were 100 feet long, with a seating capacity of 100 soldiers. The Songhai made such extensive use of their Niger River canoe fleet that they appointed a naval commander. The Zambezi, Gambia, Senegal, and Congo Rivers were also sites of canoe warfare. The Buganda kingdom, known for its canoe fleet, was considered a naval power on Lake Victoria.

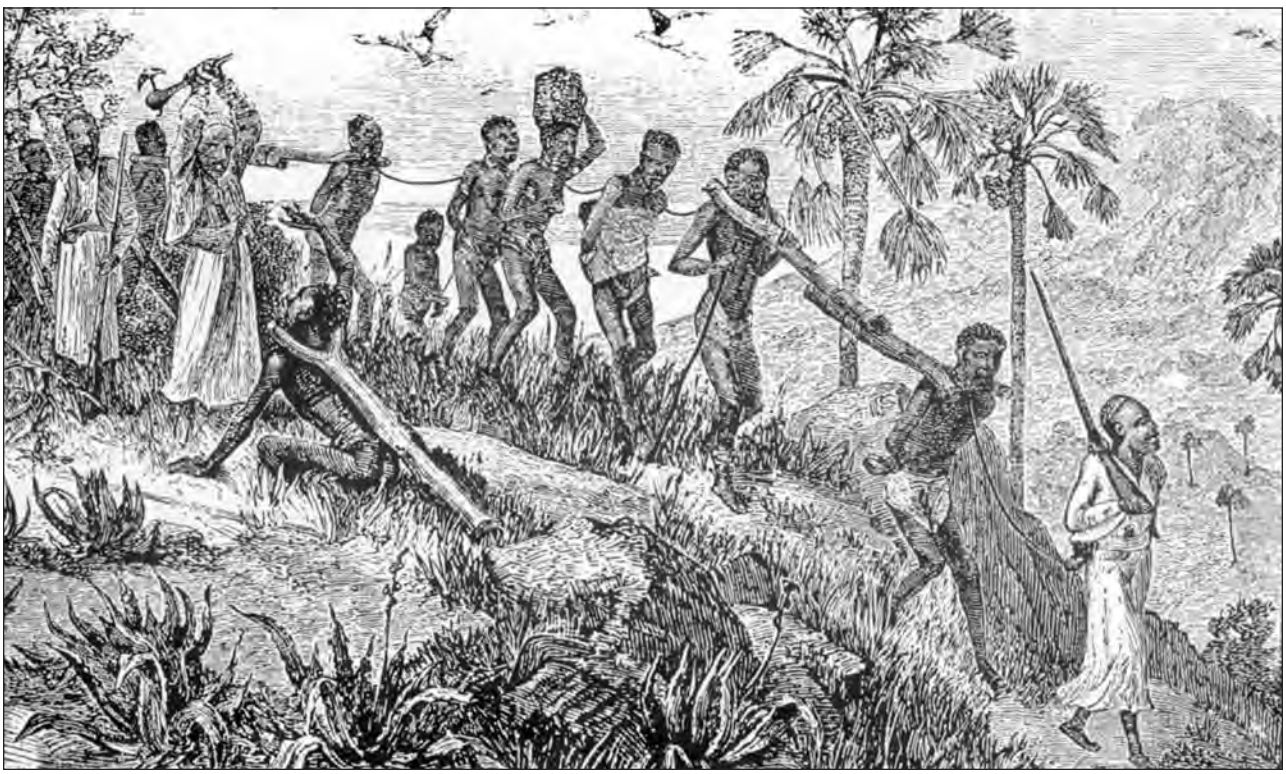
DOCTRINE, STRATEGY, AND TACTICS

The strategies of African militaries grew out of governmental policies and their long-term objectives. The causes of warfare and the development of strategic planning were interrelated. Strategic objectives included control of long-distance trade routes; access to cattle, horses, slaves, and food; creation of defensible borders; and ideological factors such as the establishment of Islamic theocracies. The achievement of strategic goals was based on the assessment of many variables, such as strength of the opposition, conditions at home, available weapons and manpower, perceptions of success, and the collection of intelligence.

Tactics included the conduct of the war, types of assaults or maneuvers, coordination of cavalry and infantry units, and use of weapons in the battle plan. Tactics varied widely from region to region. This was evident in the use of infantry. In late nineteenth century Ethiopia, for example, riflemen formed the core of the infantry. They were assault forces trained to maximize the effectiveness of their firepower, but they were also skilled in the techniques of ambush and skirmish. Infantry in the forest regions, however, relied primarily on the frontal assault supported by flanking movements. The armies of Asante and Dahomey had a standard marching formation: Advancing scouts preceded a main body with left and right wings, followed by a rear guard. Such infantries balanced units of archers, spearmen, swordsmen, and those armed with knives and clubs.

The integration of firearms into African infantries was a slow and uneven process. Firearms predominated only in Ethiopia, the Mandinka and Tukulor Empires, and the forest states of West Africa. Although muskets were available in the forest states after the sixteenth century, their increasing use generally did not revolutionize warfare. Even in the second half of the nineteenth century, when more effective breechloaders were introduced, there was little change in either military organization or tactics. Most states failed to develop a coordinated use of firearms.

Cavalry units dominated the armies in the western, central, and eastern Sudanic regions. Mounted units were composed of both light and heavy cavalry. Heavy cavalry carrying lances and swords were used as shock troops in direct assaults. Light cavalry rode small, fast horses that were used in flanking movements or surprise attacks; these horsemen carried lightweight spears and small javelins. Although most states had infantry units that exceeded cavalry in numbers, foot soldiers generally retained a support-



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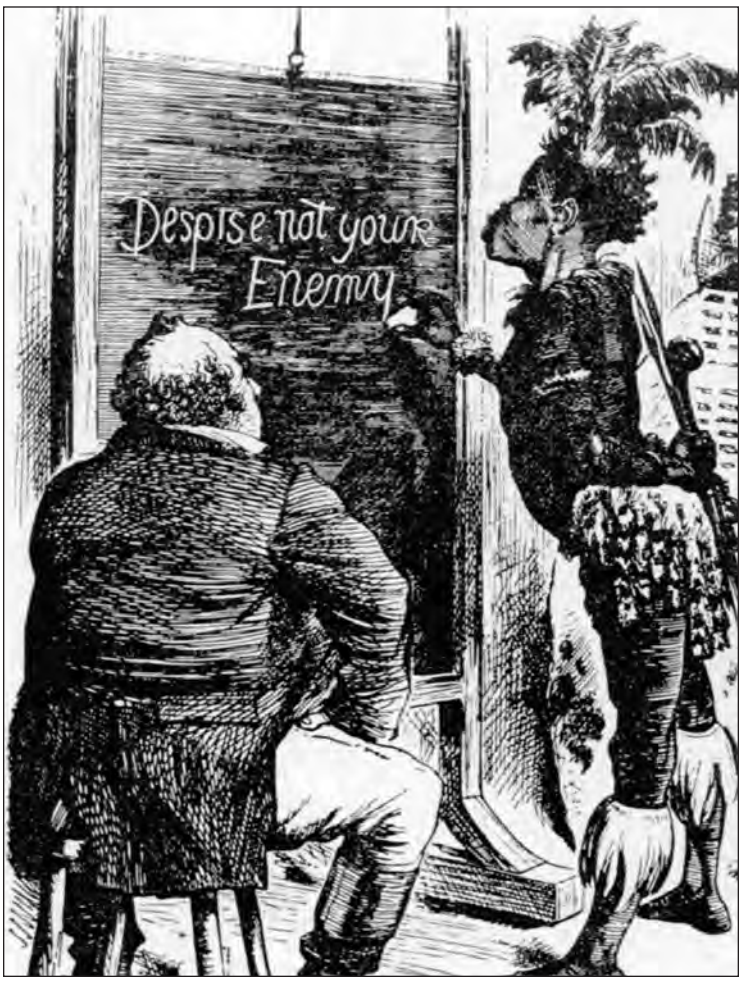
Nineteenth century East African slavers march their captives to the coast. In virtually all African wars of the sixteenth through nineteenth centuries, captives were sold to Europeans as slaves, often in exchange for firearms.

ive role. Heavy cavalry were sometimes accompanied by archers; light cavalry often had footmen to carry extra javelins. Although ʿUthman dan Fodio (1754-1817) eschewed heavy cavalry in favor of light cavalry in his conquest of the Hausa states and establishment of the Sokoto caliphate, his cavalry tactics underwent few changes. Even the introduction of firearms had little impact on the Sudanic ideal of the warrior-horseman.

There were two significant exceptions to the traditional Sudanic cavalry and its associated military tactics. Nineteenth century Tukulor and Mandinka were Islamic states that incorporated large regions and diverse peoples. With the introduction of firearms, these states restructured their militaries. In establishing and expanding the Tukulor state, ʿUmar Tal reduced the cavalry and relied more on infantry. He amassed large numbers of muskets and rifles. By mid-century he had assembled an infantry that coordinated firepower and tactical maneuvers with the shock element of the cavalry charge.

Samory Toure, often called the Bonaparte of the Sudan, was another military innovator. In building the Mandinka Empire he was renowned for both his diplomatic skills and his war tactics. He developed one of the only modernized armies in sub-Saharan Africa. He also reduced the cavalry and substituted large, well-armed, mobile infantry units. He acquired European artillery that supported infantry assaults. His army consisted of central units in the capital, with additional units in the outlying districts. Each district had a force of 5,000 that was organized around 300 highly trained professional soldiers called *sofas*. The standing army consisted of approximately 10 percent of all able-bodied men, but during wartime a conscription system called up 50 percent of the adult males. Samory adapted his strategy and tactics to those of his opponents. Against African enemies he used set-piece battles and direct assaults; against the French, with their artillery and rapid-fire weapons, he relied on guerrilla warfare. His infantry could employ guerrilla tactics because they traveled light, lived off the land, and attacked French supply lines. Each soldier had a firearm, often a repeating rifle, a saber, and a dagger. Samory combined firepower with rapid movement of troops. After fifteen years of resistance, French military power overwhelmed Samory's empire, but his memory remains a lasting legacy in the region.



A political cartoon by John Tenniel warns the British against underestimating the indigenous peoples it was attempting to subjugate in southern Africa.

Another example of outstanding tactical use of infantry was Shaka's Zulu army. Shaka had modified the long spear into a short-handled weapon used for stabbing

rather than throwing. The infantry advanced, sometimes running, in a tight line with shields raised to ward off enemy spears. With their stabbing spears they were able to engage the enemy at close quarters. To take full advantage of this new weapon, they developed an assault formation known as the "cow-horns." This consisted of three equal-sized regiments, with a fourth held in reserve, formed into a crescent shape. The center regiment was used as a shock force; the other units that flanked to the left and right extended forward. The center regiment initiated a furious assault on the opponent, while the "horns" enveloped the enemy from the sides and rear. Once in close quarters, the soldiers used their stabbing spears in hand-to-hand combat. Some Zulu shields had hooks on top, which were used to pull down an enemy's shield and expose part of his body. Zulu soldiers underwent extensive training and maintained a high level of fitness. Their highly mobile regiments sometimes traveled 50 miles in a day. Zulu tactics produced decisive victories and changed warfare throughout southern Africa, as Nguni groups carried the new developments northward into Mozambique, Zambia, Zimbabwe, and Malawi.

African military doctrine was influenced by the interrelationship of religion and warfare. Written documentation, oral tradition, and material culture indicate that virtually all armies engaged in pre- and postbattle ceremonies for purification, protection, and victory. Some kings and military leaders used divination to choose the best time for battle. In some societies the religious pantheon included a god of war who was usually associated with iron, such as Gu in Dahomey or Ogun in Yoruba territory. Invocation of the supernatural was considered essential in warfare.

Contemporary Sources

Primary sources for the study of African military history include African, Arabic, and European writings; African oral tradition; and local histories written by African authors. For the savanna regions of West Africa, there are many sources written in Arabic by African Muslims and North Africans. Two seventeenth century works are essential: *Tarikh al-Fattash* by Mahmud Kati (1468-1593) and *Tarikh as-Sudan* by Abd al-Rahman as-Sadi (1596-1656). Ibn Fartua (fl. 1582), the imam of Mai Idris Alooma, wrote an account of his experience. The "Kano Chronicle" is a native history of the Hausa people. There is a large body of contemporary Arabic documentation on nineteenth century Islamic states written by Fulani scholars. There is a similar collection of writing in Kiswahili on the history of the East African coast, among the most valuable being the "Kilwa Chronicle" and the "History of Pate."

Beginning in the 1500's European merchants made regular visits to the African coasts. Many left descriptions of wars, trade, and diplomacy. There are accounts by William Snelgrave, William Bosman, John Norris, Archibald Dalzel, Jean Barbot, O. Dapper, and many others. A plethora of Portuguese records exist, but these accounts, written before the mid-nineteenth century, deal almost exclusively with African coastal regions and contain little reliable information on events in the interior.

Many late-eighteenth and nineteenth century European sources were written by explorers, merchants, and missionaries. Some of the most important authors include Richard Burton, Hugh Clapperton, Henry Fynn, Heinrich Barth, Henry Stanley, John Duncan, Samuel Baker, René Caillié, J. S. Gallieni, John Speke, Mungo Park, and James Bruce. These works are valuable as sources but must be used carefully, as they contain ethnocentric observations and stereotypes, exaggerations, and misleading information. Nevertheless, they remain important sources for the study of African armies.

There are two other types of African sources. The first, oral tradition, is an integral part of African cultures and a rich source for military history. Given the connection between warfare and royal power, oral tradition must also be evaluated with caution, because it often reflects the

viewpoint of the ruling elite. The second source includes local histories written by African authors. These are collections of oral traditions supplemented by the experiences of the authors and the memories of the local inhabitants. Examples are works by Nigerian authors Samuel Johnson and Jacob Egharevba. Historians should examine works of art, music, song, and dance for further insights into the role of the military. These sources become valuable when they are integrated and corroborated. Only then will one gain an understanding of warfare and society as it is reflected in the "new military history."

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Thomas C. Maroukis and Cassandra Lee Tellier

Iran

Dates: c. 1500-1922

Political Considerations

The names "Iran" and "Persia" are virtually synonymous. Iran is the name by which Iranians have always known their country. The name Persia, derived from the ancient Greek Persis, was used by outsiders until the twentieth century, when Reza Shah Pahlavi (1878-1944), the shah of Iran from 1925 to 1941, insisted that "Iran" should become the international usage.

Before the development of mechanized transport, the Iranian plateau was a singularly forbidding land in which to campaign. Its vast extent and prevailing aridity, its alternating landscape of desert and mountain, its virtual absence of navigable rivers, and its lack of roads and wheeled transport meant that it was best suited to the traditional warfare of pastoral nomadic tribesmen.

From 1500 to 1722 Iran was ruled by the Safavid Dynasty, one of the "gunpowder-empires" of the early modern period of Islamic history. The Safavids united the entire Iranian plateau and, at times, the adjacent regions of southern Iraq, Transcaucasia, and western Afghanistan under the rule of a single monarch—known as a *shah* (king) or *shahanshah* (king of kings)—and imposed a form of Shiism upon most of their subjects. Safavid rule eventually collapsed under assault from Ghilzay Afghans of the Qandahār region, thereby inducing czarist Russia and the Ottoman Empire to seize extensive areas of northern and western Iran.

Territorial integrity was restored by Nādir Shāh Afshari (1688-1747), a tribal leader of great military capacity, who expelled the invaders and launched successful campaigns far beyond the frontier of modern Iran, from Baghdad to Bukhara, and from the Caucasus to Delhi. Nādir Shāh was assassinated by rival tribesmen in 1747, and the Iranian plateau then reverted to tribal particularism and intertribal conflict. The eastern provinces of the former Safavid Empire (Khorāsān, Sistān, Herāt, and Qandahār), now passed into the hands of the Afghan Durrāni Dynasty established by Aḥmad Shāh Durrāni (c. 1722-1773) at the death of Nādir Shāh, while in the west internecine warfare prevailed. By the close of the eighteenth century, however, much of the plateau had been brought under the firm control of the head of the Qājār tribe, Aghā Muḥammād Khān (1742-1797). A cruel eunuch who had been castrated at the age of six by one of Nādir Shāh's nephews, Aghā Muḥammad Khān Qājār proved to be a brilliant and rejuvenating leader of tribal cavalry who was able to establish the frontiers that Iran continues to possess.

Aghā Muḥammad Khān Qājār bequeathed his conquests to a nephew whose descendants, the Qājār Dynasty, ruled Iran until 1925. Under this dynasty, Iran experienced humiliating military defeats at the hands of Russia (1804-1813 and 1826-1828) and Great Britain (1856-1857), a successful war with the Ottoman Empire (1821-1823), numerous internal uprisings, and an unsuccessful expedition against the Yomut Turkomans of the Gurgan region in 1889. The two wars with Russia led to the loss of substantial territory in Transcaucasia beyond the Aras River.

Throughout the nineteenth century, the government of Iran faced intense diplomatic pressure and threats to its national integrity from both Russia and Great Britain and confronted the challenges of Westernization and modernization. In 1906 popular protests against the ineptitude and corruption of the shah's government and its subservience to foreign interests led to the promulgation of a constitution and the establishment of a rather dubious parliamentary regime. However, the Anglo-Russian accord of 1907 divided Iran into spheres of influence between the two great powers, an arrangement that the government of Iran was powerless to prevent. During World

Hulton Archive/Getty Images

Reza Shah Pahlavi, who as a colonel modernized the Iranian army and in 1925 overthrew the Qajar Dynasty that had ruled Iran since the end of the eighteenth century.

War I (1914-1918), despite its official neutrality, Iran found itself invaded by the forces of the belligerents and was later denied a voice at the Paris peacemaking in 1919. With Russia temporarily preoccupied with the Bolshevik Revolution (1917-1921), Great Britain attempted, without success, to impose upon the Iranian government a treaty that would have reduced Iran to a virtual British protectorate. It was against the background of these events that there occurred in 1921 the coup d'état that eventually brought to power the Cossack colonel Reza Khan, who from 1922 vigorously undertook the modernization of the Iranian army. In 1925 Reza Khan swept aside the moribund Qājār Dynasty and proclaimed himself Reza Shah Pahlavi. The Pahlavi Dynasty finally expired in the Islamic Revolution of 1979.

MILITARY ACHIEVEMENTS

The military history of the period from 1500 to 1922 falls into four broadly overlapping phases. First, under the rule of the Safavids (1500-1722) and of Nādir Shāh (r. 1736-1747), Iran was a formidable military power, confronting neighboring Ottomans, Mughals, and Central Asian Uzbeks. Iran relied mainly upon its superb tribal cavalry but increasingly adopted Ottoman and European weaponry and military organization. At first, the Iranians were no match against Ottoman artillery and well-disciplined infantry, the famous janissaries, as shown by their crushing defeat at Çaldiran (1514), but they were quick to learn, and early in the reign of Shah Ṭahmāsp I (1514-1576) the sources refer to the existence of gunners (*tupchiyan*) and musketeers (*tufangchiyan*). However, for most of the sixteenth century, the Safavids continued to rely upon their hardy and mobile cavalry, as in Ṭahmāsp's great victory over the Uzbeks at Jam (1528).

The dynamic ʿAbbās I the Great (1571-1629), who reigned from 1588 to 1629, introduced major innovations. His objectives were to enhance the power of the throne, to break the independence of the turbulent tribal leaders, and to win back the lands lost to

the Ottomans by previous shahs. His reforms, primarily the establishment of regular units personally loyal to and paid by the shah, some of whom were equipped with handguns and field artillery, soon produced the sought-for results. In 1598 Herāt was recaptured from the Uzbeks, and in 1605 the shah won a great personal victory over the Ottomans at Sufiyan, near Tabrīz. During protracted campaigning thereafter, the shah reoccupied Erivan and Nakhshivan, and in 1624 captured Baghdad, from which the Safavids had been expelled in 1534. In 1625, he took the great frontier-fortress of Qandahār from the Mughals, and in 1626 he showed outstanding generalship in foiling a massive Ottoman attempt to reconquer Baghdad. Both Baghdad and Qandahār were lost in 1638, but ʿAbbās I's great-grandson, ʿAbbās II (1633-1666), regained Qandahār in 1648 and beat back three Mughal attempts to retake it. Thereafter, however, inept rulers, flaccid government, and declining revenues led inevitably to the debacle of 1722, when Iran was conquered by Afghan raiders. The spectacular conquests of Nādir Shāh, who devoted himself to reestablishing Iran's former frontiers, made him the terror of neighboring lands. Nādir Shāh raised Iranian military prestige to unprecedented heights achieved at a dreadful cost of lives and revenues.

In the second phase of Iran's military history, from 1747 to 1797, Iran, exhausted by the loss of manpower and resources that was the price paid for Nādir Shāh's glory, seemed to have turned in upon itself. The country was wholly preoccupied with intertribal conflicts, cause and effect of the general economic decline, and paid little attention to developments beyond its frontiers. The forces involved were much smaller than those of the recent past, were probably less well equipped, and maintained themselves by plunder. The genius of Aghā Muḥammad Khān Qājār in large measure reconstituted the Iranian monarchy as it had been under the Safavids.

During the third phase, which spanned the greater part of the nineteenth century, Iran was forced to confront the reality of the overwhelming military superiority of Europe, specifically, of Russia and Great Britain. Threatened by Russia in the northwest, ʿAbbās Mīrzā (1789-1833), the heir-apparent of the second Qājār ruler, Fatḥ ʿAlī Shah (1771-1834), who was also governor of Azerbaijan, became an enthusiastic reformer and variously sought the help of British and French advisers and equipment to defend his exposed province. The British and French presence was dependent upon the exigencies of those countries' relations with Russia, but ʿAbbās Mīrzā also employed up to 88 Russian deserters and any other European mercenaries who came his way. During the First Russo-Iranian War (1804-1813), he possessed a force of 6,000 infantry trained by European officers and known as the Nizam-i Jadid, or the New Army. The infantry's numbers had grown to 8,000 by 1817 and to 12,000 by 1831. In addition, there was a corps of 1,200 gunners trained by European artillery officers and a single cavalry regiment, although where the cavalry were concerned, ʿAbbās Mīrzā retained his faith in the esprit and mobility of traditional tribal levies. To meet the needs of these forces, he established, under European supervision, an arsenal with a cannon foundry and powder mill in Tabrīz and renovated the forts of Tabrīz, Ardabīl, and Khvoy.

Opinions varied considerably regarding the fighting capacity of the Nizam-i Jadid troops, and it was said that ʿAbbās Mīrzā's rival for the throne, Muḥammād ʿAli Mīrzā, governor of Kermānshāh, had greater success against the Russians with his Kurdish tribal levies, armed and deployed as in the time of Aghā Muḥammād Khān. ʿAbbās Mīrzā encountered opposition not only from military conservatives but also from the Shiite clergy, who opposed innovations of all kinds as likely to lead to the introduction of further infidel ways. Enthusiasm for further military reforms diminished after the Second Russo-Iranian War (1825-1828) and confirmed the permanent Russian occupation of the Transcaucasian provinces. The poor showing of Iranian troops during the Anglo-Iranian War (1856-1857), which had been designed to force the Iranian withdrawal from Herāt, only reinforced Iranian disillusion. It was quite apparent to the new ruler, Nāṣīr al-Dīn Shāh (1831-1896), that his country lacked the ability to withstand foreign aggression. Merely employing more foreign advisers, a stream of which made their way to Tehran from Britain, France, Italy, and Austria, was not enough; a much more radical solution was called for.

Although the shah was not unintelligent, he found himself, in this, as in other aspects of the administration, pulled back and forth between reformers and reactionaries.

Nāṣīr al-Dīn Shāh's first prime minister, Mīrzā Taqī Khān Amīr Kabīr (c. 1798-1852), vigorously initiated reforms, which came to nothing when, having provoked powerful enemies, the shah dismissed him in 1851 and later had him executed. In 1857 a ministry of war was created, and the reforming minister planned changes for the army between 1871 and 1881 that his capricious master would not allow him to implement.

The fourth phase, however, emerged after Nāṣīr al-Dīn Shāh's European tour of 1878, during which he developed great enthusiasm for what he saw of the czar's Cossack regiments. As a result, on his return to Tehran, an Iranian Cossack Brigade was formed, with Russian officers, equipment, and drill. The Cossack Brigade possessed a professionalism that no previous unit of the Iranian army had possessed and by the close of the century was the most effective force in the country. Ironically, when a reactionary ruler, Muhammad Ali Shah (1907-1909) used it in an attempt to overthrow the newly granted constitution, it was a rebel army of Bakhtiyari tribesmen who marched on Tehran and saved the constitution. The success of the Cossack Brigade led to the creation of a Swedish-officered gendarmerie in 1910. During World War I, the British, concerned with German agents and recalcitrant tribes in eastern and southern Iran, formed the South Persian Rifles. Service in all these units exposed an ever-increasing number of Iranian officers, noncommissioned officers, and other ranks to European military discipline, drill, weaponry, and tactics. They would constitute the first generation of troops in Reza Shah's new model army.

WEAPONS, UNIFORMS, AND ARMOR

The tribal levies that constituted the bulk of Safavid forces carried the weaponry traditionally associated with fighting men on the Iranian plateau: a compound horn bow with a quiverful of arrows, a long spear that could be used like a lance or thrown like a javelin, a scimitar (*shamshir*), a mace (*piyazi*), and assorted daggers. There was no uniformity of equipment or dress: A tribesman brought to the campaign whatever he happened to possess, supplemented by what could be looted on the battlefield. For the elite, armor consisting of four iron plates covering chest and back and with a hole for the arms on the two sidepieces was an innovation of the Safavid period. It was known as *chahar aina* and worn over chain mail. In addition, vambraces, or armor for the forearms, known as *bazuband*, were worn, and the rider carried a round steel shield. The cone-shaped helmet (*khud*) was topped by a steel spike, with one or more tubes in front to hold a spray of heron or peacock feathers. Usually, chain mail was attached to the sides and back of the helmet to give some additional protection to the neck and shoulders. Iran had a reputation for manufacturing fine steel (*fulad*) and was especially famous for its swordsmiths (*shamshirgar*), with their finely watered and damascened blades. In the seventeenth century, the town of Qom was known for its manufacture of swords, but in the eighteenth century Khorāsān took its place. During the nineteenth century the manufacture of armor and swords died out in Iran, although it had formerly been among the most acclaimed mechanical arts.

Over the course of the Safavid period, an increasing number of soldiers carried harquebuses, carbines, or muskets, known collectively by the name *tufang*. To traditional mounted archers, such weapons seemed cumbersome and ineffective, and as did the Egyptian Mamlūks, Iranian cavalry long regarded firearms as unmannerly. At first, these weapons, along with more traditional arms and armor, were imported from abroad. During the reign of Muhammad Khudabanda (r. 1578-1588), a Russian envoy from Czar Ivan the Terrible (1530-1584) brought to Qazvin, then the Safavid capital, five hundred firearms and one hundred pieces of artillery.

The earliest cannons came from Russia or Western Europe. The Ottomans naturally would not allow artillery bound for Iran to pass through their territory, although the Iranians must occasionally have captured Ottoman field pieces. As early as 1539 Safavid sources mention the office of the *tupchi-bashi*, the of-

ficer in command of the artillery, who would later have overall responsibility for both the gunners and musketeers. Iranians would eventually manufacture their own cannon and handguns, and until 1922 the gunsmith (*tufangsaz*) was a respected and ubiquitous figure in the bazaars of larger towns such as Shīrāz, Kermānshāh, or Mashhad. However, the gunsmith's trade would end with Reza Shah's prohibition on the private possession of firearms.

The military revival under Nādir Shāh seems to have owed nothing to improved weaponry or technological innovation. Nādir Shāh was a superb commander in the field. His victories and the enormous booty he derived from them provided the revenues with which to maintain increasingly larger armies. These were composed of not only Iranians but also Caucasians, Uzbeks, Afghans, and Baluchis. After Nādir Shāh's death in 1747, no further changes occurred for the remainder of the eighteenth century. The revival of Iran under Aghā Muḥammād Khān Qājār, who reigned from 1779 to 1797, was based upon his skillful generalship, his astute balancing of tribal rivalries, and his ability to bring out the best in the fighting qualities of his followers.

ṢAFAVID IRAN IN THE SEVENTEENTH CENTURY

The most significant development during the nineteenth century was the employment of European military advisers, who introduced the Iranian military to European uniforms, drill, discipline, and tactics. These advisers were attached to the forces of not only the shah but also his sons, who were themselves provincial governors and who sought to improve the quality of their provincial levies in anticipation of the inevitable fratricidal struggle for the throne, which would occur at the shah's demise. Thus, Muḥammād ʿAli Mīrzā, governor of Kermānshāh, enlisted French officers to train his Kurdish levies. Such officers, Napoleonic veterans unemployed since Waterloo, were en route for the Punjab to seek service with the Sikhs.

European units generally trained with weapons of European origin, typically redundant muzzle-loaders known as the Brown Bess. European observers commented unfavorably on the condition in which Iranian soldiers maintained their firearms, which were inadequately cleaned and were often allowed to rust. In the early decades of the nineteenth century, most cannons were of British or French origin, but later in the century there were imported Austrian muzzle-loaders, including 7-centimeter mountain guns for mule batteries. By the end of the century, the best artillery was of Russian manufacture. Again, European observers visiting the Tehran arsenal saw artillery pieces deteriorating from neglect, many with gun carriages that had been allowed to rot. Unquestionably, during the quarter-century prior to the 1921 coup, the best-armed unit of the Iranian army was the Cossack Brigade.

MILITARY ORGANIZATION

Throughout the Safavid period and down to the time of Aghā Muḥammād Khān Qājār, there was a minimum of military organization. In wartime, the shah summoned his vassal chieftains, who then, if they were so inclined, came to his summons with their followers, who thereafter continued to serve under their own hereditary leaders, who fought alongside those of the shah, or abandoned him, if self-interest required. For this reason ʿAbbās I the Great was determined to rely as little as possible upon the turbulent and often insubordinate tribal levies, even while recognizing their advantages: speed, mobility, hardiness, and agility. With these benefits in mind, he formed two new units: the *shahisevan*, "those loyal to the shah," recruited from tribesmen willing to sublimate their tribal affinities in fanatic dedication to the service of the shah, and the *gullar* or *ghulams*, slave-soldiers similar to the Mamlūks of earlier Muslim armies in the Middle East. Iranian slave-soldier troops consisted of Christian slaves or prisoners of war, typically Armenians, Circassians, and Georgians. They became converts to Islam and were recruited to join what was, in effect, a kind of Safavid Praetorian Guard, properly known as the *ghulaman-i khassa-yi sharifa*, "Slaves of the Noble Household." These troops were paid for by revenues from the crown-lands and were provided by the government with firearms. Their commander (*gullar-agasi*) enjoyed the prestige of being one of the greatest officers of state. Unfortunately, the later Safavids allowed this standing army to deteriorate to the point that little of it remained by the eighteenth century. The Qājārs had to begin anew, relying mainly upon foreign advisers in an international situation far less favorable than that enjoyed by their Safavid predecessors.

The military weakness of the Qājārs, and the pressure to initiate army reform that built up after 1921, is easily demonstrated by a glance at the Iranian army as it was in 1891. The total strength of 43,889 consisted of 12,427 irregular cavalry amassed through tribal levies; 2,493 European-style semiregular cavalry; 25,000 European-style regular infantry; 1,800 artillery troops, with a nominal 164 guns; 80 camel artillery, useless ceremonial relics of Safavid times; 169 Austrian Corps under the command of Austrian officers; and 2,000 militia.

Only a few of these units were significant. The irregular cavalry were recruited from the tribes that had formerly played so large a part in Iranian military exploits, among which the Kurds, Timuris, and Bakhtiyaris stood out prominently. Tribal units were commanded by tribal chieftains, who held the rank of general (*sartip*) or colonel (*sarhang*). The subordinate officers consisted of a "commander of one hundred" (*yuzbashi*), a "commander of fifty" (*panjbashi*), and a lieutenant (*naib*). On active service, of-

ficers received allowances but no pay. The common soldier (*sarbaz*) and his noncommissioned officers received a graduated scale of pay and rations: for the sarbaz, 6.5 pounds of barley for himself and 13 pounds of straw for his horse per diem. Both officers and men provided their own cavalry mounts. The latter were not more than 14.5 hands high but struck observers as possessing great strength, speed, stamina, and remarkable powers of endurance. Riders were extremely agile and could perform extraordinary feats of marksmanship at full gallop. One English officer, Sir Henry Creswicke Rawlinson (1810-1895), who trained tribal levies in southwestern Iran during the early nineteenth century, described his men as "the very *beau ideal* of military material, the men being athletic, strong, hardy and active." European conventional wisdom, however, held that the native officer corps were of deplorable quality and that Iranian soldiers would perform well only when commanded by European officers. The irregular cavalry were organized into approximately ninety squadrons ofbetween fifty and seven hundred men drawn from all parts of the country, the majority coming from Khorāsān (24 squadrons), Azerbaijan (23), Tehran (6), Gīlān and Māzandarān (5), and Kermānshāh (5).

The semi-irregular cavalry were equipped, drilled, and trained in European style and consisted of three regiments, two cantoned in Tehran and one in Eṣfahān. The two regiments in Tehran formed the Cossack Brigade, with officers and weapons provided by Russia, although both officers and men supplied their own horses. The government issued rifles, swords, saddles, and bridles. The government also provided barracks (*sarbazkhana*), accommodations facing an open square or courtyard, with stabling on the ground-floor, resembling a traditional caravansary. The regiment in Eşfahān was equipped and trained in imitation of Prussian uhlan light cavalry, a whim of the powerful governor Zil as-Sultan, a son of Nāṣīr al-Dīn Shāh. Taken as a whole, the semi-irregular cavalry, and especially the Cossack Brigade, were regarded as the most effective part of the army, thanks to the zeal of their Russian officers.

The regular infantry were conscripted province by province, under the command of the local governor. So grim was the life of the *sarbaz* held to be that recruitment was by virtual impressment, local communities banding together to designate the unfortunate recruit or sometimes paying a sum of money to anyone who would volunteer freely. Service was for life, unless a soldier could raise enough money to buy a discharge from his colonel, and the age range in the regiments ran from adolescent boys to toothless graybeards. However, Christians, Jews, Zoroastrians, and cultivators on crown-lands were exempt from military service. A regiment ideally consisted of 10 companies of 100, both officers and men, making a total of 1,000 men per regiment, but the full complement of men was rarely achieved, and most companies were fixed at around 70. The pay and allowances of the common soldiers were pitiable and were further subject to various perquisites and bribes demanded by the officers. Uniforms, provided by the government, consisted of a tunic of coarse blue serge, trousers of the same material, a brown leather belt, and a black lambskin hat known as a shako, with a brass badge. Outside Tehran, however, most soldiers lacked a full uniform.

DOCTRINE, STRATEGY, AND TACTICS

There is no evidence of strategic thinking on the part of Iranian military leaders during the period from 1500 to 1922. Traditional tactics consisted of the cavalry charge en masse, performed with such great verve and dash that even better-disciplined opponents wavered and retreated. However, if the initial impetus of the massed charge failed to achieve its aim, Iranian cavalry quickly became demoralized and withdrew. At other times they practiced with great effect the ambuscade and the harrying of stragglers and supplies on the line of march. Over the vast expanse of the Iranian landscape, they were skilled at pursuing a "scorched-earth" policy against invading troops operating far from their bases, who were thereby deprived of the food and fodder that was normally obtained by living off the land. Both Ottomans and Russians found themselves hamstrung by such tactics, which were particularly skillfully employed by Aghā Muḥammād Khān Qājār.

During the nineteenth century Iranian officers, es-

pecially those stationed in Azerbaijan, acquired the rudiments of strategic thinking and battlefield tactics from their European military advisers, but for most of the century they received no formal military education. At the beginning of Nāṣīr al-Dīn Shāh's reign, his first reforming prime minister, Mīrzā Taqī Khān Amīr Kabīr, founded a European-type academy, the Dar al-Funun, which included some classes in military instruction designed specifically for young officers. Later in the reign, the shah's favorite son and commander in chief, Naib as-Saltana, established a military academy. However, as late as 1891, the shrewd Lord George Curzon (1859-1925) could write of the officer corps: "Ignorant of military science, destitute of esprit de corps, selected and promoted with no reference to aptitude, they are an incubus under which no military system could do otherwise than languish." At the time Curzon wrote, however, a change was becoming apparent. Iranian officers were benefiting from Russian instruction in the Cossack Brigade and later from the Swedish officers in charge of the gendarmerie. A number would see service with the British-controlled South Persian Rifles during World War I. These would form a nucleus of experienced officers who would become the agents of Reza Khan's post-1922 reforms. It is surely no surprise that the architect of the modern Iranian army should have emerged from the ranks of the Cossack Brigade.

CONTEMPORARY SOURCES

Accounts of warfare under the Safavids and Qājārs are to be found in contemporary Persian-language chronicles. Two excellent examples are Iskandar Beg Munshi's (1560-1633) *Tarikh-i ʿAlamara-yi ʿAbaci* (c. 1571-1629; *The History of Shah ʿAbbās the Great*, 1978) and Hasan-e Fasai's (born c. 1821), *Farsnamah-ī Nasiri* (1895-1896; *History of Persia Under Qājār Rule*, 1972). Safavid military organization is described in an anonymous Safavid administrative manual, *Tadhkirat al-muluk* (c. 1137-1725; *A Manual of Safavid Administration*, 1943). Chapters 21, 23, and 26 of Sir John Malcolm's (1769-1833) two-volume *The History of Persia from the Most Early Period to the Present Time* (1815) provide material on the early Qājār army by an eyewitness. In addition to the official reports of foreign embassies in Tehran, European travelers in nineteenth century Iran frequently wrote down their subjective but insightful impressions of military matters. The most informative is that of Lord George Curzon, *Persia and the Persian Question* (1892). Brigadier-General Sir Percy Sykes (1867-1945), who commanded the South Persian Rifles during World War I, provides a personal account of wartime Iran in chapters 85 through 89 of *A History of Persia* (1915).

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Gavin R. G. Hambly

Japan
Modern
Dates: c. 1600-1930

Political Considerations

In the years from 1600 to 1930, Japan underwent three major shifts in political leadership: The Tokugawa period was followed by the era of the Meiji Restoration, and then, shortly before 1930, the nation saw the triumph of military ultranationalism over constitutional government. The Tokugawa era, or "period of Great Peace," marked a turning point for Japan after centuries of civil war that had divided the archipelago as families struggled against one another for power around landed estates called *shoen*. After the military failures of two "pretend" shoguns (Oda Nobunaga and Toyotomi Hideyoshi), Japan was finally dominated by a powerful political daimyo lord named Tokugawa Ieyasu. The shogun used the alternate attendance system in order to "capture" rival daimyos by forcing each to maintain two residences, one at home and one in the new capital city of Edo (later called Tokyo). He also created an elaborate bureaucratic structure under a "tent" government called the *bakufu*, which helped to make policy and personnel decisions, and supervised the some 260 daimyos who still presided over feudal Japan. Daimyos were divided into inside (*fudai*) and outside (*tozama*), with the former receiving political favors for their loyalty to the government in Edo.

The emperor and the samurai remained two major feudal entities of the Tokugawa peace, but their power waned in the ensuing century as the daimyos jockeyed for influence in the new government, and landed estates required less protection from samurai armies than in previous periods. Challenges to the rule of the shogun were minimal as violence was restricted to small skirmishes in the streets, peasant rebellions, and the enforcement of maritime restrictions and the ban on Christianity imposed in the 1630's and 1640's. The spread of Christianity and the Portuguese Christian missionaries who arrived in Japan with Western and Chinese merchants were seen as threats to the unity and stability of the Tokugawa state. With some very particular exceptions (such as the Dutch), foreigners were banned from the interior parts of the Japanese archipelago, and Japanese Christians were persecuted. These actions, along with famines and other difficulties, later led to a number of rebellions and uprisings, the largest and most famous of which was the Shimabara Rebellion in 1637-1638.

The next major period of change for Japan did not arrive until the mid-nineteenth century, when the appearance of gunboat diplomacy forced the so-called opening of Japan by Western powers, underscoring the weaknesses of the shogunate

Turning Points

1603	Tokugawa Ieyasu becomes shogun, marking the beginning of early modern Japanese history.
1867	The last Tokugawa shogun surrenders power to imperial forces, paving the way for the Meiji Restoration and Japan's reentry into world politics and culture.
1904	Japan attacks the Russian-controlled port of Lüshun, traditionally known as Port Arthur, beginning the Russo-Japanese War, fought between Russia and Japan for control over Korea and Manchuria.
1905	The Japanese navy wins a stunning victory at the Battle of Tsushima, devastating the Russian fleets and forcing Russia to surrender Korea and other territory to Japan.

and leading to its collapse. With the negotiation of treaties, first after the arrival of Commodore Matthew C. Perry's U.S. black ships in 1853, Japan soon began to mimic the Western claim that imperialism was necessary to civilize "savages" by acquainting them with the spiritual and material benefits of modern technology and mechanisms of social control. This premise was actually discussed in Japanese political circles during the 1790's, including in the influential essay "A Secret Plan for Government," by Honda Toshiaki, which laid out Japan's four major imperative needs: to learn the effective use of gunpowder, to develop metallurgy, to increase trade, and to colonize nearby islands and more distant lands.

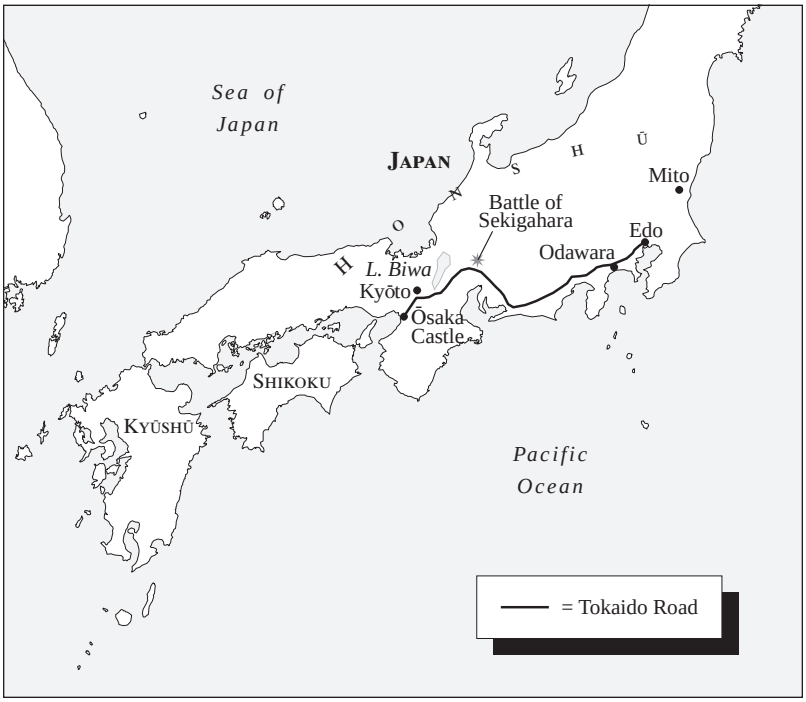
The shogunate's inability to deal with the influence of Westerners, coupled with rising domestic distress, led to the end of the regime, and in 1867, backed by a military coup, the emperor proclaimed the Meiji Restoration. With the return of power to the emperor for the first time in centuries, the young Meiji emperor set in motion rapid industrialization based on the Western model. Importing new military technology, industry, legal norms, and constitutional thought (along with a parliamentary system based on the German model) as well as new ideas in science, forms of dress, and food, the Meiji abolished status distinctions and centralized government.

Library of Congress

The Japanese artist Hiroshige portrayed a U.S. warship in Tokyo Harbor—probably part of Commodore Perry's flotilla.

By constructing a new body politic around the notion of *kokutai*, which translates roughly as "national essence," Japan remade itself into a society focused on achieving the ultimate goal of becoming a major global player on the international scene. Though the actual end of the shogunate and the establishment of the imperial government following a Western model were handled entirely peacefully, through political petitions and the like, the years surrounding these events saw a revolution that was not entirely bloodless. The ensuing Satsuma Rebellion (1877), led by samurai Saigō Takamori, was the final attempt to

JAPAN, C. 1615



drag Japan back to an earlier period of feudal control, but it was quickly crushed.

By the end of the nineteenth century, Japan was transformed from a decentralized, largely agrarian land into a centralized, industrialized nation. The Japanese built trains, adopted Western-style facial hair and modes of dress, and allowed powerful business cartels called *zaibatsus* to control the flow of capital. They also came to understand that national defense would require expansion abroad. The Meiji government undertook two major campaigns in 1895 against the fledgling Qing government of China in the Sino-Japanese War and defeated the Russian fleet—becoming the first Asian country to defeat a Western power in combat—during the Russo-Japanese War (1904-1905). By entangling Japan in world affairs, the government attempted to balance contradictory impulses toward democracy and toward totalitarianism; at the same time, Japan was continually treated as a racially inferior power by most European countries. The results of World War I (1914-1918) saw Japan reap the benefits of its newfound status as an Allied nation, with the acquisition of a colony on the Shandong Peninsula in China and membership in the League of Nations. However, Japan was continually left out of major discussions at the Paris Peace Conference of 1919.

By the 1920's, Japan became embroiled in the global Great Depression as overproduction and currency failures ravaged the world's economies. With threats from Russia and China in Manchuria, ultranationalist sentiments inside the Japanese military and outside the government accused the political parties of weakening Japan in their pursuit of self-interest. With a new emperor, Hirohito, on the throne by the late 1920's, critical voices within Japan appeared to be as dangerous to Japan's economic and national security as threats from abroad.

MILITARY ACHIEVEMENT

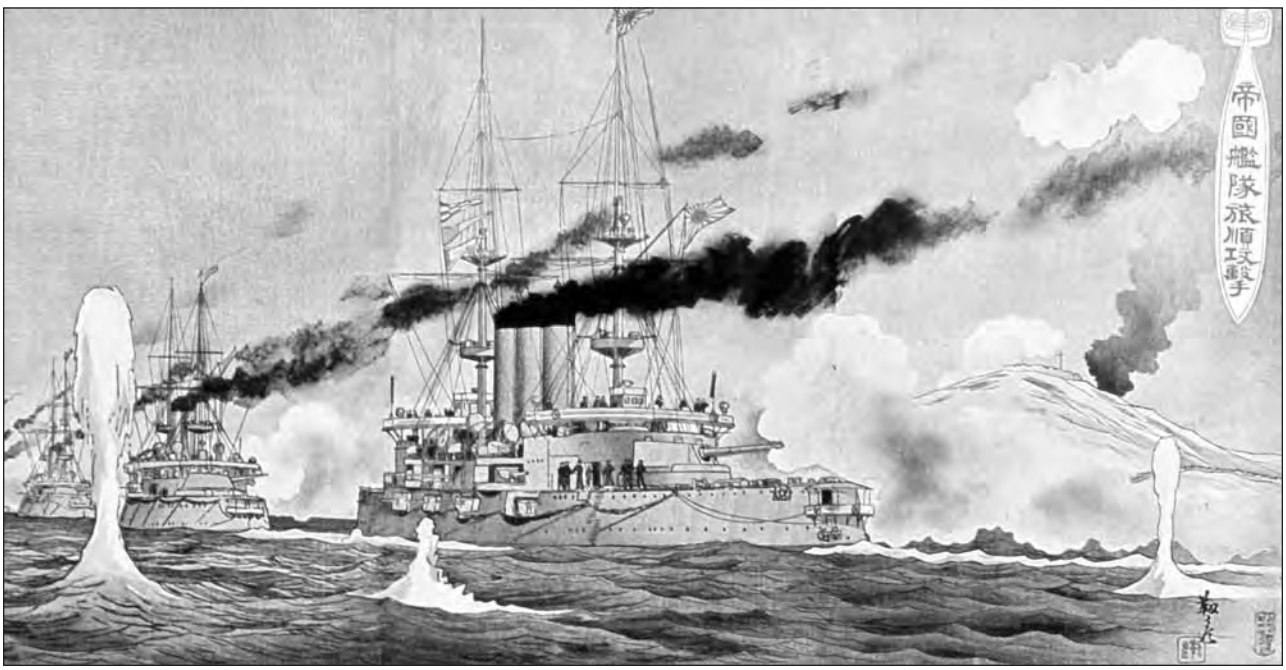
Around 1600, the Japanese were focused first on defeating enemies militarily within their borders; by the nineteenth century, their focus was on challenging international rivals in several theaters in the Pacific Rim. The Tokugawa period was marked at first by a civil war that led to a struggle between members of the daimyo class as they fought to become the first unifier of Japan under the shogunate. After conquering his competitors at the Battle of Osaka Castle in 1615, Tokugawa Ieyasu inaugurated a long period of peace during which few outside invaders or internal struggles plagued the Japanese mainland.

It was really not until the nineteenth century, after the "opening" of Japan by the United States in 1853, that the Japanese began to be engaged in military conquest outside their national borders. After a treaty negotiation with the Chinese in 1871 that granted extraterritoriality, Japan expanded its influence by engaging in a five-month war with neighboring Taiwan

over a dispute in the Ryukyu Islands that led to Japan's attaining control over the complete archipelago. The expanding empire next turned toward neighboring Korea, which was believed to be the "dagger" pointing at the heart of China. Diplomatic missions to Korea finally led to a complete breakdown in Japan's relationship with China in 1894, resulting in the Sino-Japanese War. During the nine months of this conflict, Japanese troops expelled the Chinese army from Korea, defeated the north Chinese navy, captured Port Arthur and the Liaodong Peninsula in south Manchuria, and seized a port on the Shandong Peninsula. The ensuing Treaty of Shimonoseki, signed in April of 1895, gave Japan Taiwan and the Pescadores, Port Arthur and the Liaodong Peninsula, an indemnity, and a promise by China to respect Korea's autonomy.

These military and diplomatic achievements did not last, however, as Russia, backed by other Western powers, forced Japan to cede all of its mainland acquisitions back to Russia. By 1900, Japan had begun the drive toward greater power status by signing an alliance with Britain and going to war against Russia in 1904-1905. Russia's holdings threatened Japanese interests in Korea, and when Russia refused to make concessions, Japan launched a surprise attack on Port Arthur. The Treaty of Portsmouth (1905), negotiated by the United States and President Theodore Roosevelt, gave Japan expanded power after the humiliating defeat of the Russian army and navy, which had sailed halfway around the world to engage the Japanese. Japan envisioned an empire that would bring prestige and power and would be a liberating force for what later ultranationalist Kita Ikki deemed a world of "Asia for Asians."

During World War I, Japan expanded both economically and diplomatically. By protecting sea lanes in the Pacific and mounting an offensive against the German-held Shandong Peninsula, Japan acquired a mandate over German-held islands in the region. Japan tried to impose its will on China through the Twenty-one Demands by the end of 1918, and many concessions were offered to Japan at the Versailles peace conference.



North Wind Picture Archives via AP Images

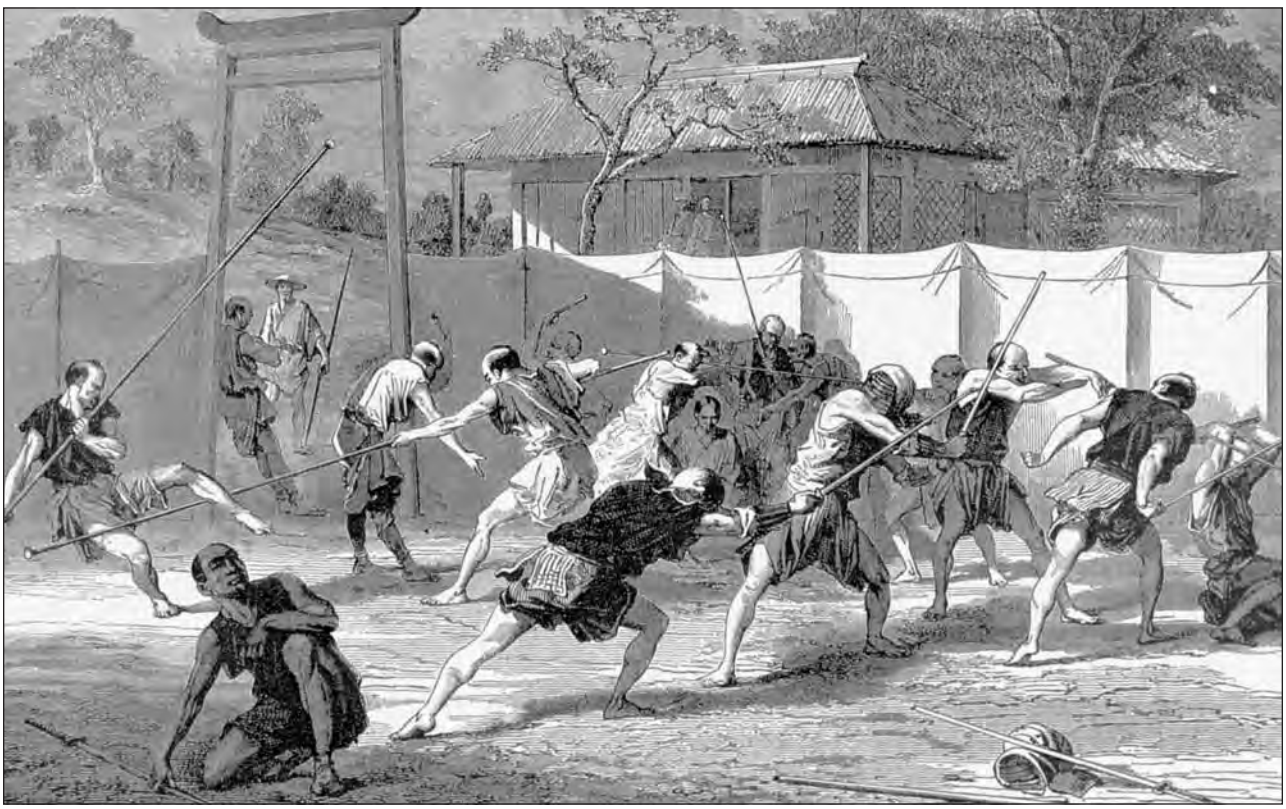
Japanese warships take Port Arthur during the bloodiest and most controversial battle of the Sino-Japanese War of 1894-1895.

Following World War I, Japan spent most of the 1920's expanding its military influence while at the same time playing an active role in the development of the world's economy. By 1930, the Japanese military had begun a full-scale plan to take over all of Manchuria, eventually setting up the Greater East Asia Co-Prosperity Sphere on the eve of World War II.

WEAPONS, UNIFORMS, AND ARMOR

Japanese military dress and weaponry in the pre-1868 period were highly personalized and unique for each of the individuals who served the shogun after 1614. Samurai were the knights of medieval Japan, and even during the Tokugawa period until the Satsuma Rebellion in the late nineteenth century, the samurai enjoyed a special place in Japanese society and military culture. The samurai's armor was strong and elaborate in its ornamentation. Individual iron scales laced together were eventually replaced in the early seventeenth century by solid-plate technology. Dressing a samurai was an intricate ritual built into the code of bushidō; the process involved twenty-two steps. The signature piece of equipment was the ornate helmet, which consisted of an iron mask surrounded by decoration made of wood and papier-mâché. Proud samurai wore helmets of fantastic shapes that included buffalo horns, seashells, and catfish tails. In many cases, samurai armor was passed down from generation to generation.

Japanese weaponry of this period began with the *katana*, or samurai sword, forged to perfection and razor sharp within a resilient body. The katana was mainly a two-handed sword, and a samurai would normally carry a pair into combat, one short and the other long. The samurai also carried a *yumi*, or bow, made from a deciduous wood faced with bamboo,



F. R. Niglutsch

Young samurai rebels in training.

and an extremely lethal spear called a *yari*, which was an excellent weapon to use on horseback for stabbing opponents. As the samurai became less and less useful during the Great Peace, and their services dulled by lack of activity, masterless samurai, called *rōnin*, wandered from town to town looking for opportunity. Eventually, by the time of the Meiji Restoration, the emperor forbade the samurai to wear their weapons, thus altering a time-honored tradition that dated back to medieval Japan.

The era of reorganization under the Meiji brought a host of major changes to Japanese military tactics along with changes in armor and weaponry. With the adoption of the European style of raising citizen armies through conscription, traditional armor became obsolete. Adopting rifled muskets, cannon, and other forms of technology such as the machine gun, Japan set itself on the path toward military dominance in the Pacific. A new navy made up of steel ships purchased from Britain also altered the course of Japan's ability to dominate the region by allowing the nation to deploy troops with superior force.

After 1868, Japanese troops began wearing navy-blue uniforms similar to those worn by the French army and American troops during the U.S. Civil War era. This changed to a lighter shade of green after 1911, and the army added a summer khaki uniform based on the British style as well. Because Japanese army and navy officers were not issued uniforms by their branches of the service until the 1930's, commanding officers wore a wide variety of interpretations of military dress. High-ranking officials often wore sashes, called *senninbari*, that were fire red in color; these were believed to bring good luck and courage and to make the wearers immune to bullets. The Japanese military continued to incorporate elements of traditional warrior dress from the Tokugawa era until well after 1930.

Military Organization

The organization of Japanese armies from 1600 to 1930 evolved from an elite fighting corps of samurai armies commanded by individual daimyos to a modern imperial army after 1868 based on the European style of warfare. The size of a daimyo's army was determined by the assessed wealth of the daimyo's rice fields; thus the largest property owners could muster the largest armies. Troops were known as samurai—those who serve—a reflection of the hierarchical system of obligation, at the apex of which was the shogun. The *ashigaru* were low-level infantrymen drawn from the samurai ranks. Traditionally, the samurai were the only troops mounted on horseback. After the last great battle at Osaka Castle in 1615, samurai as a military class were given land and titles under Tokugawa rule.

The feudal system of retainers and landowners lasted until the Meiji Restoration of 1868, when the military was reorganized into the Japanese Imperial Army. Copying the Western style of military organization based on the German model of promotion through the ranks, the Japanese system was directly related to the political reorganization of the government. Army and general staffs reported directly to the emperor Meiji himself, and the military had virtually no oversight by the Japanese parliament, known as the Diet. The emperor surrounded himself with a small group of military advisers and had veto power over military spending. This system, based on the Prussian system designed after German unification in 1871, allowed an elite class of military advisers to expand their power throughout Japan's constitutional monarchy. Huge amounts of money were spent on military organization both before and after the Sino-Japanese War of 1894-1895, much of the funding going to the foremost general of the period, Yamagata Aritomo. Yamagata cast a long shadow over the Japanese military during the late nineteenth and early twentieth centuries. Along the way, Japan produced an efficient military schooling system, a well-organized active and reserve force, a professional officer corps that thought in terms of regional threat, and well-trained soldiers armed with the most advanced weapons of the day.

Doctrine, Strategy, and Tactics

In the period from 1600 to 1930, Japanese military strategy can be divided into two major eras. The first,

from 1600 to 1868, mainly centered on the samurai warrior class, the members of which were controlled by the daimyos, or local territorial lords. These armies used cavalry tactics and close formations on horseback led by the samurai; daimyos led these divisions. Dismounted cavalry would be used in siege situations, along with ashigaru (foot soldiers). Castle towns provided defense to local townspeople and to daimyos' families; thus, during the struggle to inaugurate what became known as the Tokugawa era, Tokugawa Ieyasu needed to overrun Osaka Castle using artillery followed by a main assault using ground troops. Practicing ancient bushidō discipline and tactical approaches to combat, samurai armies after the Battle of Osaka Castle concentrated mainly on land development as their feudal responsibilities centered primarily on peace.

From 1868 to 1930, the Japanese military moved in a new direction in its uses of strategy and tactics. After the Meiji Restoration, Japanese modernizers traveled the globe and brought back to Japan the latest in military weapons and doctrine. The Choshu Five, a small coterie of Japanese, laid the groundwork for what has been called "technological plagiarism on a truly heroic scale." The Japanese government brought both French and German military advisers to Japan to set up military training posts and academies for the development of an officer corps. With the development and implementation of the Japanese Imperial Army, which served the newly restored emperor, Japan abolished all territorial land rights and installed mandatory military service in order to build a citizen army on the nineteenth century model. Using the German model of infantry tactics, the Japanese army grew quickly in both skill and maneuverability as it adopted new weapons such as the repeating rifle.

Library of Congress

A woodcut depicting a rōnin (masterless samurai).

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All historical understanding of the Japanese samurai should begin with the seventeenth century text *Hagakure* (*Hagakure: The Book of the Samurai*, 1979). This history, written by a samurai who converted to Buddhism, chronicles the ethical path that all warriors must follow. The story of the 1615 Battle of Osaka Castle was reported by the first Japanese newspaper shortly after the battle, which also printed an image depicting the burning of the castle and the victory of Tokugawa Ieyasu. Probably the most significant document in regard to the Japanese military from the pre-Meiji era is political writer Honda Toshiaki's 1798 work, "A Secret Plan for Government," in which Honda lays out a program aimed at Japan's fulfilling four major needs: to learn the effective use of gunpowder, to develop metallurgy, to increase trade, and to colonize

nearby islands and more distant lands. This program set the stage for Japan to embrace Western-style imperialism after 1868.

No understanding of the impact of the Meiji era would be complete without a reading from either Itō Hirobumi or Fukuzawa Yukichi. The former's influence on the Meiji Constitution (1889) is evident, and reading that document provides a glimpse into the source of the Japanese military's power. Fukuzawa urged Japan to embrace Westernization and to take a hard-line approach to foreign affairs. His work led to the publishing of an 1885 editorial titled "Escape from Asia," which became an anthem for the Japanese "national essence" after 1900. Finally, Lieutenant Tadayoshi Sakurai, a low-grade officer, wrote a fascinating account of a military engagement during the Russo-Japanese War titled "Attack upon Port Arthur, 1905"; this work gives the reader some understanding of the honor culture in the Japanese military during the imperial era.

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J. Nathan Campbell

China
The Qing Empire
Dates: 1644-1911

Political Considerations

The adoption of an isolationist policy by the Ming Dynasty (1368-1644) began a period of decline that ended in the downfall of the regime. This decline became evident by the beginning of the sixteenth century and was accelerated by the corruption of the bureaucratic infrastructure that destroyed the effectiveness of the central government. China's most significant domestic problem was the collapse of the empire's vast public works system. Widespread corruption led to misappropriation of funds meant for the construction and repair of the dikes and irrigation systems upon which China's agricultural life depended. This shortfall led to starvation and open rebellion and invasion by the Manchus from Mongolia. The Manchus captured Beijing in 1644, and by 1647 they had brought the rest of the nation under their control.

The new rulers of China established the Qing (Ch'ing) Dynasty (1644-1911), which would be the last dynasty in China's history. The new leadership retained much of the Ming's political structure, but it took a more activist role in the day-to-day operation of the government, placing Manchu officials in the most important positions. The Qing continued to use the Confucian examination system as the educational foundation of their governmental system. Despite the fact that the Qing maintained much of the traditional culture, many Chinese continued to consider them inferior and unfit to rule.

The early years of the Qing Dynasty were marked by a concerted effort to end the poverty of the rural population. The government passed reforms that lowered both the taxes and labor requirements of the peasants. The dynasty also allocated a considerable amount of money to the maintenance of the agricultural infrastructure. Regulations were also enacted to reduce the ability of the aristocracy to accumulate large amounts of agricultural land. These laws were the first modern attempt in China to enact meaningful land reform.

Most of these programs, however, were unsuccessful, and China's agricultural elite used the widespread hatred of the Manchus to reduce the authority of the Qing government. This allowed the aristocracy to violate new regulations and continue to amass large landholdings. The gulf between the rich and rural poor grew to dangerous proportions.

China's commercial sector also began to expand at an unprecedented rate. Much of this expansion was fueled by the new wealth of Western Europe and the silver from its mines in the Western Hemisphere. The Manchu government reacted to this new international economic reality by lifting the travel restrictions on Chinese merchants. This new freedom allowed the evolution of an extensive trade network that had far-reaching effects on Chinese society. The most important social impact of this trade was the creation of a powerful new class of merchants that controlled the majority of China's international commerce. This new class used its wealth and power to challenge Manchu authority, especially in southern China.

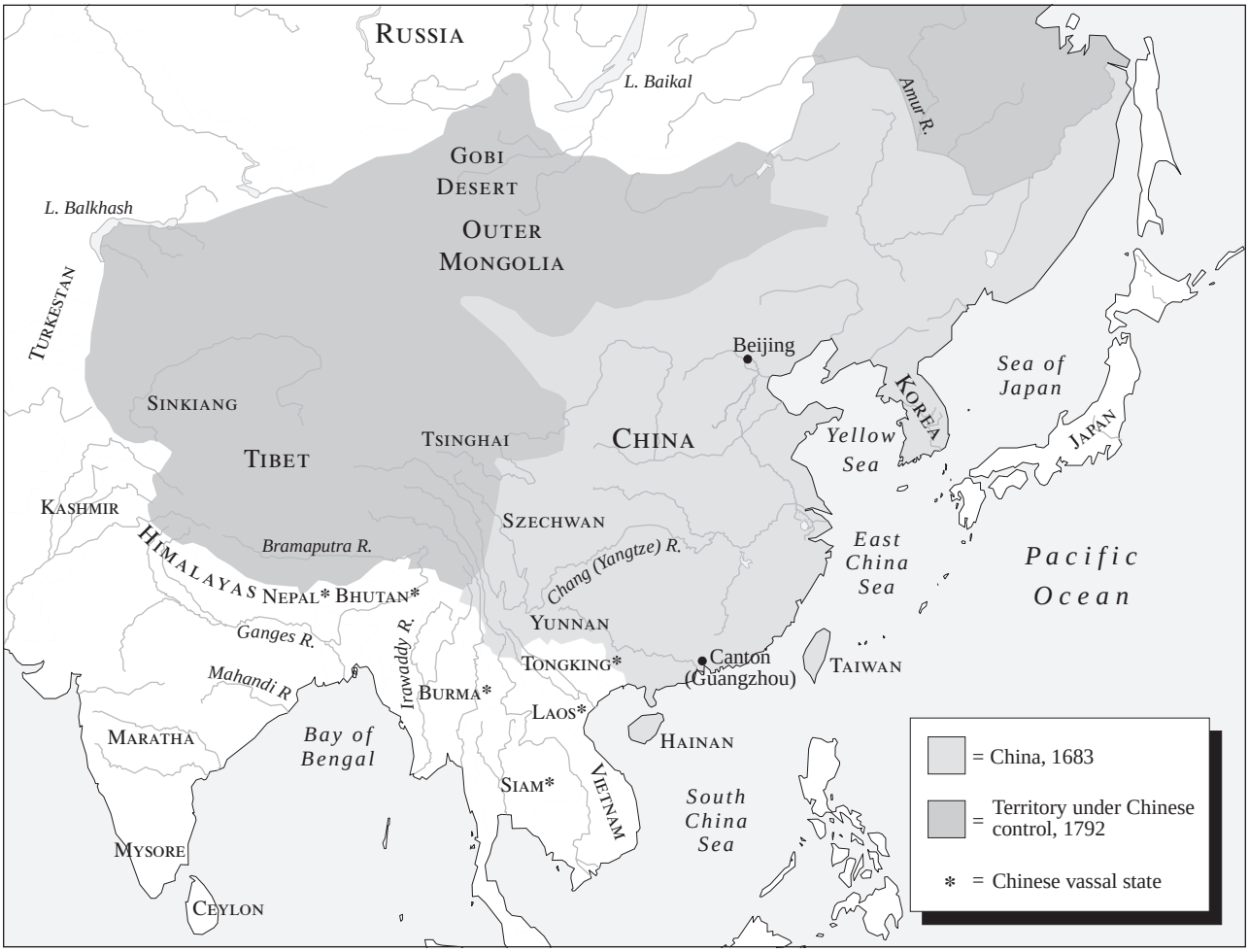
By the 1780's the Qing Dynasty was beginning to show signs of serious decline. The governmental bureaucracy was no longer the domain of the best and the brightest of Chinese society. The classical civil service examination system had been corrupted, and both cheating and favoritism had become commonplace. Wealthy landed aristocrats and merchants used their power to purchase influence within the government bureaucracy. Corrupt officials redirected money allocated for civil engineering projects into their own

China Under the Qing Dynasty, c. 1697

accounts. China's crumbling infrastructure set into motion a series of disasters that would greatly undermine the political and social stability of the nation. Most important, China now lacked the ability to feed its increasing population, and the empire was racked by peasant uprisings.

The nineteenth century was a political, social, and economic disaster for the Qing Dynasty. China was militarily humiliated by foreign powers, both European and Asian. Great Britain, in the Opium Wars (1839-1842), seized control of Hong Kong, and Japan, in the Sino-Japanese War (1894-1895), forced China to cede control of Korea. At the conclusion of each conflict, China was forced to sign a series of

CHINESE EXPANSION IN THE EIGHTEENTH CENTURY



agreements that stripped the country of its national dignity.

In 1845 the British government forced China to sign a treaty that allowed the British to dictate economic policy and at the same time gave British nationals the power to operate free from the constraints of the Chinese legal system. This unrestricted power also enabled Christian missionaries to intensify their program to bring the Chinese population into the Christian sphere of influence. These policies undermined traditional Chinese culture and set the stage for China's most devastating nineteenth century civil conflict, the Taiping Rebellion (1850-1864).

The Taiping Rebellion lasted for more than a decade and cost twenty million lives. An attempt to reform the social injustices inherent in the traditional Chinese social and political structure, it was motivated by the overwhelming feelings of disgrace and humiliation that had resulted from the Chinese defeat in the Opium Wars. A growing segment of Chinese society believed that history was passing China by, and if significant reforms were not made, the nation would be at the mercy of the growing power of the West. The social reforms, especially those concerning land redistribution and the rights of women, reflected the belief that the real power of the West rested in its mobile and egalitarian social structure.

The provincial gentry attempted a series of re-

forms to counter the incursion of Western influence. They sought to use the technology of the European powers to check imperial expansion. They wanted to modernize both the armed forces and China's infrastructure. This was done not to bring Chinese society into the modern world, but as a last-ditch attempt to preserve the traditional order. As these leaders became more powerful, the Manchus lost political control of the provinces.

The Qing Dynasty resisted all attempts at reform. The imperial government, allied with the traditional Confucian bureaucracy, worked steadfastly to preserve the old order. In the final years of the nineteenth century, the empress dowager Cixi (Tz'u-hsi; 1835-1908) attacked all attempts at reform, and her support of the Boxer Rebellion in 1900 would serve as a catalyst for the forces that opposed the dynasty.

As China entered the twentieth century, opposition to the Qing government permeated all segments of Chinese society. Alliances between the powerful merchant class and certain members of the scholar gentry set the stage for the overthrow of the Manchus. These two influential sectors of Chinese society envisioned a new China based upon the republican ideals of the West. In 1911 Sun Yat-sen (pinyin, Sun Yixian; 1866-1925) initiated a revolution that led to the downfall of the Qing Dynasty, and in 1912 the Chinese republic was established.

Military Achievement

The last century of the Qing Dynasty was devoid of any significant military achievement and was witness to the collapse of China's defense establishment. This once-mighty nation was defeated by the armies of both Europe and Japan, which by the middle of the century had surpassed China's military in both tactical and technological skill. The military disasters suffered during this century not only threatened to make China into a colonial subject, but they also were at the heart of two bloody and disastrous civil uprisings.

The Opium Wars were the first of these great military failures and clearly exposed both the diplomatic and military weaknesses of China. By the beginning of the nineteenth century the British had created a very profitable system of international trade in English and South Asian textiles and Chinese tea. By the 1820's tea had become the most valued product in England and was consumed in large quantities throughout the British Empire. This demand resulted in a significant trade imbalance for the British, who attempted to correct the problem by increasing the opium trade with China. Initially, the Chinese government accepted the increase and even shared in the profits. Eventually, however, a number of prominent intellectuals began to speak out against the impact this narcotic was having on Chinese society. The most influential opponent of this trade was Lin Zexu (Lin Tse-hsu; 1785-1850), who held a powerful position within the Qing bureaucracy. When the British refused to stop dumping opium on the Chinese market, Lin Zexu ordered the European trading areas blockaded and had government officials destroy the warehouses that held the dangerous drug. The British military response initiated the Opium Wars.

The major problem facing the British was how to invade and defeat China without becoming bogged down in an extensive and potentially costly land war. The English military relied on their superior naval technology and built a series a small, highly maneuverable steamboats in their shipyards in South Asia. They armed the vessels with extremely accurate rotating cannons and transported them to the coast of China. These gunboats entered China's major river systems and engaged the Chinese navy at every opportunity. The old wooden ships of the Qing fleet were no match for these state-of-the-art vessels, and the British had an easy time gaining control of these inland waterways. This left China's great inland fortifications defenseless, and the Manchu government was forced to accept a British peace agreement.

As a result of its defeat in the Opium Wars, China was forced to sign the humiliating Treaty of Nanjing (1842), the first in a series of diplomatic agreements known as the "unequal treaties," which attacked China's basic sovereign rights. This devastating military defeat would have an important political, social, and cultural impact on the Manchu Dynasty.

Three decades before the onset of hostilities with Britain, most of Chinese society had already been in-

troduced to the basic tenets of Western civilization. Christian missionaries had been extremely successful in converting a substantial number of Chinese to Christianity. Following the disastrous events of the Opium Wars, a large segment of Chinese society began to question the validity of many of its traditional beliefs. Many intellectuals believed it was time to set aside the Confucian worldview in favor of the Western model, which emphasized a blending of Christianity and the scientific method.

In conjunction with this cultural malaise, China's population was suffering from a series of domestic problems resulting from the corruption of the Qing bureaucracy. Rural China was in a state of complete collapse. There were widespread public health problems, and the government was no longer able to provide the services necessary to carry out the day-to-day operation of an orderly society. Revolutionary groups began to appear, claiming to have the answers to this social chaos.

This was the political climate that set in motion the events that would give rise to the Taiping Rebellion. This massive civil uprising was the most devastating event in nineteenth century world history. Between 1850 and 1865 twenty million Chinese would become casualties of the disease, famine, and destruction caused by this civil war.

F. R. Niglutsch

British troops taking formal possession of Hong Kong at the conclusion of the First Opium War (1839-1842).

The Bai Shangdi Hui (Pai Shang-ti Hui), or Society of Worshipers, was one of many secret, revolutionary organizations that grew out of the social and political discontent arising from the failure of the Qing Dynasty, and it played an important role in the rebellion. The majority of the society's members were rural poor who had lost confidence in the Manchu Dynasty. The central figure in the Taiping Rebellion was an emotionally unstable educator named Hong Xiuquan (Hung Hsiuch'üan; 1814-1864) who had suffered a nervous breakdown after failing to pass the required civil service examinations for a teaching position. During a particularly difficult emotional period he came to believe that he had been transported to Heaven, where he was informed that he was the second son of God and the younger brother of Jesus Christ. He believed that he was involved in defeating an uprising against God by a coalition of evil spirits, and that he had been directed by his heavenly father to return to earth and restore peace, justice, and harmony to his homeland by deposing the Qing Dynasty, which had lost its "mandate of Heaven."

The Taiping Rebellion was based upon the fundamental Christian belief in the

F. R. Niglutsch

Rebels gather during the Taiping uprising (1850-1864).

universal relationship and basic equality of all humankind in the eyes of God. The goal of the uprising was to create a society based upon social and economic equality. This new Western ideology challenged the traditional foundation of Chinese civilization, which was structured upon the Confucian model of the unchanging relationship between superior and subordinate. The rebellion's program of economic equality based upon the complete redistribution of land threatened China's landed aristocracy.

The Qing Dynasty was saved by a coalition of Chinese and international forces that eventually isolated and annihilated the rebel forces. Once again, however, the Chinese body politic was deeply frightened by these events, and the power and prestige of the Manchu Dynasty was degraded.

As the nineteenth century neared its conclusion, China faced a new threat from a traditional Asian competitor, Japan. These rivals had followed different courses in the nineteenth century. While China under the Qing Dynasty steadfastly fought to maintain its traditional structure and worldview, Japan openly and aggressively embraced Western science, technology, and educational models. After the arrival of Commander Matthew C. Perry (1794-1858), the Japanese realized that their future would be threatened if they ignored the technological superiority of the West. Unlike the Confucian traditionalists that fought to save the Qing Dynasty and its outdated and corrupt structure, Japanese intellectuals and political leaders undermined the feudal Tokugawa regime (1603-1867) and restored the emperor to a position of power. This period is known as the Meiji Restoration (1866-1868), and was a major turning point in the history of East Asia. Rather than limiting Japan's exposure to Western ideas, the new Japanese

government sent the country's best and brightest to the most prestigious Western institutions of higher learning. Japan's goal was to learn as much as possible about these new scientific advancements so it would be able to prevent the West from making Japan into another China.

By the 1870's Japan was well into the process of industrialization, and by 1890 it had developed a new, highly technological and very powerful military force. Both the army and navy had utilized Western technology to increase their military effectiveness, and Japan could now declare itself a true international power. Japan's new political and military leadership were cognizant of the extent of European imperialism in Asia, and began to exercise its right to enter into this new international competition. Japan's new aggressive posture was supported by a highly developed sense of cultural superiority and a unique racial bias that supported the Japanese belief in the nation's right to dominate Asia.

The First Sino-Japanese War centered on the question of which country would control the Korean Peninsula. Because China had dominated the area for centuries, the Qing government believed that Korea remained within the Chinese sphere of influence. The Japanese challenged this perception in 1876 when they sent one of their new naval squadrons to forcibly open the peninsula to Japanese economic interests. All-out war was avoided when Japan and China signed the Treaty of Kanghwa (1876), which gave Japan trading privileges at two of Korea's ports. This was only a temporary solution, however; Japan fully expected eventually to dominate the area.

The Japanese military establishment continued to push for a military solution to the Korean question, and it was finally presented with an opportunity when the peninsula was the site of an anti-Japanese uprising in July, 1894. Units of Japan's new modernized army put down the rebellion, captured the Korean monarch, and forced him to remove all Chinese nationals from the country. Within two days, the Japanese navy had engaged the Chinese fleet stationed in the area and destroyed the *Kowshing*, a British steamer that was carrying Chinese reinforcements. Relations between the two nations continued to deteriorate, and war was declared on August 1, 1894.

The Chinese armed forces were decisively defeated on all fronts by the Japanese military. Chinese supply lines to their armies on the peninsula were severed when the Japanese navy destroyed the Chinese fleet in the Battle of Yalu River (1894). The bloodiest and most controversial battle was for control of Port Arthur (1894) on the Liaotung Peninsula in the Yellow Sea. Port Arthur's massive fortress was believed to be impenetrable. A Chinese army of 20,000 occupied Port Arthur, and during the campaign they enraged the Japanese by defiling the bodies of dead Japanese soldiers. The modernized forces of the Japanese army, using the latest assault tactics, breached the fortifications and destroyed the defending force. Emboldened by their overwhelming success, the Japanese military moved into Shantung Province and captured the important city of Weihaiwei (1895). Faced with total military collapse, China sued for peace and turned over a large section of Manchuria, along with Formosa (Taiwan) and the Pescadores Islands (P'eng-hu), to Japan. The Japanese victory in the Sino-Japanese War elevated Japan to a position of prominence in East Asia.

As the twentieth century began, China had lost the respect of most of the international community. In the span of five decades it had suffered two major military setbacks and had been torn apart by civil war. The United States, Japan, and the major nations of Western Europe had carved China into economic "spheres of influence," which allowed each nation to dominate the political and economic events of that region.

The systematic application of Western technology in China undermined an already weak and corrupt economic system. The construction of a modern infrastructure based upon rail transportation disrupted the lives of thousands of people. Railroads were both inexpensive and efficient, and drew business away from China's traditional transportation network. The most devastating example was the decline of the Grand Canal, the waterway that had been the backbone of China's domestic trade, linking the bureaucratic north with the agricultural south. Hundreds of families that had moved goods on the canal for generations were now among the growing numbers of unemployed, who crowded into China's ur-

ban areas. The decline in trade also affected the cities that had grown up along the route of the canal. Similar circumstances could be found in the rural provinces that depended upon cash crops for their economic success. Inexpensive high-quality cotton yarn produced in England's textile factories caused the collapse of the yarn industry in China.

China's traditional culture, based upon Confucian and Daoist principles, was also under attack. Christian missionaries were successful in converting thousands of Chinese. At the outbreak of the Boxer Rebellion in 1900, there were 3,000 Christian missionaries of various denominations operating throughout China. These missionaries tried to reform Chinese society based upon the social and religious principles of Christianity, focusing mainly upon human rights and concentrating their efforts toward increasing the status of women and children. These attempted reforms clashed with the traditional values of Confucian society. The xenophobic Qings viewed the Christian missionaries as a substantial threat to the cultural heritage of China.

By the end of the nineteenth century, a group of conservative aristocrats had become a very powerful force in the Manchu government, with the primary goal of eradicating Western influence in China. These conservatives developed a plan of action that would take advantage of the large number of peasants and urban laborers who had lost their jobs to Western industrialization. A secret revolutionary organization known as the Yihequan (I-ho ch'üan), or Fists of Righteous Harmony, organized these unemployed men into an armed force and unleashed their anger upon the unsuspecting Westerners. The Boxers, as they would become known, linked China's overall decline to both Western economic interests

F. R. Niglutsch

Japanese forces enter China after crossing the Yalu River (1894).

and Christianity. Because most of the missionary stations were located in isolated rural areas, the Christian clergy were especially easy targets. The rebels took advantage of this situation and carried out a series of vicious attacks that included rape and mutilation.

The Western diplomatic community responded by creating a multinational strike force of more than 9,000 men to put down the uprising. The two most important engagements were at the cities of Tientsin (1900) and Beijing (1900), with especially brutal fighting at Tientsin. Most interesting to the historian of East Asian military history is the fact that the Japanese army played a crucial role in both battles. The success of the Japanese armed forces instilled considerable confidence within the military leadership and would be a significant factor in Japan's decision to engage Russia four years later. The Boxer Rebellion had disastrous effects on the Qing Dynasty. The victorious allies forced China to dismantle the majority of its armed forces and also fined it the equivalent of 333 million dollars.

Hulton Archive/Getty Images

The Ninth U.S. Infantry Gatling Gun Detachment in Beijing, protecting U.S. interests in China during the Boxer Rebellion (1900).

WEAPONS, UNIFORMS, AND ARMOR

The history of weaponry during the Qing Dynasty reflects the cultural and intellectual conflicts found throughout Chinese society during this time period. Initially the Manchu armed forces modeled themselves after those of the Ming Dynasty, using the traditional weapons of the infantry and cavalry, including the sword, lance, and crossbow. After its humiliating defeat by the British in the Opium Wars, the Qing Dynasty sought to adopt the weaponry of the modern industrial nations, including not only the latest handguns and rifles but also new steam-powered ships and gunboats. A significant debate occurred within Chinese intellectual circles concerning the future of China's armed forces. This new military reality was widely discussed among an emerging class of intellectuals, who focused on the development of a new strategic doctrine. The failure of the Manchu government to employ these new theories would ultimately lead to the destruction of the Qing Dynasty.

MILITARY ORGANIZATION

The organization of China's military went through two important changes during the nineteenth century. After the Opium Wars, China's military leaders blamed the poor performance of the armed forces on three major problems: poor training, lack of morale, and an absence of unit cohesion. These deficiencies would be corrected by the implementation of a model that would create a well-trained and highly motivated mili-

tary fighting force. These reforms began with the officer corps, which would now be allowed to choose subordinates and create units that were based upon close working relationships between officers and soldiers. In the future, when recruits joined a unit, they would be obligated to obey only the orders of their commanding officer. The theory behind this military paradigm was that the average fighting man would perform much better in the heat of battle if he had absolute confidence in his superiors. These reforms were the foundation of China's military organization until its humiliation in the First Sino-Japanese War.

In 1895, after the First Sino-Japanese War, the Chinese military initiated sweeping changes in the organizational structure of its armed forces. These changes were based upon the regulations used by the armies of the industrial nations and were the result of the latest research conducted in the most prestigious military academies in the world. The foundation of this new organizational structure was the creation of a large permanent professional army. This new force would consist of two divisions, each having two infantry brigades and one cavalry and artillery unit. The enlisted personnel would serve four years of full-time duty and would then be placed on First Reserve unit duty. As First Reserves, they would be classified as civilians but would be required to report for training one month per year. During this time enlisted personnel would receive 50 percent of their regular army pay. At the end of three years, the soldiers would then be transferred to Second Reserve units, where they would serve for another four years, after which they would be released from military service. The theory behind this force structure was that China would always have a large supply of trained military personnel to draw upon in a time of crisis.

Doctrine, Strategy, and Tactics

The most dynamic area of Chinese military policy during this time period dealt with the development of philosophy and doctrine. During the nineteenth century, many of China's best intellectuals focused upon the creation of a sound philosophical military model that would provide China with the organization it so desperately needed.

The first significant work in this area was carried out in the years following the Opium Wars by the Qing historian and geographer Wei Yuan (Wei Yüan; 1794-1854), who published a book on the planning of coastal defenses, in which he made two important observations about the future of Chinese security. First and foremost was that the Qing government needed to accept that European ships and guns were superior to those of China. Wei Yuan suggested that the emperor should allocate funding for both the purchase of these weapons and the creation of a military industrial complex that would enable China to manufacture similarly high-quality armaments.

Wei Yuan also argued that the success of Western armies was based upon the quality of their military personnel. Every Western army paid both high wages and good benefits, a requirement in the modern world of training, discipline, and action under fire. Wei Yuan advocated China's development of a military pay structure that would attract strong, intelligent, and loyal recruits.

Wei Yuan noted that once the nation made these basic changes, it must then develop the correct plan of implementation utilizing both military and diplomatic strategies. He believed that China needed to realize that it did not possess the military power to actively engage potential adversaries either in the South China Sea or along its coastline and instead should concentrate on protecting its inland waterways where it could use its vast territory and large population to its best advantage. Many military historians believe that Wei Yuan was the first to conceive of the strategy of a "retrograde defense," based upon drawing a potential enemy deep into one's own interior, isolating and then destroying it.

Like most intellectuals of his day, Wei Yuan believed that the use of the military must never be the first choice, but should be considered only when all other diplomatic alternatives have been exhausted. It was thought that a great leader should always use a combination of military alliances and international trade as the foundation of foreign policy. The ancient tradition of using one "barbarian" to control another was still relevant, and an extensive knowledge of cur-

rent events was a necessary tool in advancing this strategy. Positioning one's nation to take advantage of the current imperialist competition among the industrial nations could one day produce fruitful results. Wei Yuan also adhered to the concept that trading partners rarely entered into military conflict with one another, and he lobbied extensively for China to open its doors to foreign trade.

The second great strategist of the post-Opium War period was Feng Guifen (Feng Kuei-fen; 1809-1874). Like Wei Yuan, he believed that China should adopt Western weaponry, but that it should also master the new scientific and technological knowledge that formed the theoretical foundation of this new world order. He believed that China's military security was linked to the reform of its educational system. In the future, Chinese schools would have to offer courses in modern mathematics, chemistry, physics, and astronomy. Feng Guifen advocated these reforms as part of a Self-Strengthening Movement (1861-1895) that would propel China into the twentieth century.

The late nineteenth century witnessed the rise of a group of military philosophers who based their work on the teachings of Confucius (551-479 B.C.E.). They referred to themselves as Confucian rationalists, and believed that China's future was to be found in a combination of Western science and Confucian ethics.

The first of these Confucian military theorists was Zeng Guofan (Tseng Kuo-fan; 1811-1872), who occupied a position of authority within the Qing bureaucracy. He had received his military training under battlefield conditions when he was directed to organize the central Chinese militia during the Taiping Rebellion. As a result of this experience, he developed a military philosophy that in fact utilized both Western technology and Confucian philosophy. Tactically, he concluded that a commander should always follow the doctrine of the concentration of force. If one divides one's unit it will necessarily become weaker and give one's opponent the advantage. In conjunction with this fundamental reality, he created the overriding concept of the "master-guest" theory of the battlefield, arguing that the successful commander will always choose to be on the defensive, because the true position of strength is found in knowing both the adversary's objectives and tactics. A commander who initiates an engagement will be acting on insufficient information and will become the "guest" on the battlefield. In turn, a commander who waits until the enemy moves will have the necessary information to defeat the opposing force, thus becoming "master" of the battlefield. This strategy of battlefield defense employed two fundamental Confucian beliefs. The military philosophy of Confucius was based upon the ethical premise that aggressive offensive warfare was immoral. The only reason to use military force, according to Confucius, was in defense of the nation, and thus all military philosophy should focus on the development of defensive strategies. In addition, the Confucian system focused upon the development of a personal moral code, the concept Zeng Guofan adapted to his military theory. He believed that the most important element in any military doctrine was the human factor. An army consisting of an officer corps soundly grounded in Confucian philosophy could always be counted on to make the correct battlefield decisions. Zeng Guofan believed that most military failures were caused by hasty, ill-conceived actions made by officers who were driven by their own arrogance. He maintained that the unphilosophical soul was more concerned with personal glory, which would cloud one's judgment and lead to catastrophe. These two Confucian principles were the basis of Zeng Guofan's defensive strategy.

The second great Confucian strategist was Li Hongzhang (Li Hung-chang; 1823-1901), who as a young man scored at the highest level in the Confucian examination system. Like most of his predecessors, he believed that China had to develop the capacity to produce modern weapons. He was the first modern Chinese military philosopher to develop a combined-arms doctrine that employed both ground and naval forces in a strategic defense. Li Hongzhang believed that a modernized navy would still be unable to defend China's extensive coastline, and he recommended that the army be utilized to defend China's most important harbors and that the Navy be held in reserve and used against an invading force after the axis of attack had been established.

The Confucian worldview, especially in its focus on the importance of good education, played a prominent role in the development of Li Hongzhang's doc-

trine. Li Hongzhang advised the Qing government to change the examination system that was used to recruit members of the officer corps to reflect the technical expertise necessary to successful operation on the modern battlefield. He wanted to develop a truly integrated curriculum that emphasized both traditional ethics and modern technology.

The Qing government, however, placed too much emphasis upon modern weaponry and not enough on the creation of a system that would attract and keep officers of the highest quality. When China engaged Japan in the First Sino-Japanese War, this weakness undermined the effectiveness of the Chinese army and resulted in a humiliating defeat.

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Most of the ideas of the nineteenth century Chinese military theorists can be found in publications of their collected works. The most respected publication of the period was written by Wei Yuan. In *Haiguotuji* (1844; also known as *Hai-kuo t'u chih*, an illustrated handbook of maritime countries), Wei formulated the basic principles of nineteenth century Chinese military thought.

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Richard D. Fitzgerald

Imperial Warfare

Dates: 1857-1945

Political Considerations

The one hundred years between 1850 and 1950 constituted one of the most violent and troubled periods in all of recorded history. It witnessed the growing reliance of governments on military power to resolve European and colonial disputes, the competition for dominance among ideologically opposing camps, and the loss of millions of lives in wars. Yet, at the same time, this age experienced increased prosperity, enhanced longevity, and the ascendancy of liberal ideals that were focused on eliminating the causes for the distress. In 1857 Britain experienced the Sepoy Rebellion in India, when Muslim soldiers refused to bite pork-greased cartridges that were required for a new rifle. Although Britain suppressed the revolt and established direct control over India, the Sepoy Rebellion exemplified the cultural divide between the European powers and their non-Western colonies. The revolt was more than a resistance to the British affront to Muslims; it was a reaction to Britain's foreign presence and power.

Between 1870 and the outbreak of World War I in 1914, European nations frequently were involved in colonial disputes and wars while peace was sustained on the European Continent itself. The most active imperial powers were Britain, France, Italy, and, after 1885, Germany, the United States, and Russia. Imperialism gained support in the 1870's under the leadership of British prime minister Benjamin Disraeli (1804-1881), the new leaders of the French Third Republic, and the government of Kaiser Wilhelm (William) II (1859-1941) of Germany. They believed that imperialism reflected the natural state of affairs, demonstrated national power, and provided sources of raw materials and markets for manufactured products. Within increasingly democratic societies anti-imperialists, such as William Ewart Gladstone (1809-1898), developed support and, on occasion, gained power.

The principal colonial rivalries prior to 1900 focused on Britain, the preeminent imperial power. The French opposed Britain in the Middle East, constructing the Suez Canal, but they lost the canal and their influence in the region when Disraeli managed to acquire for Britain a controlling interest in the canal in 1876. Later, France and Britain were almost brought to the point of war during the Fashoda Incident (1898-1899), which involved control of the Upper Nile and hegemony in East Africa.

The British were also colonial rivals of the Russians. In 1878 Disraeli thwarted the Russian military successes against the Ottoman Turks (1877-1878); as a result of the Treaty of Berlin (1878), Britain obtained Cyprus, and Russia only partially achieved its objectives. Britain and Russia opposed each other in the Anglo-Afghan Wars (1839-1842; 1878-1880) and were competitors in Persia and China. In 1891 France and Russia entered into an alliance directed at a defensive war with Germany. The Germans allied themselves with Austria-Hungary and Italy. In 1898 Britain began a move away from political and diplomatic isolation. Although the initial preference was for an agreement with Germany, Britain was rebuffed and sought to resolve its colonial disputes.

In 1902 the Anglo-Japanese Alliance was formalized; it required the signatories to adopt a position of benevolent neutrality in the event that one of them was attacked by a third party. In 1904 the Anglo-French Entente, or the Entente Cordiale, resolved the colonial dispute between France and Britain over Africa. Britain agreed to recognize Northwest Africa as a French sphere of influence, and France recognized Northeast Africa as a British sphere of influence. Despite British support for Japan in the Russo-Japanese War (1904-1905), the colonial disputes between Russia and Britain were addressed in the Anglo-Russian Entente of 1907. Britain received Afghanistan and the southern third of Persia as spheres of influence;

IMPERIAL HOLDINGS IN AFRICA AS OF 1914

Russia obtained the northern third of Persia and shared with Britain the opportunity to economically exploit central Persia. Both parties recognized Tibet as part of China. Relations between the German Empire and the Anglo-French-Russian alliance were strained over German involvement in Morocco, East Africa, and the Far East. During this period the United States emerged as an imperial power, with

participation in the Spanish-American War (1898) and expansion in the Pacific. As a result of the war with Spain, the United States acquired Puerto Rico and the Philippines. The United States seized Hawaii from a native government and occupied several islands, including Pago Pago, in the South Pacific. The United States and many European states were involved in the internal economic life of the decadent Qing Dynasty in China. In 1900 the Boxer Rebellion, motivated by the Manchus and reflecting antiforeign sentiment, was put down by an international military force.

With the outbreak of World War I in 1914, the contending parties extended the conflict to their colonies. German positions in Africa and China were vulnerable, and the British and French defeated the German forces. In January, 1918, U.S. president Woodrow Wilson (1856-1924) advanced his Fourteen Points as a basis for a peace settlement. Incorporated into the document was a clear anti-imperialist sentiment; Wilson wanted a world without empires, in which the independence and interests of native populations were respected. Although the Paris Peace Conference (1919) paid token attention to this view, it was ignored in the text of the treaty. Nonetheless, Wilson's anti-imperialism had the support of many Europeans who believed that imperial rivalry had contributed to the outbreak of the war. During the 1920's anti-imperialism gained momentum. Britain moved toward granting independence to India. More important, in the new Soviet Union, the communist leaders denounced Western imperialism and urged all native peoples to revolt.

Also during the 1920's a new totalitarian ideology called fascism grew in influence, coming to power in Italy in 1922, in Germany in 1933, in Spain in 1939, and in Japan in 1940, although the turn toward fascism in Japan had begun during the 1920's. Unlike the liberal democracies, the fascist states supported the continuation and expansion of their empires. They challenged the progressive view of society in which liberty and individual values were valued. Authoritarian and antidemocratic, the fascist states advanced a corporate political agenda that emphasized collective or national and racist values at the expense of individual freedoms. The resulting conflict, World War II (1939-1945), between Germany, Italy, and Japan and the Western democracies and the Soviet

CARIBBEAN THEATER OF THE SPANISH-AMERICAN WAR

Union, was the deadliest and most gruesome conflict in history. The victors came to recognize not only the folly of imperialism but also its drain on national economies. Regrettably, the Cold War (1945-1991) between the Soviet Union and its allies and the Western democracies resulted in extending variations of imperialism as the two camps competed for global support.

MILITARY ACHIEVEMENT

The significant military achievements of the imperial era were the successful defense and extension of the British Empire during the Zulu War (1879), the Anglo-Afghan Wars, and World Wars I and II; the notorious defeat of Ethiopia by Italians; and the American reacquisition of the Philippines from Japan. In 1879 the Zulu King Cetshwayo (c. 1832-1884) defeated the British in the Battle of Isandhlwana on January 22, 1879, and threatened the British position in South Africa. Britain responded, defeating the Zulus in the Battle of Ulundi on July 4, 1879, and neutralizing the Zulu threat.

British wars against Afghanistan in the 1870's and 1880's were directed at local chieftains and the Russians who could threaten the northern gateway to India. In both instances British influence prevailed and, in 1907, Russia recognized the British influence in Afghanistan. In both World Wars I and II, British colonial power was threatened. In 1914 and 1915 German units threatened the British in East Africa near the Bandu River but were defeated by Britain's regular and colonial military resources.

In 1934 Italy, which had long entertained aspirations to acquire Ethiopia, seized the opportunity to create a war-in-sight crisis when Italian and Ethiopian troops clashed at Ualual in a dispute over the border between Somaliland and Ethiopia. During 1935 the European powers attempted to mediate the dispute; the French foreign minister sold out Ethiopia by giving the Italians a free hand. In October, 1935, Italian army and naval units started an invasion of Ethiopia. The League of Nations denounced the Italian aggression but lacked the resolve and the forces necessary to implement its position. In May, 1936, Italian forces occupied Addis Ababa after a spirited resistance by the Ethiopians and, in the same month, they announced the annexation of Ethiopia. The Italian military action involved mechanized forces including planes and tanks; they were opposed by poorly equipped Ethiopians who could not mount a defense against such power.

After the Spanish-American War the United States acquired the Philippine Islands. A politically reluctant imperial power, the United States was moving the Philippines toward self-government in the 1930's. Shortly after the Japanese attack on Pearl Harbor on December 7, 1941, the Philippines were attacked and an invasion was initiated. By May 6, 1942, the last American outpost, the island fortress at Corregidor, had fallen to the Japanese. The United States, confronted with a global struggle, never lost sight of its defeat in the Philippines. On October 19, 1944, the United States launched a successful amphibious invasion of the Philippines under the leadership of General Douglas MacArthur (1880-1964); the Japanese forces were removed in 1945. In the struggle for the Philippines, the United States relied on active support from native resistance forces and on the general sympathy of the populace. Shortly after the war was won, the Philippines were granted full independence in 1947.

WEAPONS, UNIFORMS, AND ARMOR

The development of weapons during this imperial period constituted a revolution in armaments. This age witnessed the transformation in personnel from the mounted warriors of the Charge of the Light Brigade (1854) to pilots of German jet fighter planes. It also experienced the radical changes associated with modern gunnery and artillery, the invention of automatic and semiautomatic firearms, mechanized armor (tanks), the submarine as a strategic weapon, the impact of telecommunications on war, and the birth of the modern aircraft carrier task force. Many of these developments had a significant impact upon imperial warfare. Collectively, the dramatic cost of modern warfare led, almost in itself, to the end of empires.

P. F. Collier and Son

In 1857, Muslim soldiers in India refused to bite pork-greased cartridges that were required for a new rifle. Although the British executed such rebels and established direct control over India, the Sepoy Rebellion exemplified the cultural divide between the European powers and their non-Western colonies.

By the end of the nineteenth century smokeless powder and bolt-action and magazine-repeating mechanisms had been developed and adopted by most major armies. The machine gun, capable of firing hundreds of rounds per minute, had been perfected. The French Hotchkiss, Austrian Schwarzlose, British Lewis, and American Browning guns were among the more advanced machine-gun models produced. The impact of these weapons in colonial wars against poorly defended or undefended native peoples was devastating. The imperial powers viewed these technical innovations as important because they were cost-effective and reduced the number of regular troops that had to be assigned to the colonies.

New cannons and artillery pieces advanced the effectiveness of the earlier Armstrong guns that had been deployed effectively against the Maoris in New Zealand and in China during the Opium Wars (1839-1842) that secured for Britain the control of Hong Kong. With grenades, grenade launchers, and rocket-propelled weapons, the European and American governments continued to develop a dazzling array of lethal weapons that were designed for defense from one another but which also could be used to suppress native populations. The new weapons technology, with planned obsolescence, established a built-in arms race that became an important component in global culture. By 1940 the U.S. Army was equipped with the very efficient, gas-chamber-powered, semi-automatic M1 rifle.

Combat uniforms evolved during this period from the brightly colored and decorated uniforms of the past into more practical uniforms that concealed the troops from the enemy. Combat in imperial wars resulted in the adaptation of standard uniforms in ac-

cord with the local conditions; uniforms were made of varying weights to provide comfort in diverse climates.

The advent of steel and the need for mobility in the field resulted in less and lighter armor for the individual soldier. The most important component was the helmet, which protected the soldier's head from rifle fire as well as from shrapnel from artillery, grenades, and mortar fire. Reinforced steel also protected heavy gun emplacements, fortified riverboats, fortified trains and transports, and other military devices that were used in imperial wars.

MILITARY ORGANIZATION

Military organization during the era of imperial warfare reflected the movement toward a trained professional officer corps, the importance of strategic and tactical planning, the need for continuous preparedness training, and the value of utilizing science and technology in advancing weaponry. The model of the German General Staff was replicated throughout Europe with varying success. Although the European nations developed plans for the deployment of multidivision forces in the event of hostilities at home, their approach to military organization at the imperial level was much more limited.

Because of costs, all of the imperial powers attempted to develop reliable local forces that included natives at the soldier and noncommissioned officer levels; they were led by European officers. Further, in most instances, the organization of the defense of imperial colonies was predicated upon sustaining a supply line to the mother country through which reinforcements could be sent if necessary; a reliable navy was required to support a global empire. Without doubt Britain had the most sophisticated imperial military organization. Not only did Britain have the means to support its dominions and crown colonies in the event of attack, but it also developed plans for the colonies to support Britain in the event of a European or global conflict. This imperial military organization was effective during periods of peace or occasional local conflict, but, with the exception of Britain, for most nations it proved ineffective because of inadequate forces and the precarious nature of the lines of supply.

DOCTRINE, STRATEGY, AND TACTICS

Central to an understanding of the doctrines, strategy, and tactics employed in imperial warfare is the recognition of four major points. First, colonial wars between European industrialized nations were frequently fought using the same concepts and practices that would have been used in Europe. In most instances, the number of troops was considerably fewer and there were adaptations to the locale and conditions. Nonetheless, colonial encounters such as those at Fashoda were approached using the same conceptual framework.

Second, in situations where native forces or populations were involved, innovations were mandated; guerrilla warfare had to be met with a nontraditional response. In most instances, Europeans and Americans relied increasingly on technological innovations in weaponry to defeat colonial opposition. For example, the use of advanced naval and airpower assets had some limited success in defeating native forces. However, as national identity or ideologically driven revolts increased, Europeans and Americans recognized that control of the land could not be achieved by technology alone.

Third, it is important to recognize that the political support for imperialism within European and American societies varied greatly during the century from 1850 and 1950. Indeed, as indicated previously, most European and American generations included an active component opposed to imperialism and imperial wars. European and American leaders found themselves condemning the imperialism of Nazi Germany and Fascist Italy and Spain but defending their own imperial policies; the legitimacy of imperialism was undermined by values and beliefs inherent in democratic liberalism.

Finally, it is important to recognize that all twentieth century wars have been viewed as national struggles. Although the level of commitment may vary, a general political will to fight is considered a requirement. Thus, in the postimperialist era of the 1960's,

with the absence of such a will, there was an abandonment of colonial struggles that were not defensible on the grounds of national defense.

The most significant factor that altered military doctrine, strategy, and tactics was the revolution in industry, technology, and communications that began in the mid-nineteenth century. Military strategists had to consider the rapid deployment of troops and the delivery of firepower through new weaponry. The advantage provided by new weapons was short-lived; enemies quickly adjusted and developed effective countermeasures. Ongoing weapons development became essential. The combination of modern military technology with successful strategies and tactics allowed for the deaths of millions of people. The resulting carnage led to a consensus against the continuing cycle of warfare, manifested in the twentieth century establishment of the League of Nations, the United Nations, and the European Union.

CONTEMPORARY SOURCES

Strategic military theory and practices were elevated to a professional level with the emergence of general staffs and the educational support services that emerged in the post-Napoleonic period. Throughout the period of imperial warfare strategists and tacticians considered Napoleon Bonaparte's military planning and successes. Likewise European military thinkers studied the relevant memoirs and works on strategy and tactics that became available in great numbers following the American Civil War.

National military colleges and schools, such as the United States Military Academy at West Point, New York, trained generations of officers in strategic military theory and practices. One of the most renowned contemporary sources of this era was Alfred Thayer Mahan (1840-1914), who wrote *The Influence of Sea Power on History, 1660-1783* (1890) and *Naval Strategy Compared and Contrasted with the Principles and Practices of Military Operations on Land* (1911). Another was General Alfred von Schlieffen (1833-1933), author of the famous Schlieffen Plan (1905), a German war strategy that became operational in August, 1914, with the outbreak of World War I. The primary military theorist of the late 1930's was Field Marshal Erich von Manstein (1887-1973), whose Blitzkrieg tactics were successful during the early years of World War II.

Other influential contemporary sources were Helmuth von Moltke the Elder (1800-1891), the military architect in the unification of Germany and the author of *Moltke's Militärische Korrespondenz aus den Dientschriften des Krieges* (1866; *Moltke's Projects for the Campaign of 1866*, 1907) and the Russians Vladimir Ilich Lenin (1870-1924) and Leon Trotsky (1879-1940), the architects of the 1917 Russian Revolution. Advocates of mechanized forces included Heinz Guderian (1888-1954), Basil Liddell Hart (1895-1970), and J. F. C. Fuller (1878-1966). Giulio Douhet (1869-1930) and William "Billy" Mitchell (1879-1936) recognized the importance of airpower and its impact on all aspects of warfare. Warfare in the colonies was considered by T. E. Lawrence (1888-1935), Mao Zedong (1893-1976), and Joseph-Simon Gallieni (1849-1916).

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William T. Walker

WARFARE IN THE INDUSTRIAL AGE

The Age of Bismarck

Dates: 1863-1890

Political Considerations

The Congress of Vienna, held to settle European affairs after the Napoleonic Wars (1793-1815), completed its work in 1815 after deciding not to unite the German states, creating instead the German Confederation of thirty-nine principalities that replaced the Holy Roman Empire. Austria, the leading German state, was ruled from Vienna by Germans but also included a dozen other nationalities. The strongest of the remaining German states, Prussia, stretched across north-central Europe, its western end separated from its eastern, its pride drawing it to claim leadership of the non-Austrian Germans, and its power unequal to the project.

When Austria was weakened in 1848 by a liberal revolution in the capital and indifferent performance in putting down an uprising in its Italian provinces, Prussia dared support the Frankfurt Parliament's proposal of a league of the northern German states. The Austrians mobilized for war and Prussia had to endure a humiliating loss of face. In 1862 the ultraroyalist diplomat Otto von Bismarck (1815-1898) became Prussian foreign minister and president of the cabinet. He immediately took up the project of unifying the northern Germans. When the king of Denmark, a former Austrian ally, died in 1863, Bismarck perceived Austria's isolation. Austria could expect aid neither from Russia, with which it was at odds over the Balkans, nor from France, which supported the Italian struggle to drive the Austrians back beyond the Alps. Bismarck created a diplomatic crisis that united Austria and Prussia in a successful war against the Danes in 1864, then saw to it that serious friction arose between the victorious allies. The resulting Austro-Prussian War (1866) defeated Austria in only seven weeks and gave Prussia unquestioned leadership of the northern Germans. When Bismarck provoked the French emperor Napoleon III (1808-1873) into a rash declaration of war in 1870, France was isolated because both Italy and Austria feared the speed of German mobilization. France fell in six weeks, though the mopping up took several more months. The German Empire, a union of all the Germans outside Austria, was proclaimed at the Hall of Mirrors in the Palace of Versailles in 1871.

Military Achievement

In 1864 Prussia took advantage of a diplomatic contretemps to join with Austria in wresting the provinces of Schleswig and Holstein from Denmark. The best way to force the issue was to overrun the provinces, which the Prussians and Austrians were able to

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Otto von Bismarck, Prussian statesman and engineer of German unification.

do because of the speed of Prussian mobilization, the élan of the Austrian troops, and the effectiveness of Prussian fire tactics. When Prussia made war on Austria in 1866, its aim was to advance three armies as quickly as possible into northern Austria to forestall an Austrian invasion of Prussia and to create the opportunity for an encirclement of Austria's main force. The Austrians, forced to fight against both the Prussians in the north and the Italians in the south, mobilized in a leisurely fashion, preferring to fight a defensive battle anchored on one of its fortresses, thus missing the opportunity to deal with the Prussian armies individually. Although its northern army escaped encirclement at the Battle of Königgrätz (1866), Austria lost 44,000 men to 9,000 Prussians and had to sue for peace.

Because of its 1866 victory, Prussia was able to persuade many German states to join effectively in league with Prussia and create a far larger army, the Army of the North German Confederation. During the 1870 diplomatic crisis with France, this force was able to appear on France's eastern frontiers with incredible speed and to force its will upon the French army. By contrast, French mobilization was slow and confused—the strategic plan little more than a pious wish to march to Berlin via the Palatinate—and coordination between its armies was almost nonexistent. Using superior artillery to great advantage, the Prus-

UNIFICATION OF GERMANY, 1863-1871

sians pinned one French army in Metz and forced the other to surrender along with Emperor Napoleon III, then proceeded to besiege Paris and dictate their terms of peace.

WEAPONS, UNIFORMS, AND ARMOR

One of the decisive events in weapons technology during the era of Bismarck was the invention of the Dreyse needle gun, which the Prussian army adopted in 1848. A breech-loading rifle, Dreyse's weapon used a needle-shaped firing pin to strike a percussion cap of fulminate of mercury in the middle of the powder charge. This mechanism made possible a rate of fire five to seven times faster than that of troops using muzzle-loaders. The Dreyse's firing pin eroded quickly, its breech was so badly sealed as to endanger the user and dissipate velocity, and the stiffness of its bolt action was such that troops in battle sometimes had to hammer it open or closed with a rock. The weapon was sighted to 400 yards. The chief objection made to its use was that it would lead to huge wastage of ammunition, leaving its users defenseless as a battle progressed. Helmuth von Moltke the Elder (1800-1891), the military architect of the unification of Germany, insisted that training would develop fire discipline and forced the Prussian army to rely on fire tactics. The Austrians were going in the other direction. In their 1859 war with Piedmont and France, the Austrian troops were armed with the Lorenz, an excellent muzzle-loading rifle that was sighted to 600 yards. Because of their unfamiliarity with the new weapon, which had a slow loading sequence, the Austrian troops could not use it correctly and were mowed down by the bayonets of the French, who attacked in shock columns. After the war, Austria decided to use the column rather than the line as their battle formation and came to regard the Lorenz rifle as merely a good mounting for a bayonet.

Sobered by the way in which the needle gun had cut huge swaths in the Austrian army at the Battle of Königgrätz in 1866, the French army adopted the breech-loading rifle invented by Antoine-Alphonse Chassepot (1833-1905), a vastly improved needle gun. Because the percussion cap was at the rear of the cartridge, the needle was shorter and eroded less; a superior breech seal made the weapon safer and effective at 1,600 yards.

Library of Congress

Helmuth von Moltke the Elder, chief of the Prussian General Staff and the military architect of the unification of Germany.

Rapid improvements in artillery also changed the battlefield. Using a mixture of bronze muzzle-loaded smoothbore cannon and unreliable breechloaders that tended to explode and butcher their crews, Prussia's artillery was inferior to that of Austria during the Austro-Prussian War. Moreover, the Prussian gunners were inferior in both training and ability, giving the Austrians a fire capability one-third greater than that of their foes. In the next few years, however, the Prussians rearmed with the steel cannon whose rifling and superior breech mechanism deepened the battlefield to 7,000 yards. In 1870 the French were still using inferior bronze muzzle-loaders and had weakened their artillery with the addition of the *mitrailleuse*. An early Gatling-type machine gun with twenty-five crank-turned barrels, the mitrailleuse could deliver 150 shots per minute. The French army, however, did not site and use the mitrailleuse as it did later machine guns. Instead it placed them with the

artillery, dividing its batteries in thirds, with two six-cannon batteries and a battery of ten mitrailleuses. Because cannons had far greater ranges, the mitrailleuses were easily destroyed by Prussian fire, and the system was an overall weakening of the French artillery capability.

MILITARY ORGANIZATION

The sizes of armies increased remarkably in the nineteenth century, and their control became possible only through their organization into two or more corps, each the size of an eighteenth century army. Each corps was then organized into two or more divisions to facilitate command and control. Professional general staffs became increasingly necessary to plan and support mobilization, logistics, and operations. However, not all nations adopted the general staff system. Those that did develop such staffs often employed them merely as clerks to field commanders.

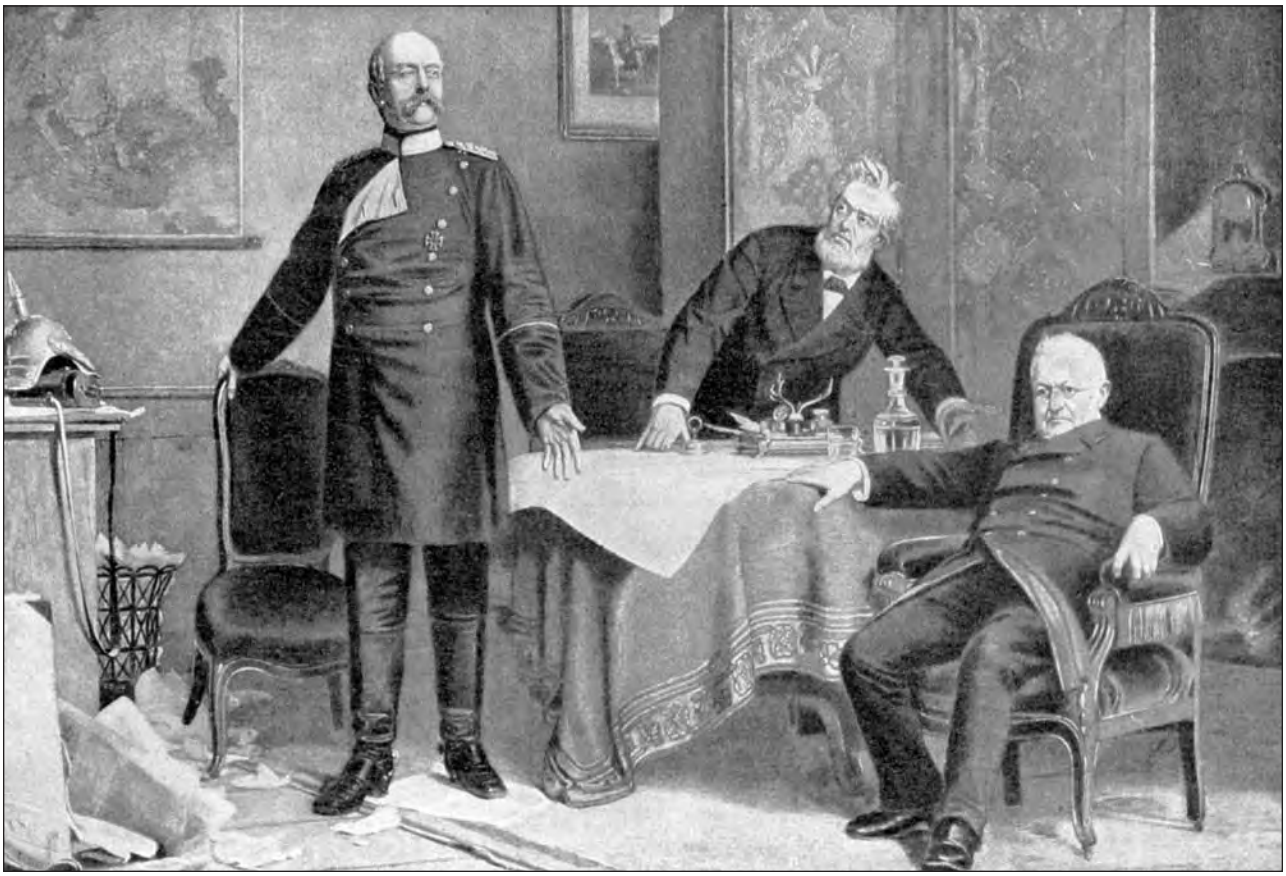
Helmuth von Moltke became chief of the Prussian General Staff in 1858 and strengthened it by selecting only the most outstanding graduates of the military academy to undergo staff training. Some of these officers then moved into field commands. Those who remained with the staff were rotated periodically into field armies. In this way, the barriers between staff and field personnel were gradually erased, and each better understood and relied on the other. Moltke realized that the advent of mass armies meant that a general headquarters could deploy armies wisely only for strategic purposes and must leave tactical responsibilities to field commanders. Between 1858 and 1866, he and the Prussian minister of war, Count Albrecht von Roon (1803-1879), increased the Prussian army from 100,000 to 300,000 men. They bound the Landwehr, a citizen militia, more tightly to the regular army by requiring that Landwehr recruits come from the ranks of ex-regulars and by giving command of the Landwehr recruits to officers from the regular army. After the Prussian victory over Austria, Prussia was able to create the Army of the North German Confederation, using armies of the other German states organized into corps and subordinated to Prussian control. This army was able to put 983,000 men into action against France in 1870.

The lightness with which the Austrians took the institution of general staff is evident from the fact that in 1860 they made Ludwig von Benedek (1804-1881) both Chief of Imperial General Staff and Commander of the Army of Italy based in Verona. Four years later, Benedek arranged that the staff job go to his friend, Baron Alfred Henikstein, who promptly recommended that the position be abolished. When Benedek took over command of the Northern Army upon its mobilization in 1866, Henikstein went with him into the field while remaining as staff chief. Soldiers were recruited from all of the empire's nationalities for a seven-year hitch. Nine different languages were used in training, but only German was used for giving commands in battle. On the eve of war in 1866, Austria could put 528,000 men in the field: 175,000 in the north, 75,000 in Italy, the rest on fortress duty. An additional 150,000 were expected from Austria's allies among the other German states.

The French army suffered from inadequate military schools, lack of expertise in its officer corps, and a woeful lack of ability to plan, organize, and supply on any large-scale level. Its recruits were selected annually by lottery, one portion to serve for seven years and provide the nucleus of a long-service professional army, and the other to receive minimal training as a reserve. Impressed by the Prussian victory over Austria, the French in 1868 attempted to increase the size of their army by having the long-term recruits serve for five years as regulars and four years as reservists, while the short-term recruits were trained for five months as a reserve. Those who escaped the lottery had to enter a national guard in which they had two weeks of training per year for five years. This system meant that the regulars and reserves would number nearly 500,000 in 1870, 300,000 of whom could be mobilized in three weeks, while the national guard would number over 417,000, with about 120,000 available for service.

DOCTRINE, STRATEGY, AND TACTICS

From the beginning of the nineteenth century, fortresses became increasingly obsolete as the ever-



F. R. Niglutsch

Otto von Bismarck (left), with French ministers Adolphe Thiers (center) and Jules Favre, negotiating peace terms at the conclusion of the Franco-Prussian War in 1871.

larger armies masked them with troops to prevent sallies and simply maneuvered around them. The Prussians gradually came to view the aim of war as being to crush the enemy's army and to destroy his will and ability to resist. The Austrians, however, continued to expend huge amounts of money on fortress systems such as the Quadrilateral, a system of four mutually supportive fortresses in northern Italy, the northernmost of which guarded Bohemia, and a series of fortified areas on the French frontier.

The French first utilized the potential of railways for quickly mobilizing armies and used this ability to call a Prussian bluff in 1859. Spurred both by this episode and by the realization that Prussia was extremely vulnerable because of its level plains and geographical configuration, Moltke decided that Prussia needed war plans that emphasized extremely quick mobilization, rapid deployment, and a forward strategy that forced the enemy to fight on its own soil. He and Roon improved railways, adapting their trackage and the interior of their wagons for army use, and stringing telegraph lines along them for instant communication. In the war against Denmark, Moltke realized that railroads could be used for maneuvers as well as for mobilization and logistics. This insight, in combination with the needle rifle, led him to rely more on fire tactics than shock tactics.

The standard battle plan of the era emphasized shock tactics. The enemy's line would be disrupted first by cannonade, then by sharpshooting skirmishers and dragoons. The regular regiments would then surge forward in a massive assault to break the en-

emy line and unleash a cavalry pursuit of the disorganized survivors. Moltke envisioned using rifle companies such as skirmishers to disrupt the enemy line and carry out a tactical envelopment. In this way, small units trained in riflery and moving and shooting from cover could destroy far larger enemy formations. These small-unit tactics were the mirror image of the movement of armies, for Moltke envisioned spreading his forces into a wide net to envelop the enemy's army. Railroads enabled him to bring armies from different parts of Prussia and concentrate them at the point of battle. When this method of making war worked brilliantly against the Austrians, the French began to reevaluate their reliance on columnar shock tactics and to seek a doctrine built around finding and holding superior positions. Given their long emphasis on the role of morale in shock tactics and the offensive character of their war plan against Germany, the French had not resolved the problem by the start of hostilities in 1870.

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Invaluable contemporary accounts of the weaponry, strategy, tactics, and operations of Bismarck's wars are to be found in Prusso-German official histories, *The Campaign of 1866 in Germany* (1872), compiled by the Department of Military History of the Prussian Staff, and the five-volume *The Franco-German War, 1870-1871* (1874-1884), by the English War Office. The Austrian official history of the Danish war, *Der Krieg in Schleswig und Jütland in Jahre 1864* (1870; the war in Schleswig and Jütland in 1864) is by Friedrich von Fischer (1826-1907). The five-volume official French history of the Franco-Prussian War, *La Guerre de 1870/71* (1901-1912; the war of 1870-71) is more cold-eyed and rigorous for having appeared so long after the fact. Moltke's military writings are voluminous. The most useful for the period in question are *Moltke's militarische Korrespondenz aus den Dienstschriften des Krieges 1866* (1896; *Moltke's Projects for the Campaign Against Austria*, 1907) and *Geschichte des deutsch-französischen Krieges von 1870-71* (1891; *The Franco-German War of 1870-71*, 1891). A good selection is available in Daniel J. Hughes's edited volume *Moltke on the Art of War: Selected Writings* (1993).

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Joseph M. McCarthy

The "Great" War
World War I
Dates: 1914-1918

Political Considerations

Beginning in 1871, with the unification of Kaiser Wilhelm (William) I's (1797-1888) German Reich through the diplomacy of Chancellor Otto von Bismarck (1815-1898) and the efficiency of the Prussian Army, the balance of power in Europe began to change. The swift German defeats of Denmark in 1864, Austria in 1866, and France in 1870-1871 had created a central European state that alarmed all nine of its neighbors. France, clearly seeking revenge for its defeat and for the loss of Alsace-Lorraine, was ready to join other states in a coalition against Germany. Bismarck maintained friendly agreements with Russia and Austria, thus isolating France. By 1882 this agreement had culminated in a Triple Alliance of Germany, Austria-Hungary, and Italy, as well as a nonaggression understanding with Russia.

The Bismarck system was weakened by the 1887 refusal of German banks to extend new loans to Russia, causing the czar to turn to French bankers. After Bismarck's 1890 dismissal by Kaiser Wilhelm (William) II (1859-1941), the German treaty with Russia lapsed, and a Franco-Russian defensive military alliance followed in 1894. Britain's search for allies after the Second Boer War (1899-1902) led to an alliance with Japan, a 1904 colonial "entente" with France, and a similar understanding with Russia in 1907. Although Britain was not bound under the agreement to support France and Russia, and Italy had expressed reservations on its obligations to the alliance, the average European citizen saw the powers as rival camps—Triple Alliance versus Triple Entente. In 1914 neither the people nor the leaders of the larger European powers were planning for or seeking war, although they all sought military security and considered their windows of opportunity for military success. After the war broke out, the forces aligned with the Triple Alliance became known as the Axis, or Central, Powers. The forces aligned with the Triple Entente became known as the Allied Powers.

Whereas Russia had the manpower and Britain the sea power for a long war, Germany's chances seemed better in a short conflict. General Alfred von Schlieffen (1833-1913), the German chief of staff from 1891 to 1905, devised a plan for a quick march through central Belgium aimed at enveloping Paris within six weeks, so that some German troops could be entrained back to Berlin to save it from the slower advance of the Russians. This meant, however, that Germany would have to invade Belgium within a few days of any Russian mobilization. In the 1914 crisis following the assassination of the Austrian crown prince Francis Ferdinand (1863-1914) and his wife by pro-Serb extremists on June 28, 1914, Germany gambled that Russia would stay neutral while Austria defeated the Serbs. When the czar ordered mobilization on July 30, Germany's Kaiser Wilhelm II, Chancellor Theobald von Bethmann-Hollweg, and Chief of Staff General Helmuth von Moltke (1848-1916) all felt compelled to put the Schlieffen Plan into action, declaring war on Russia and mobilizing on August 1 to attack France through Belgium. In all the belligerent states of 1914, the leaders, press, and public felt sure that they had no choice but to fight, that their enemies had forced them to defend themselves.

Nationalism and moral righteousness fanned by newspaper jingoism excited overwhelming support for a war that was expected to be brief, with winners and losers determined by a few battles. Many young men were ready to volunteer for a bit of excitement before settling down. As Winston Churchill put it, "they sought adventure but found death."

The invasion of Belgium became a serious moral handicap for Germany. Allied propaganda built on this violation of neutrality and treaties with stories of atrocities in occupied Belgium that depicted the Germans as bestial criminals. Further, the German advance on Paris bogged down in stalemated trench warfare, and the German defeat of the Russians at Tannenberg in August, 1914, and at the Masurian Lakes in September, 1914, was not decisive, partly due to Austria's poor showing on the eastern front. Although a negotiated peace might have been possible at the end of 1914, public opinion was not prepared for it, and it would not have met the demand for future security against aggression. The German armies were successful enough in 1914 to overrun most of France's northern industrial zone. As they held off the Russians, the Ottoman Empire joined the Central Powers, the former Triple Alliance, in October, 1914, hoping to pay off old scores against Russia, Britain, and France. Japan also joined with Germany in August, occupying Germany's Far Eastern bases, especially that of Qingdao, in China's Shandong province.

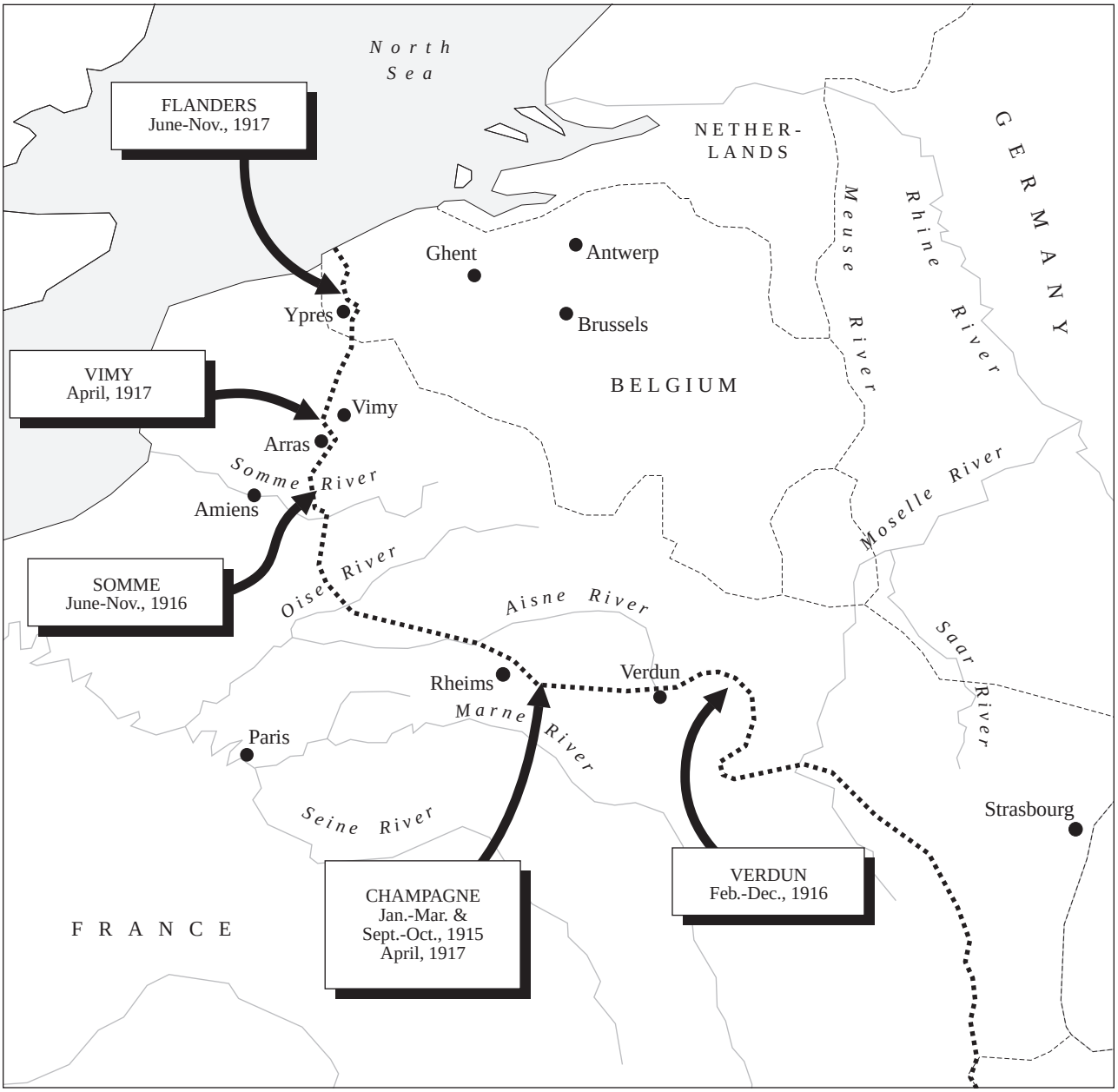
In 1915 French marshal Joseph-Jacques Césaire Joffre (1852-1931) mounted offensives that he termed as "nibbling" against the German troops, now commanded by General Erich von Falkenhayn (1861-1922). On the eastern front, the failure of Russia's offensive encouraged Bulgaria to join the Central Powers, combining with Austria to drive the Serb army out of Serbia. An August 6, 1915, Anglo-French naval attempt to open the Dardanelles, a narrow strait between Turkey and Europe, as a supply route to Russia failed. These debacles brought about a coalition cabinet in Britain, and Winston Churchill was dropped from the Admiralty. The British also committed an expedition to occupy Basra, a southeastern Iraqi port, and to move up the Tigris River toward Baghdad in Turkish Mesopotamia. Italy joined the Axis Powers, with the promise of land in the Trentino, the Tyrol, and the Dalmatian coast as well as extra-European colonies. In a further Eastern diversion, Axis troops occupied Salonika as a check to Bulgaria. Germany fell into a quarrel with the United States over American lives lost in the May 7, 1915, torpedoing of the British liner *Lusitania*. When U.S. president Woodrow Wilson (1856-1924) threatened war, the Germans promised in May of 1916 to restrict their submarine tactics to the nearly prohibitive terms demanded by the United States.

It was widely expected that 1916 would be a year of decisive battles. The Allied plan for simultaneous convergence on Germany was anticipated when Falkenhayn launched a major assault on French fortifications at Verdun in February. Russia's June attack on Austria, the Brusilov Offensive, encouraged Romania to join the Allies, while the British Expeditionary Force under Sir Douglas Haig (1861-1928) made a major attack on the Germans in the Battle of the Somme (1916). The Germans did not take Verdun, but they rescued the Austrians and overran nearly all of Romania. This success did not quite make up for a potato blight in Germany and a subsequent "turnip winter" for the civilians. In Mesopotamia the British advance army of 10,000 was defeated

Turning Points

Aug., 1914	German planes bomb Paris.
Sept., 1914	German U-9 submarines torpedo Allied ships.
Apr., 1915	First aerial "dogfight" takes place.
May, 1915	German zeppelins bomb London.
May, 1915	German submarine torpedoes the *Lusitania*, enraging the American public.
Aug.-Dec., 1915	Anglo-French attack on the Gallipoli Peninsula fails to exploit the "soft underbelly" of the Central Powers.
May, 1916	Battle of Jutland effectively ends German naval threat.
June, 1916	Limitations of heavy artillery bombardment exposed in the Battle of the Somme.
Apr., 1917	United States enters the war on the side of the Allies.
May, 1917	Allies establish Atlantic convoy system.
Nov. 20, 1917	British make a successful tank attack at Cambrai.
Mar., 1918	Following the Bolshevik Revolution of November, 1917, Russia leaves the war.

WORLD WAR I: WESTERN FRONT, 1915-1917



and surrendered. The May, 1916, naval Battle of Jutland proved a tactical success for Germany but a strategic success for the continuing British blockade. The British losses on the Somme were heavy, and the Easter Rebellion in Ireland rounded out another grim year. In the United States, 1916 was a year of preparedness rallies and appropriations. After his reelection, President Wilson asked both the Allied and the Axis Powers to state their specific war aims, but each side replied in vague terms. The restriction of territorial annexations gained support among those tired of the war, but there was no agreement on the

possession of the Alsace-Lorraine region on the French-German border.

By March of 1917, street demonstrations in the Russian cities of St. Petersburg and Moscow had become uncontrollable. Czar Nicholas II abdicated, and a government of moderates was formed, headed by Prince Georgy Lvov (1861-1925) and dominated by Aleksandr Kerensky (1881-1970). Attempts to continue the war were unsuccessful. Peace, bread, and land were the popular demands, and on that program, Vladimir Ilich Lenin (1870-1924) and the Bolsheviks took power in November, signed an armistice on December 15, and accepted a treaty at Brest Litovsk on March 3, 1918.

The German General Staff, headed since 1916 by Paul von Hindenburg (1847-1934), with Erich Ludendorff (1865-1937) as his strategic guide, viewed the Russian collapse as Germany's chance for total victory. The Germans calculated that an all-out submarine campaign would defeat Britain by 1918, that America would never risk sending troops across a submarine-dominated Atlantic, and that German soldiers from the eastern front would give the Reich the manpower it needed to crush France in 1918. Diplomatic alternatives were not explored. The resumption of unrestricted submarine warfare in February, 1917, was an open challenge to Wilson's policy. The so-called Zimmermann note, an intercepted German telegram made public proposing an alliance of Germany, Mexico, and Japan in war against the United States, was clearly a hostile act that Americans treated as such. The United States declared war on Germany on April 6, 1917. The United States chose to fight as an "Associated Power," against war and autocracy and for peace, humanity, and justice, without seeking territory as the spoils of victory.

After the failure of a French offensive in April, 1917, was followed by a mutinous "sit-down" in several French army divisions, General Henri-Philippe Pétain (1856-1951) became French commander in chief, restoring confidence with a strategic choice to "wait for the tanks and the Americans." The Italians were outgeneraled in the autumn Battle of Caporetto (1917), losing heavily in prisoners as they were driven from the Isonzo River back to the Piave River. These German successes, however great, could not make up for the facts that Britain had been saved by the transatlantic convoy system and that U.S. troops had begun arriving in France in June of 1917.

The Russian (Bolshevik) Revolution, which had also begun in 1917, and the American entrance into the war had, by 1918, given the war an increasingly ideological meaning. After the Bolsheviks published the Axis Powers' secret treaties, *The New York Times* editorialized that Russian revolutionary leader Leon Trotsky was "not a gentleman," but, in fact, the treaties' evidence of haggling over territorial loot insulted the sacrifice of millions of lives. The promise of self-determination, democracy, and justice espoused in both Wilson's program for a just settlement of the war, known as the Fourteen Points, and Lenin's propaganda encouraged separatism in

Popperfoto/Getty Images

Hunched British soldiers advance during the trench warfare of the Battle of the Somme (1916).

Austria-Hungary and the Ottoman Empire, as well as in Ireland and Asia. Ludendorff ignored the political trends and the possibilities of defensive strategy and gambled that he could find military victory in France with a well-planned attack and revised infantry tactics. His offensive broke the front and gained ground, but again the troops outran their reinforcements and supplies. When the Allies, finally united under the command of French marshal Ferdinand Foch (1851-1929), struck back in mid-June with the advantage of tanks and air support, the overextended German lines could no longer halt the Allied attacks. In September, Ludendorff declared victory out of reach, and in October the German chancellor asked Wilson for armistice terms based on the Fourteen Points. Negotiations proceeded as Bulgaria made terms on September 29, Turkey on October 31, and Austria on November 4. Part of the German navy mutinied on October 29, and an armistice delegation left Berlin for France on November 7. Demonstrations in Berlin led Kaiser Wilhelm to abdicate on November 9 and flee to Holland the following day. The German delegates, now representing a new government, signed an Armistice at Compiègne on November 11. President Wilson arrived in Europe on December 13, 1918, hailed as a powerful idealist bringing peace, democracy, justice, and security at the end of the "Great War."

Hulton Archive/Getty Images

A midget submarine pulls up beside a German U-boat in 1917.

Military Achievement

Germany's goal in the major theater of World War I was to defeat France by taking Paris within six weeks and then shifting troops eastward to stop the invading Russians. The drive for Paris failed. The Germans were stymied by problems with supplies and reinforcements that were multiplied with the distance from the German railheads, whereas the French used their own transport network, centered on Paris, for rapid countermoves.

Falkenhayn's 1916 attrition strategy in the attack of Verdun killed almost as many Germans as Allies and was basically unsound, given the Allied predominance in manpower. Colonel Max Hoffman's (1869-1927) 1917 campaign on the eastern front took advantage of the Russian Revolution to drive the Russians to accept German peace terms and created an opportunity for a negotiated peace that was acceptable to Germany. Ludendorff, in the west, preferred to gamble on submarines and a 1918 capture of Paris before American intervention could be effective. A better German foreign policy might have been the avoidance of a two-front war or the negotiation of an acceptable peace plan in late 1916 or early 1917. Germany's wartime aims for territory or dominance in Europe, Africa, and the Middle East were militarily impractical.

The French offensive aims never achieved their ostensible goals until the Ludendorff Offensive of 1918 depleted German manpower. Only then could the French achieve the obvious goal of gaining Alsace-Lorraine plus security. France's Plan 17 in 1914 was geographically unsound and misjudged the location of the German attack, but it drew the German battle eastward and away from Paris. Joffre's 1915 "nibbling" with bombardments was ineffective, and General Robert-Georges Nivelle's (1856-1924) "surprise breakthrough" in 1917 had been too widely advertised to surprise anyone. Pétain's defensive strategy gave the French army a chance to recover, a sensible goal after the French army mutinies of 1917. The French general staff was generally less effective than its German counterpart but made fewer costly mistakes.

The Russian goals of taking Berlin, threatening Vienna, and dominating Constantinople at least had the advantage of a numerous, courageous, and usually uncomplaining infantry. Against Austrian and Turkish forces, the Russians had many successes, limited only by inadequate transportation. Against the Germans, however, the Russian army officers seemed to be too preoccupied by the probability of defeat to act on the possibility of success. With a shortage of both experienced noncommissioned ranks and competent officers, the quality of Russian army leadership was so bad that the troops were losing faith in the army leaders, even as the home front was losing faith in the government and the czar.

Britain achieved some limited and peripheral goals: It prevailed narrowly in the Battle of Jutland; it maintained a blockade of the Central Powers; it brought world, and especially U.S., resources to the western front despite German submarines; it helped to finance the Allies; it did most of the fighting in Germany's African colonies, in the Middle East, and at the Dardanelles and Gallipoli; and it committed a sizable army to the western front. These were significant goals and achievements. Without victory over the submarines, there might well have been no Allied victory in the European theater. On the other hand, Germany's chief threat to Britain was economic, and on that score, the liquidation of Britain's overseas investments to finance the war benefited the United States more than it hurt Germany and was certainly an important step in Britain's later decline as a world power.

Austria did occupy Serbia in 1915, thereby more or less achieving Austria-Hungary's goal to eliminate Serbia as a factor in Balkan politics. It also held off the Italians until the collapse of 1918, but its campaigns against Russia lacked direction, and of course the 1918 wave of "self-determination" simply dissolved the polyglot Habsburg Empire. The Treaty of Versailles that ended the war in 1919 drew very restricted boundaries for Hungary and forbade the Austrian remnant from making any political or commercial union with Germany.

The Allied Powers had made generous territorial promises to Italy for joining them in 1915, and the Italian Army's military goal from 1915 to 1918 was to take the Austrian capital of Vienna. Adverse geog-

raphy and an army that was both poorly equipped and poorly trained stalled the Italians on the Isonzo River, until their defeat at Caporetto forced them to develop assault squads that finally won the Battle of Vittorio Veneto (1918) as Austria-Hungary collapsed. Even though Italy did gain the Trentino, Tyrol, and, later, Fiume, in the Treaty of Versailles, it still felt short-changed. The Ottoman Empire wished to gain territory, such as the Suez Canal, from the British, and land in the Caucasus from Russia, but was more successful in defensive campaigns, such as Gallipoli (1915-1916). In the Balkans, the Serbian army had been forced out of Serbia into Salonika, a French territory, but in the Treaty of Versailles, the Serbian premier gained leadership over the kingdom of Serbs, Croats, and Slovenes. Bulgaria had joined the Central Powers to invade Serbia but lost border enclaves in the Treaty of Versailles. Romania's goal had been to gain Transylvania, and despite a complete military defeat, did so at Paris; it had also regained Bessarabia from Russia under the earlier Treaty of Brest Litovsk. Greece had the distinction of being forced into the war by the British and French for modest territorial gains. Belgium had wanted Luxembourg but had no means of armed occupation. Japan's goal had been to acquire German bases and islands in the Far East, and its army and navy enforced these claims. Japan's military presence in Shandong and Siberia and its naval construction program aroused U.S. hostility.

The United States entered the war on April 6, 1917, participating in the battles of 1918 as an "Associated Power" on the Allied side. The American political goals were to defeat Germany, "making the world safe for democracy" and ending war by means of a League of Nations based on self-determination and justice. The U.S. military goal was German surrender.

WEAPONS, UNIFORMS, AND ARMOR

In 1914, as oversized armies met in the European theater, increased firepower made battlefields impassable for conventional infantry assaults. The previously ineffective *mitrailleuse* came into its own: Situated to cover enemy troop concentrations and used in short bursts to avoid overheating and jamming, these machine guns, whether water-cooled Maxims or air-cooled Hotchkiss types, fired 400 to 600 rounds per minute. Also, bolt-action repeating rifles, such as the German Mauser Gewehr 98, the British Lee-Metford, the Austrian Mannlicher Model 1895, the Italian Mannlicher-Carcano, the French Lebel M-1e 1886/93, the Russian Nagant, and later, the American Springfield, achieved a range, accuracy, and rate of fire unprecedented in European warfare. Battles of encounter became a story of heavy losses, entrenchment, barbed wire, and stalemate.

Light field artillery was used to attack the trenches, ranging from the 75-millimeter gun (known in French as the *soixante-quinze*) to the 105-millimeter howitzer. The Germans used 30.5-centimeter Skodas and 42-centimeter Krupps Big Berthas for howitzer shelling of the forts at Liège and Namur. Larger artillery, such as the "Paris gun," used by the Germans to shell Paris in 1918, had to be moved by rail. Antitrench bombardments, however, so cratered the terrain as to slow down the assault troops, a self-defeating result.

The mining of enemy trenches, as by the British at Messines Ridge in June, 1917, was effective but caused massive terrain dislocation and took a great deal of time for a limited gain. Flamethrowers were tried with good results at close quarters but without achieving major breakthroughs. Poison gas, under the right conditions, could break down a line of defense, but advancing in gas masks was slow work and some gases persisted for days. Repeatedly, attacking armies were hampered in moving men and supplies across ravaged battlefields while retreating armies drew on rapid support from the rail center it was defending. For most of World War I defense was a stronger position than offense in terms of reinforcement and supply.

Another defensive form, the blockade, dominated the war at sea, but undersea and aerial weapons threatened the traditional line of battle style of naval warfare. Submerged mines kept the British from entering the Dardanelles in 1915 and effectively kept them out of the Baltic Sea. Aerial reconnaissance at sea by dirigibles, blimps, and airplanes became a new factor, and German diesel-electric submarines did

Time & Life Pictures/Getty Images

U.S. infantry soldiers fire a 37MM machine gun at Germans during a battle in the Argonne Forest in 1918.

much more damage to Allied warships and world commercial shipping than did any of its surface warships. These submarines were also a major factor in the 1917 entry of the United States into the war, which ensured Germany's defeat.

Aerial warfare captured the imagination of the public, but the comparative airpower of the European states in 1914 is difficult to put in quantitative terms, because too many variables are involved. France apparently had from 200 to 250 serviceable airplanes. Germany had a few more, as well as zeppelins. Britain claimed only 35 planes but could be compared at 135. Austria-Hungary had 36, and Belgium 24. Russia purchased 250 foreign planes in 1913 to add to those of its own production but listed only about 100 total pilots. Wartime production greatly increased these numbers.

The first aerial reconnaissance and bombing began in 1914, when machine guns were mounted on airplanes. American aircraft designer Anthony H. G. Fokker (1890-1939) equipped his 1915 German planes with interrupter gears for forward firing through the propeller. Germany's zeppelins were useful only in long-range bombing, and its airplane production was limited by an inadequate supply of engines. During the war airplanes improved greatly in both general reliability and strength of construction. Pilots were not usually issued parachutes, giv-

ing them an incentive to land their planes safely if hit. Survivors could not remember any "dogfights" quite as crowded as those depicted in later Hollywood films.

Armored trains and armored cars were not new, but they could not cross trenches. In 1916, British Colonel Ernest Swinton (1868-1951) developed a "land warship," code-named "tank," with a caterpillar tractor-type continuous tread stretched over a long and rigid track. This tread gave the 30-ton vehicle the ability to cross trenches while carrying 6-pound guns or machine guns in side-mounted gun platforms as it advanced through the German defenses. In 1918 Britain produced a 14-ton Whippet model tank with a machine gun, and France introduced the 6.5-ton Renault Char-Mitrailleuse with a 360-degree turret. The British used a few tanks on the Somme in 1916 and successfully at Cambrai in 1917. Germany produced a few 30-ton tanks and only prototypes for a lighter machine. Germany's western offensive in 1918 depended chiefly on the use of captured Allied tanks. Despite their persistent tendencies to ditch or break down, tanks were the Allies' best new weapon in 1918. Although the tank became a tactical breakthrough weapon in World War I, it was not yet capable of leading a sustained offensive.

Several elements of civilian life came to have military significance. Trucks became necessary links between railheads and battlefields, although horses still pulled field artillery. Telephones and wireless telegraphy became variably useful. Voice radio would have been very useful for conveying reports and orders over large combat areas, but the transmitting and receiving equipment had a limited range.

By 1914 armor at sea had been maximized. Waterline "blisters" were added to battleships for protection against mines and torpedoes, but the addition of any more deck armor to protect against aerial bombs or the plunging fire of long-range shooting would have made ships top-heavy and ready to capsize. German compartmentalization and wider dry docks gave the Germans stronger ships at Jutland.

Armor on land principally concerned tanks. Although World War I tanks had enough armor to stop ordinary rifle or machine-gun bullets, .50-caliber or larger high-velocity bullets would penetrate them. The size of tank needed to cross trenches meant a large vehicle that was only thinly covered. Basically, tanks needed more horsepower, which ideally came from diesel engines.

European uniforms became discreetly drab after the Russo-Japanese War (1904-1905) showed the advantage of camouflage. Khaki or gray-green colors prevailed. Shoulder and collar patches identified different units and rank. Headgear, such as a forage cap, tin hat, turban, or fez, was distinctive. In 1914 the exceptions in uniform uniformity were the French, whose press and politicians had insisted on the troops' traditional blue coat and red trousers, and the Scots, whose kilts were covered by khaki aprons for the field.

MILITARY ORGANIZATION

The belligerents of World War I originally organized their military forces along the same general lines developed during the French Revolution (1789-1799). The head of the government or the war cabinet determined war policies for the army and navy. The service chiefs developed and executed the military war plans. This latter group was described as General Headquarters (GHQ) in Britain and the United States, as Grand Quartier Géneral (GQG) in France, as Stavka in Russia, and Oberste Heeresleitung (OHL) in Germany.

The land forces were divided into army groups of field armies composed of corps. The corps was an all-arms group including two infantry divisions, a cavalry brigade or division, an artillery brigade, and several support groups. The division continued to be a basic all-arms unit capable of independent action if ordered and composed of brigades, regiments, battalions, companies, platoons, and squads in diminishing order of size. A typical infantry division included headquarters personnel, two or three brigades of infantry, one or two regiments of field artillery, a squadron or up to a regiment of cavalry, a battalion or regiment of engineers, one or more signal companies (in the United States, this included airplanes as well as telegraph and radio), ambulance companies, field

hospitals, a base hospital, ammunition and supply services, and food services. European divisions might number 10,00 to 15,000, and U.S. divisions in Europe 25,000 to 30,000. Cavalry divisions were much less numerous in personnel. Some divisions were specialized, such as investment divisions for sieges or mountain (Alpine) divisions.

This multiplicity of functions meant that while battlefield firepower increased, the number of riflemen decreased in favor of the new special services. In military jargon, there was "less teeth and more tail," especially in the United States' overseas divisions. Indeed, some servicemen might find that apart from boredom, mud, and the danger of being killed or wounded, they were better fed and cared for than they had been in civilian life.

The development during World War I of infiltration squads and supporting assault battalions meant special selection, training, and organization for these shock troops, or combat teams, as they would later be called. At the time this separation of an elite infantry force was controversial for being potentially harmful to general army morale. Is is considered in some accounts as a factor in Germany's 1918 military defeat.

The new weapons of World War I were sometimes seen as a threat to senior army ranks. Young officers ambitious for promotion might be drawn to a new technical field, to which older officers found it difficult to adjust, and claim the need for an independent organization with its own system of funding, control, and promotion. Submarines were safely under navy control, and aircraft carriers could be limited, but a separate Royal Air Force, such as the British established in 1918, was an unwelcome competitor for shrinking postwar military budgets. There was widespread agreement that tanks should be nothing more than ancillary to infantry operations.

The general staff system of army administration, planning, and command, used with great success by Germany in the nineteenth century, was widely copied but with very mixed results in World War I. The German staff was efficient in the military field but calamitous in trying to shape general strategy and foreign policy. The French staff managed its generals fairly well but did not do much for the front-line soldiers. Otherwise, general staffs tended to defer to the commanding general without giving him needed information. Britain's imperial general staff suffered from the fact that the British had little regard for military desk jobs and opted instead for field commands. Although the United States had capable staff chiefs, it still seemed that General John Pershing did too much of his own staff work. On the whole, most countries felt that their own general staff needed improvement and that the German staff should be abolished. The abolition turned out to be only a matter of form.

Doctrine, Strategy, and Tactics

Nineteenth century military theory, attempting to borrow its principles of war from the French Revolutionary Wars (1792-1802), concluded that mass citizen armies had outmoded the older professional armies of the eighteenth century and that the offensive campaigns of French emperor Napoleon Bonaparte (1769-1821) showed how these mass armies should be used to win wars. The doctrine of the offensive became established at military academies. In the Crimean War (1853-1856), the American Civil War (1861-1865), the Wars of German Unification (1864, 1866, 1870-1871), and the Russo-Japanese War (1904-1905), victory went to invaders pursuing the offensive, although the cost to the attacking infantry increased. Breech-loading cannon and repeating rifles with longer effective ranges made frontal assaults increasingly costly, and railways gave defenders a quick deployment against any strategic flank attack. Although it took little training to fire a rifle from a defensive position, the half-trained recruits of mass armies might not be as willing and able to press home a successful bayonet attack.

In France the doctrine of the offensive became even more imperative as military leaders appreciated that the predictable speed of a German offensive aimed at Paris would need to be matched by a fast-moving Franco-Russian offensive converging on Berlin. According to the French high command, the French infantry would need to have the spirit, discipline, and courage to attack and win by the bayonet

against ever-increasing odds. The Germans held a similar philosophy.

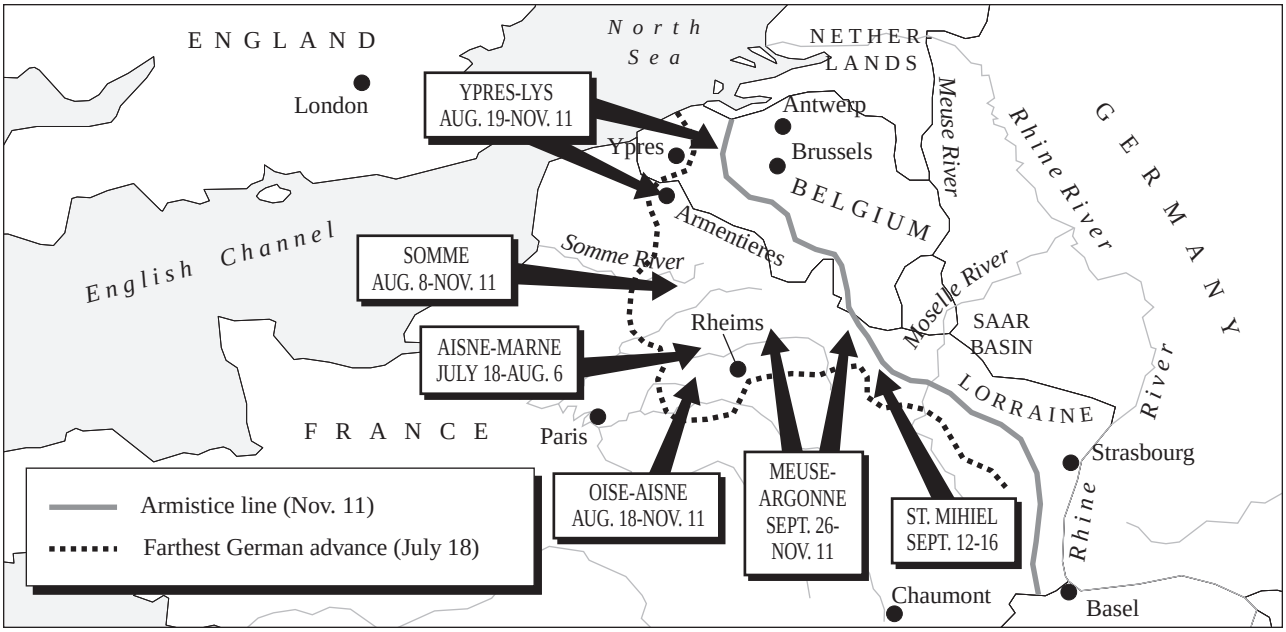
The western front battles of 1914 began as open-field encounters of deadly firepower that drove the troops into hasty trenches. The short lesson was "bullets kill men, and earth stops bullets." The dominant tactic from 1915 to 1917 was bombardment by more and bigger howitzers. This offensive was undeniably more wracking for the target infantry, and fatal for some outposts, but it destroyed the element of surprise and left a scarred no-man's-land of a battlefield that was too chewed up for an offensive advance. Extensive mining could destroy an entire enemy entrenchment, but again, the zone of destruction was difficult for the attackers to cross. This method was effective, but time-consuming and expensive. Attacks with poisonous gases were frequently surprising and damaging to the defenders but also caused problems for the attackers. Tank attacks were promising but not very effective in 1916 and 1917.

French general Nivelle promised a new kind of offensive when he replaced Marshal Joffre in 1917. On paper his plan did seem to incorporate some of the flexible infiltration ideas advocated by earlier theorists, but when the plan was fully explained to the politicians, and through the press to the public, including the Germans, its failure became inevitable.

"Vertical infiltration" was more successfully developed by the Germans for their breakthrough against the Russians at Riga (1917). The same methods accounted for some of the Austro-German success against Italy at Caporetto. The surprising strength of the Ludendorff Offensive in 1918 again showed the effectiveness of these methods. The Allies followed somewhat similar offensive methods later in 1918, but these tended to be tank-led breakthrough and penetration tactics against German troops who were increasingly willing to surrender.

Vertical infiltration, as developed by the Germans during World War I, was basically an infantry attack involving several new tactics. The spear point was to be a squad of fourteen to eighteen storm troopers, or (in German) *Sturmtruppen*, attacking on several principles. The first was the use of reconnaissance to find weak spots, infiltrating in surprise night penetrations, deceptive preparations, and short bombardments, moving forward, and bypassing strong points. After this initial infiltration, platoons, companies,

WORLD WAR I: OFFENSIVES ON THE WESTERN FRONT, 1918



and larger units would also move forward and widen the breakthrough. The infiltration squad would use light machine guns or portable submachine guns such as the Madsen, Bergmann, or Parabellum, as well as grenades and grenade launchers, light trench mortars, gas shells, and sometimes flamethrowers. Batallion support followed with machine gun companies, light artillery companies, and heavier, individually placed guns. Ideally aerial bombing and strafing would find targets of opportunity. The principle of momentum held that the assault and support units should always keep moving. The assault team included engineers to ensure that reinforcements, replacements, and supplies could be moved directly from the rear to the front.

Clearly, these were ideal principles. In practice, the logistical problems of moving equipment from the railhead to the forward storm troopers could not keep an advance going indefinitely. Also, many generals rejected the idea of elite storm troopers as bad for general army morale. However, the resemblance of these early troops to World War II German Panzer divisions and to later U.S. assault team formations is clear enough to show the eventual significance of these tactics for future offensives.

In Britain and France the lessons that generals learned in 1918 mattered less to the public, press, and political leaders than did the preceding four-year western front stalemate and slaughter. The doctrine of the offensive and the strategy of attrition were discredited among the postwar disillusioned, or "lost," generation. Without American or Soviet support, the remaining Allies adopted a defensive doctrine, believing that the Maginot line, a line of fortifications along the French-German border, and a British naval blockade would be enough to defeat Germany economically. This strategy was crushed by the German Blitzkrieg of 1940.

Contemporary Sources

The best prewar analysis of World War I fighting was that of Ivan Bloch (1836-1902), a Russo-Polish financier. His *The Future of War in Its Technical, Economic, and Political Relations: Is War Now Impossible?* (1899), a one-volume English-language summary of his work, displays outstanding military and logistical insight as well as a curiously poor grasp of wartime government finance. General Friedrich von Bernhardi's (1849-1930) *The War of the Future in the Light of the Lessons of the World War* (1920) was notable for its author's distrust of the Schlieffen Plan.

Once the shooting started, morale-boosting propaganda replaced news in press reports. German reporting was censored, and British, French, and Russian correspondents were not permitted in the war zones. "Official sources," meaning either an "information office" or a military service department, issued statements, which correspondents duly reported. Philip Gibbs (1877-1962), a popular British correspondent, collected his reports in wartime books such as *The Soul of the War* (1915).

Letters from soldiers at the front were a better source of information, and in 1914 some British provincial weeklies published these generally optimistic reports from local soldiers. Government censorship halted this practice by 1915, only allowing publication of handouts by government agencies.

U.S. publications from 1914 to 1917 generally followed the lead of British and French accounts but also included reports from the Central Powers. The Germans conducted journalists such as Irvin S. Cobb (1876-1944) on guided tours to verify their claims of success, reflected in Cobb's *Paths of Glory: Impression of War Written at or Near the Front* (1915). The British and French followed the Germans' example in 1915. U.S. newspapers and magazines were at least more balanced than those of the belligerents and somewhat more realistic in estimating the hardships of the war.

The Russian Revolution of 1917 was reported somewhat confusedly in the Western press. The Communist takeover was reported with reasonable accuracy by some British reporters, as well as the American John Reed (1887-1920) of *The Masses*, but much of the press was misled into following inaccurate reports in *The Times* of London and *The New York Times*, both of which pursued an anti-Bolshevik crusade as the war ended.

Many of the war's major participants, including Joffre, Foch, Pétain, Pershing, Ludendorff, Falkenhayn, Hindenburg, and Liman von Sanders, released postwar memoirs. Viscount Edward Grey's (1862-1933) *Twenty-five Years, 1892-1916* (1925) discounted his own influence on events. Georges Clemenceau (1841-1929) delivered a mordant verdict on human nature in *Grandeur and Misery of Victory* (1930). David Lloyd George's (1863-1945) war memoirs and memoirs of the Paris Peace Conference were somewhat feline about his late associates, especially Field Marshal Douglas Haig. Haig's letters and papers were finally published in 1952, revealing a surprisingly extravagant concern for petty grievances.

Diplomatic histories used government documents and memoirs, and American "revisionists" blamed either Russia and France or civilization at large for the war. Luigi Albertini (1871-1941) published an extensively researched three-volume history entitled *The Origins of the War of 1914* (1952-1957), which seems definitive. German historian Fritz Fischer has taken a highly critical and controversial view of his own country's responsibility for World War I.

Disillusionment with war's ideals and conduct was prevalent throughout the 1920's and 1930's. Gibbs's *Now It Can Be Told* (1920) revised the tone of his earlier reporting to accommodate the prevailing public sentiment. Arthur Ponsonby's (1871-1946) *Falsehood in Wartime: Propaganda Lies of the First World War* (1991) exposed Allied propaganda. America's chief propagandist, George Creel (1876-1953), explained how he had misled the gullible in *How We Advertised America* (1920). A legion of poets portrayed the slaughter of the war in emotionally horrific language, although Robert Graves (1895-1985) in *Goodbye to All That: An Autobiography* (1929) showed a nostalgic view of the bad old times. One literary critic cynically suggested that in the next war, poets should not be allowed in the trenches.

Most novelists took a jaundiced view of the war. *Tell England: A Study in a Generation* (1922), by Ernest Raymond (born 1888); *Education Before Verdun* (1936), by Arnold Zweig (1887-1968); *A Farewell to Arms* (1929), by Ernest Hemingway (1899-1961); *The General* (1936), by C. S. Forester (1899-1966); and the highly readable *Im Westen nichts Neues* (1929, 1968; *All Quiet on the Western Front*, 1929, 1969) by Erich Maria Remarque (1898-1970) all depicted the war in somber tones. Perhaps significantly, Fritz von Unruh's (born 1885) *The Way of Sacrifice* (1928) implied that the killing was justifiable, and Ernst Junger's (born 1895) *Storm of Steel: From the Diary of a German Storm-troop Officer on the Western Front* (1929) presented the war as at once terrible and glorious.

Letters and diaries from the trenches have remained as the best source on what the war was like for the average soldier. Among the many examples, J. C. Dunn's (1871-1955) *The War the Infantry Knew, 1914-1918* (1938), James Lockhead Jack's (1880-1962) *General Jack's Diary* (1964), and *Voices from the Great War* (1981), compiled by Peter Vansittart, are useful examples, although predominantly from the officer's viewpoint. Denis Winter's *Death's Men: Soldiers of the Great War* (1978) and Lyn Macdonald's *Somme* (1983) are perhaps the most successful articulations of the voice of enlisted men in World War I.

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K. Fred Gillum

The Spanish Civil War

Dates: 1936-1939

Political Considerations

In July of 1936, the government of Spain's five-year-old Second Republic, an unstable popular front composed of liberal democrats, socialists, and communists, came under fire from the political right. After failing to gain control in either February's election or the ensuing wave of assassinations, the National Front, an alliance of conservative democrats, monarchists, and fascist parties, including the militant Falange Española, now followed a clique of disloyal army officers in open revolt. The Spanish Roman Catholic Church sided with the revolutionaries.

Like these civilian political factions, Spain's armed services were divided. Ninety percent of the army's officers and fifty percent of its enlisted men chose to follow their rebellious generals. In the navy, however, the crews of all but three ships mutinied against rebel officers, and more than half of the air force remained loyal. Further confounding the Nationalist bid for an early victory were numerous unity of command problems. The Nationalist general Francisco Franco (1892-1975), who had opposed an earlier coup, emerged as the sole leader of the rebellion only after one potential rival had fallen to a Republican firing squad and another had died in a plane crash while attempting to return from exile. During the early campaigns, Falangist militiamen often mobilized and operated beyond the pale of Franco's authority. Carlists, who longed for the ultimate return of the monarchy, acted similarly. Although both Nazi Germany and Fascist Italy provided military aid, foreign intervention did not decide the war's outcome.

Whereas the socially disparate Nationalists gave vent to their hatred of the "Red Republic" by eventually conceding all command authority to Franco, Loyalist hatred for fascism occasioned no parallel sacrifice. Although fighting on the side of the Republican Popular Army, Basque and Catalán separatists continued to resist central authority, as did Spain's two most powerful trade unions and its anarchists. Like the Falangists and Carlists, these groups mobilized their own militias and frequently fought independently of the army they should have been assisting. Some Republican dissidents also fought against the Popular Army and the government it represented. This resistance was often provoked by members of Soviet military- and political-aid missions who reserved Soviet tank, artillery, and air support for communist formations. Soviet operatives assassinated some noncommunist Popular Front members as well. Tyrannical acts such as these eventually damaged Republican morale beyond repair.

Military Achievement

More unified in spirit than their enemies, the Nationalists were ultimately successful in their bid to overthrow the Republic. Nevertheless, several factors limited their efforts. First, because trade unionists sided with the Republic, the rebels had to take Spain's industrial centers by force; the two largest cities, Madrid and Barcelona, remained under government control until the war's final weeks. Second, Nationalist objectives, like Republican ones, were often chosen for political rather than military reasons. Third, because Franco often differed with his German and Italian advisers on tactics, troop dispositions, and objectives, some of the advantage that otherwise would have accrued from foreign military assistance was negated.

During the war's first phase, from July, 1936, to March, 1937, four Nationalist columns converged on the capital at Madrid but failed to break in, partly because of fanatical Republican resistance at University City, on the Jarama River, and at Guadalajara, and partly because Nationalist general Emilio Mola's (1887-1937) estimate that a "Fifth Column" of sym-

DIVISION OF SPAIN, 1936

pathizers would disrupt the defenses from within had proven unduly optimistic. Stalemated around Madrid, both Franco and his Republican counterpart, José Miaja (1879-1958), looked elsewhere for advantages during the war's second phase, from April, 1937, to February, 1938. Franco reinforced Mola's Army of the North and took the ports and industrial centers along the Bay of Biscay, whereas the next Republican offensives focused on Aragon, where in the spring of 1937, a handful of Nationalist troops were holding a 200-mile front. The Republic's Army of the East was slow to attack, and the Nationalists reacted, saving Saragossa (1937) and retaking Teruel (1937-1938). The Republic's loss of Teruel proved especially costly in terms of men, equipment, and the consequent loss of Soviet aid. During the war's final phase, the Republic was in a state of collapse, and only the rebels were capable of strategic offensives. Franco drove eastward to the Mediterranean in March and April of 1938 and isolated Catalonia from the remainder of Republican territory. In January, 1939, he took its key city, Barcelona. The defenses of

Madrid finally collapsed on March 27, 1939, ending a war that had cost more than 600,000 Spanish lives.

Weapons, Uniforms, and Armor

Despite some small-scale experimentation with tactical aviation and armor, the opposing armies were composed mainly of nonmechanized infantry. Often poorly supported and partially equipped with leftovers from World War I, the Riff War (1919-1926), and the Russian Civil War (1918-1921), both armies also used captured weapons extensively. Because the prewar Republic's standard-issue service rifle, the bolt-action, 7.65-millimeter Model 1893 Mauser, was in short supply, a number of substitutes appeared, including the Italian 6.5-millimeter Carcano and the Russian 7.62-millimeter Mosin-Nagant. Far less common were submachine guns, which included the Italian Beretta MP-28, the Soviet PPD-34, and the Spanish-built Lanchester. French military aid to the Republic included some World War I surplus air-cooled machine guns: the Hotchkiss Mk1 and the notoriously unreliable Chauchat. The Italian Breda 30 appeared more often in Nationalist ranks. Belt-fed, water-cooled machine guns of the Maxim-Vickers type were more common on both sides, but their heavier weight rendered them less suitable for highly mobile operations. The proliferation of rifle and machine gun calibers and types produced logistical nightmares for Nationalists and Republicans alike.

All but a few pieces of artillery on both sides were towed, and these guns, like the infantrymen they supported, were far more thinly scattered than they had been on the western front from 1914 to 1918. The road and rail networks of Spain could not have supported massive World War I-style artillery barrages or supplied World War-sized armies.

The numerous irregular units, foreign volunteers, and shortages of supplies during the Spanish Civil War gave rise to a multitude of uniform types, but there were a few frequently recurring features. The prewar Spanish Peninsular Army-issue khaki pants, khaki shirt with pleated patch breast pockets, and thigh-length *guerra* tunics were numerous on both sides. Civilian items were especially common in Republican ranks. These included corduroy pants and jacket, usually brown, the leather or cloth *cazadora* windbreaker, and the *mono*, a lightweight brown corduroy coverall. Although both sides used the Spanish M-1926 helmet, augmented by the Republic with French Adrian M-1916's and M-1926's, prewar-issue *isabellinos*, or forage caps, were more common in the two armies. Black, brown, and olive drab berets were especially common on the Republican side, but these colors rarely reflected the wearer's arm of service, as in other armies. The red beret was more frequently seen on Carlist monarchists fighting for Franco than on communist Republicans. Woolen field caps, such as the peaked *pasa montana*, were more popular with both sides in winter. Footwear was similarly nonstandard. In the summer, prewar-issue boots often gave way to lower-cut brogans or the cooler but flimsier *alpargato* sandals.

Among these two opposing armies, the interven-

Turning Points

Oct., 1936	First tank-versus-cavalry and tank-versus-tank engagements of the Spanish Civil War, near Esquivias, south of Madrid.
Mar., 1937	Destruction of a poorly supported Italian armored column by conventional Republican arms near Trijeque, northeast of Guadalajara.
Apr., 1937	The Condor Legion's air arm bombs Guernica, killing approximately 2,100 of the town's 8,000 inhabitants in arguably the first premeditated use of terror bombing.
Oct., 1937	Republican armored assault at Fuentes de Ebro fails because of poor coordination with infantry, artillery, and air support, contributing to the dismantling of the Soviet Army's independent armored formations on the eve of World War II.
Feb., 1938	In the first significant combat test of the tactic of dive-bombing, the Condor Legion's air arm attacks Republican positions near Teruel.

ing powers placed small numbers of up-to-date weapons and advisory groups to train Spanish clients in their use. Several hundred German 5.8-ton Pzkw I light tanks (but never more than 180 at a time) served on the Nationalist side, as did a similar number of the Italian 4.6-ton CV-33 tankettes. Both were thinly armored—the CV-33 had no turret or roof armor—and equipped with machine guns only. In crew protection and gun power the Soviet-supplied Republican tanks, the 9-ton T-26B and 11-ton BT-5, were far superior; both mounted 45-millimeter cannons. Low-wing fighter aircraft with retractable landing gear made their debut in Spain, but here the Soviet Polikarpov 1-16 was quickly outclassed by the German Messerschmitt Bf-109. Later variants of the Bf-109 and the Junkers Ju-87 Stuka dive-bomber would play prominent roles in Germany's early victories of World War II (1939-1945), as would the twin-engined Dornier Do-17 and Heinkel He-111 bombers, also introduced in Spain. However, these modern aircraft served side by side with more numerous biplanes of the previous generation and, like the tanks, in numbers too small to tip the strategic balance. Among the German antiaircraft contingent were four batteries of 88-millimeter guns, which proved equally effective in the direct-fire role against ground targets at Brunete (1937) and after. Unlike other weapons tested in Spain, the dual-purpose "88" neither became obsolete nor required significant improvement during World War II.

MILITARY ORGANIZATION

Both opponents in the Spanish Civil War were undersupplied and employed semi-independent militias, and neither had an effective centralized replacement system. For these reasons, standardized tables of organization and equipment were slow to take hold. During the first year of the war, for example, the all-communist Fifth Regiment grew into the Popular Army's V Corps. Other Republican units, notably the component battalions of the five International Brigades, shrank and consolidated as they sustained severe losses. Nationalist formations consolidated as well but more often retained prewar schemes of organization, which varied from Spain's Army of Africa to its Peninsular Army.

By 1938, the infantry division commanded by a coronel had become the basic building block of both armies, its strength fluctuating between 6,000 and 10,000 men. The Republican division usually comprised three Soviet-style mixed brigades, each of which was authorized as four battalions, but usually assigned three; a *grupo* of four artillery batteries; and an antitank battery. In some Nationalist divisions, the less standardized *agrupación* supplanted the brigade, and a single agrupación might include both African and Peninsular formations. Army of Africa formations included the *tabor*, a company-sized unit, and the *bandera*, two tabores supported by a heavy-weapons company. These sometimes served in the same divisions as Peninsular Army battalions. In both armies, a corps generally comprised three divisions, and an army, two or more corps.

DOCTRINE, STRATEGY, AND TACTICS

Historians who wrote during and immediately after World War II often regarded the Spanish Civil War as an ideal laboratory in which the Condor Legions, the military aid sent by Germany, could test the technologies and tactics of what later became known as Blitzkrieg, or "lightning war." Such a view supported contemporary efforts to explain the Allied failures from 1939 to 1941 and stemmed from a germ of truth: German advisers had indeed preferred to coordinate the movement of tanks with that of the other arms and, sometimes, to mass the mechanized elements in tactically independent formations. However, more recent scholarship indicates that, although often frustrated in their efforts, many Soviet advisers to the Popular Army had favored similar improvements.

Although Spain often proved a viable testing ground for prototypes of weapons later variants of which would see action in World War II, those prototypes were too few for reliable assessments of doctrine. Other factors compounded this deficiency. First, few Spanish commanders assigned doctrinal reform a high priority. Second, foreign luminaries who did, such as Germany's Heinz Guderian (1888-

Hulton Archive/Getty Images

Three tanks in battle during the Spanish Civil War, which proved a testing ground for the European forces that later fought World War II.

1954) and the Soviet Union's Mikhayl Nikolayevich Tukhachevsky (1893-1937), saw their nations' respective Spanish commitments as politically imposed burdens to be dealt with by subordinates. They preferred to conduct tactical experiments at home, away from prying eyes.

Guderian, the principal designer of Germany's tank forces, believed that tanks should attack in large, dense concentrations against narrow segments of the enemy's line. Unlike the Allied tank attacks of World War I, Guderian's attacks were to be accompanied by mechanized infantry and engineers and supported by dive-bombers rather than conventional towed artillery, which could not be expected to keep up. Once through the thick crust of forward defenses, the ground arms were to avoid dense concentrations of enemy troops where possible and spread out, making counterattack difficult. These densely packed Panzer spearheads were necessary not only to overcome enemy resistance but also to maintain the momentum of the advance even when some of the tanks suffered mechanical failure.

Wilhelm Ritter von Thoma (1891-1948), Guderian's proxy in Spain, faced not only prohibitive shortages of tanks and crews but also difficulty in training the Spanish. They were, in his words, "quick to learn but also quick to forget." Thoma also came to doubt that a battalion of tanks could be controlled by radios during the attack, and he urged Guderian, unsuccessfully, to have them removed. In the latter phases of the Ebro Counteroffensive (1938), Nationalist tank operations began to resemble Guderian's ideal, but previous Republican losses were largely to blame for that.

The Italians also experimented with mechanized forces, but the Italian *guerra celere*, "fast war," suffered even more from lack of training, leadership, and resources. At Guadalajara in March, 1937, a battalion of CV-33's was destroyed when it outran sup-

porting infantry and air cover. The subsequent Republican counterattack regained almost all of the lost territory, and all but a few Western observers interpreted the Italian failure as an indictment of all independent mechanized operations. Later Italian success in the Catalonia Offensive (1938-1939) drew far less commentary, as the Popular Army was then in its final stages of collapse.

The senior Soviet tank officer in Spain, Dmitri Pavlov (1897-1941), interpreted similar Republican failures as proof that the independent mechanized formations designed by Tukhachevsky in 1932 should be cannibalized and tied piecemeal to nonmechanized infantry. Tukhachevsky, like Guderian, believed that only tactically independent mechanized penetration could win land wars and, during 1936 and 1937, some of Pavlov's subordinates agreed. Two events settled the debate. The first was Tukhachevsky's trial and execution during the Purge of 1937, which rendered "Deep Battle" tank doctrine politically incorrect. The second was the failure of two Republican tank battalions to break through Nationalist defenses at Fuentes de Ebro on October 13, 1937. Although this defeat had been foreordained by poor planning and training, it nevertheless provided the ambitious Pavlov with more ammunition to use against a rival philosophy. His victory, and the consequent dismantling of Tukhachevsky's large formations, contributed to the Soviet defeat in 1941.

The relationship between Spanish Civil War air operations and doctrinal progress was also inconsistent. The most strategically significant use of aircraft—the airlifting of Nationalist forces from Spanish Morocco—made little impression on the Germans, for whom airlift capacity was to remain a third priority during World War II. Dive-bombing was indeed a higher priority, but the Germans had already committed to it by 1936, and only one Stuka ever appeared over Spain before January, 1938. Condor Legion fighter pilots, led by Werner Mölders (1913-1941), developed the "finger four" formation that they would use so effectively during World War II, whereas the bombers they escorted sometimes flew against civilian targets, as at Guernica (1937). Even so, the Luftwaffe never developed strategic bombardment or long range escort capabilities.

If Nationalist and Republican commanders had been more receptive to tactical innovation, a thoroughgoing doctrinal revolution would have been difficult anyway. Unlike the European battlefields of World War II, much of Spain was too mountainous for mechanized operations, and its road and rail networks were poor. Foreign instructors were few, and conducting hands-on training through translators was exceedingly difficult. On the Republican side, this lack of communication was especially problematic: In the first Soviet tank training detachment to arrive in October, 1936, only one man spoke Spanish.

CONTEMPORARY SOURCES

Ferdinand Miksche's *Attack: A Study of Blitzkrieg Tactics* (1942) argues that Spain was the perfect tactical laboratory for the intervening powers who would later fight World War II, and that the Allies failed to conduct the proper experiments or draw the correct conclusions when the Condor Legion did. More general accounts from the International Brigades are plentiful, but most mix political ideology with more strictly military matters. Arnold Vieth von Golssenau's *Der spanische Krieg* (1955; the Spanish War), written under the pseudonym Ludwig Renn, is among the best. English-language sources concentrate mainly on the Fifteenth Brigade, in which most of the American, British, and Canadian volunteers served. These include *Our Fight: Writings by Veterans of the Abraham Lincoln Brigade, Spain, 1936-1939* (1969), edited by Alvah Bessie and Albert Prago, and *English Captain* (1939) by Tom Wintringham. Spanish Republican accounts, even when useful, often mix polemics and tactics, as in the memoirs of rival communist commanders Juan Modesto, *Soy del Quinto Regimiento* (1969; I am of the Fifth Regiment) and Enrique Líster, *Nuestra Guerra* (1966; our war). Ramón Sender includes a revealing account of the first Republican tank operation in *Counter-attack in Spain* (1937), whereas Jose Miaja's chief of staff Vicente Rojo provides a view from Popular Army headquarters in *España heroica* (1942).

Fewer Nationalist sources have made it into English, but no study of the tank attack at Fuentes de Ebro can be complete without the interview related by Henry J. Reilly in the article "Tank Attack in Spain," published in the July/August, 1939, issue of *Cavalry Journal*. German frustrations in the area of doctrinal development are recounted by Gustav Diniker in his article "Betrachtungen über die Bewertung von Erfahrungen mit Kriegsmaterial in Spanien," in the June, 1937, issue of *Wissen und Wehr*.

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John Daley

World War II

United States, Britain, and France

Dates: 1939-1945

Political Considerations

At the end of World War I (1914-1918), there was no longer a balance of power in Europe. Britain and France had been physically devastated and were close to financial bankruptcy; Germany had been defeated and disarmed; Russia, by then the Soviet Union, had been excluded as a result of the Russian Revolution (1917-1921) and the spread of Communism. The United States had withdrawn from European affairs, devoting its attention to the Western Hemisphere and the Pacific and leaving Britain and France as the only real powers in an unstable political and military system. France decided to strengthen its border defenses, known as the Maginot line, using the Treaty of Versailles (1919) to prevent the rearmament of Germany and entering into a series of security alliances. Great Britain, perceiving no serious threat, returned to the advancement of its imperial interests, relying upon its navy for defense. Although both Britain and France belonged to the League of Nations created at the end of World War I, neither saw this organization as a credible deterrent to war.

With the exception of the persistent threat of Communism, the 1920's witnessed a lessening of international tensions, with the drafting of the Locarno Pact (1925), establishing Germany's western borders; the Kellogg-Briand Pact (1928), renouncing the use of war in settling international disputes; and the entrance of Germany into the League of Nations (1926).

Everything changed, however, after the U.S. stock market collapsed in 1929. Financial and economic crisis brought political instability and a renewal of international tensions. On January 30, 1933, Adolf Hitler (1889-1945) came to power in Germany. Italy began to assert its authority under Fascist dictator Benito Mussolini (1883-1945), and Fascism spread into Romania and Hungary, as the rest of Eastern Europe began to disintegrate. At the same time, Communist activities directed by Communist International (Comintern), the Communist organization founded by Vladimir Ilich Lenin (1870-1924), under the control of the Soviet Union increased. Governments were forced to direct all available resources to provide social services for the large numbers of unemployed and destitute.

International tensions escalated after Hitler began to rebuild German military power. In 1933, after the League of Nations refused to weaken the restrictions on German rearmament, Hitler's Germany left the organization. In 1935 the Saar was returned to Germany in response to a wave of Nationalist propaganda, and Hitler then attempted to take over Austria. Britain and France were able to thwart Hitler but only with the support of Mussolini, who allied with Hitler two years later when Britain and France refused to support his conquest of Ethiopia. In 1936 Hitler and Mussolini also sent aid to Nationalist general Francisco Franco (1892-1975) in Spain at the beginning of the Spanish Civil War, whereas the West relied on sanctions and weak protests. By 1936 Germany under Hitler and his National Socialist Party (Nazis) had begun to rearm at a frantic pace, whereas Britain, France, and the United States used almost all of their resources to bolster their economies. However, it should be noted that a considerable amount of the Works Progress Administration (WPA) spending in the United States was devoted to military purposes, including the building of two aircraft carriers and several military posts. Britain, in the meantime, had devoted a large portion of its 1936, 1937, and 1938 defense budgets to the building of radar stations and the infrastructure of an early warning system.

In 1936 military-age Germans outnumbered their French counterparts two to one. France, the key to Allied defense against Nazi aggression, realized that it would be unable to match either German manpower or German industrial production. For a short time, the French government actively sought an alliance with the Soviet Union, but this alliance never materialized, due to the purges of Joseph Stalin (1879-1953) in the late 1930's. Increasingly forced to rely on a defensive strategy, France became more obviously weak, taking no action when Hitler remilitarized the Rhineland in 1937.

Meanwhile, Britain had decided that some kind of accommodation or appeasement could be reached with Hitler, offering only perfunctory protests when Hitler remilitarized the Rhineland and carried out his Anschluss, or annexation, of Austria in early 1938. When Hitler demanded that something be done about Czechoslovakia, the British, with French acquiescence, decided to appease Nazi Germany rather than risk a war they were not prepared to fight. In September, 1938, the British and French leaders, Neville Chamberlain (1869-1940) and Édouard Daladier (1884-1970), allowed Hitler to seize the Sudetenland, which included most of Czechoslovakia's defenses and armament industries, in return for Hitler's promise that he would meet with them to negotiate future problems. In March, 1939, Hitler violated the agreement and seized the rest of Czechoslovakia.

Neither France nor Britain had begun to rearm seriously until the crisis over the Sudetenland, and they thus negotiated from a position of weakness. For example, all of the aircraft used by Britain to fight the Battle of Britain (1940) were manufactured after the Czech crisis. Although both France and Britain had begun to rebuild their military forces in early 1939, their action was too little, too late. When the Polish crisis escalated into war with the Nazi invasion of Poland on September 1, 1939, neither France nor Britain was prepared to fight. In actuality, the military weakness of Britain and France encouraged Nazi aggression and added to the crises that led to World War II.

The United States was even further behind its European allies in military development. Preoccupied with the efforts to deal with the Great Depression and perceiving no immediate external threat to national security, the U.S. Army was less prepared to wage war than it had been in any time since the American Civil War (1861-1865). Ranked equally with Britain and Japan in naval power, in 1939 the United States was ranked seventeenth in overall military strength, behind both Spain and Romania. The U.S. armed forces had no tanks, few first-line fighter aircraft, and barely enough rifles for its army.

It should be remembered that the United States, disillusioned by the outcome of World War I, was determined to stay out of World War II. However, as British and French power in the Pacific diminished as

Turning Points

Sept. 1, 1939	Germany invades Poland, leading to British declaration of war.
Mar., 1940	Lend-Lease Act in the United States establishes the principle of providing military aid to Great Britain.
Aug., 1940	Germans begin the Battle of Britain, a series of air raids over Britain aimed at destroying British infrastructure and morale.
Dec., 1941	The United States enters World War II after the Japanese bombing of the U.S. Navy fleet at Pearl Harbor, Hawaii.
Nov., 1942	Anglo-American force invades French North Africa.
June 6, 1944	Allies begin invasion of Normandy, France, on "D day," marking the largest amphibious operation in history and the beginning of Allied victory in Europe.
Aug. 6, 1945	The first atomic bomb to be used against a civilian population is dropped by the United States on the Japanese city of Hiroshima, killing more than 70,000 people and hastening the end of the war.

Digital Stock

Smoke looms on the horizon after the first mass air raid on London during World War II.

a result of the fighting in Europe, the Japanese began to seize the opportunity to expand their influence in the region. Although the U.S. armed forces were in a weakened state, U.S. interests in the Pacific, mainly in China and the Philippines, had to be protected. A series of crises, misunderstandings, and miscalculations on both sides resulted in the Japanese decision to attack the United States Pacific Fleet at Pearl Harbor, Hawaii, on December 7, 1941. Unprepared, the United States suddenly found itself involved in World War II.

MILITARY ACHIEVEMENT

The military role of France during World War II was limited by its early defeat and surrender in 1940. Hampered both by its reliance on the fixed fortifications of the Maginot line and by its refusal to create a modern armored force, the French army was neither doctrinally nor technically capable of defeating the Germans. Later in the war, however, the First French Army, equipped and supplied by the United States and commanded by General Jean-Marie-Gabriel de Lattre de Tassigny (1889-1952), performed well and helped to liberate France.

The British army did no better than the French. Defeated on the frontier of France in 1940, it was forced to retreat to Dunkirk and had to be evacuated, leaving behind all of its heavy equipment. Only in the initial battles against the Italians in North Africa did the British army emerge victorious. The Royal Air Force did perform better: With their Spitfire and Hurricane fighters, both guided by sophisticated early-warning radar systems, they were able to defeat the German air force, or Luftwaffe, and prevent the inva-

sion of Britain. At the same time the heavy bomber force under British air marshal Arthur T. Harris (1892-1984), after concluding that daylight bombing would be too costly, began the successful development of night bombing operations. Harris developed the concept of "saturation bombing"; in May, 1942, he attacked Cologne with 1,000 planes and destroyed 600 acres of the city. However, high losses of 970 bombers between May and November, 1942, hampered his efforts.

British military performance, even when supported by a large infusion of U.S. aid, improved little in the desert battles against German commander Erwin Rommel's (1891-1944) Afrika Korps. Problems with command and control, armor, and leadership led to numerous British defeats. At the same time, the British army in the Far East was outfought and outmaneuvered by the Japanese, resulting in one of the worst defeats in British history, at Singapore (1941-1942). The situation did begin to improve when British generals Harold Alexander (1891-1969) and Bernard Law Montgomery (1887-1976) reorganized the British Eighth Army and won the Battle of El Alamein (1942). At the same time the British army came increasingly under U.S. control, both logistically and tactically.

Although the United States had not been prepared to fight a war when the Japanese attacked Pearl Harbor, the nation quickly mobilized its vast resources and was able to launch offenses in both North Africa and the South Pacific within less than a year. Although its initial performance was unimpressive, the U.S. Army was victorious at the Battles of the Kasserine Pass (1943) and New Guinea (1943). Three factors played a major role in early U.S. victories: material superiority, command of the air, and adaptability to changing circumstances.

Due in large measure to the training provided by the government and armed forces service schools, senior officers were intellectually prepared for a global war. The logistical accomplishments of the army and navy were formidable. Despite initial problems and some brief shortages of critical supplies, the U.S. servicemen and their allies were amply supplied with everything they needed to fight the war. Another area of exceptional performance was the U.S. artillery, which used forward observers and new operational techniques. The U.S. artillery proved to be the most successful arm of the service, a fact repeatedly remarked upon by captured German soldiers.

The U.S. Army excelled in two other aspects of warfare: air and amphibious operations. In the air, using heavy bombers such as B-17's and B-24's, the U.S. Army Air Corps was able to destroy much of Nazi Germany's infrastructure, making it very difficult to maintain production. In the Pacific the B-29's were even more successful in destroying Japanese industrial production. Although strategic bombing did not win the war, as some prewar theorists had predicted, it did play a significant role in the defeat of the Axis Powers. Amphibious operations were very difficult, and much of the necessary equipment had to be developed during the war. Thanks to U.S. engineer-

NARA

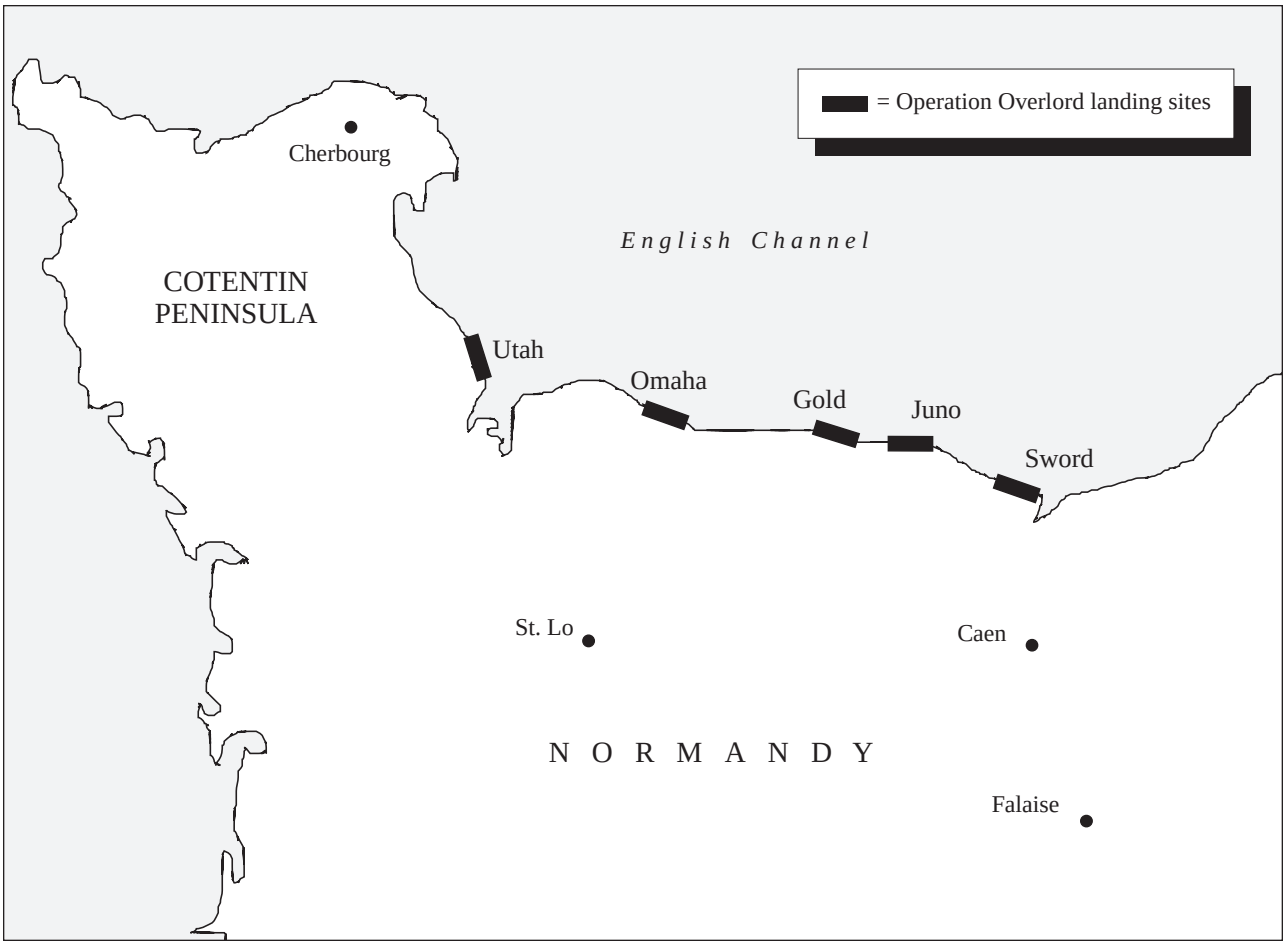
An F6F-3 Hellcat crash-lands onto the USS Enterprise *in November, 1943. Lieutenant Walter L. Chewning, Jr., climbed up the aircraft to assist the pilot to a successful escape.*

ing and production genius, the United States was able to carry out successful landings on hostile beaches in both the European and Pacific theaters of operation. The most important amphibious operations were the landings during Operation Overlord on Normandy beaches launched on June 6, 1944 (D day), which marked the start of the final campaign of World War II.

British and American intelligence was able to break the German and Japanese codes during the war, thereby gaining advanced warning of enemy intentions. At Bletchley Park, 50 miles north of London, Britain assembled a large group of cryptologists, who successfully decrypted the German codes throughout the war, providing real-time intelligence to the commanders in the field. The Allied intelligence system was code-named Ultra, and its existence was not revealed until almost twenty years after the war ended. At the same time, U.S. cryptologists broke the Japanese codes. Despite this success, however, the United States was surprised by the Japanese attack on Pearl Harbor, and reliance upon the Ultra codes contributed to the failure of U.S. intelligence to realize the seriousness of the German attack in December, 1944, that resulted in the Battle of the Bulge (1944-1945).

Perhaps the greatest military achievement during World War II was the development and use of the atomic bomb by the United States. Rarely has a single weapon so changed the nature of warfare and the

NORMANDY INVASION, 1944



global balance of power. The decision to drop the atomic bomb, though controversial, hastened the end of the war.

U.S. Army

General Dwight D. Eisenhower briefs paratroopers in preparation for the D-day invasion.

Weapons, Uniforms, and Armor

World War II witnessed the development and deployment of a large number of weapons ranging from the M1 Garand rifle to the atomic bomb. Science and technology played a greater role in the operational aspects of World War II than in those of any other war in history. In fact, a whole new area of military operations, called operational analysis, developed from the application of science to military problems. Operational analysis dealt with everything from the best depth at which to set depth charges to the most efficient force structure for combat divisions.

During the 1920's and 1930's the British experimented with a wide variety of armored vehicles, as well as other weapons systems. However, due to a lack of funding and a perceived lack of a serious military threat, these experiments were carried no further. The British went to war in 1939 with an army that was essentially equipped with slightly upgraded World War I weapons, except for the Spitfire and Hurricane fighters and some heavy bombers, which were developed late in the war. This failure in military modernization resulted in an increasing reliance throughout the war upon U.S. weapons, especially tanks and armored vehicles. After its defeat in 1940, the reconstituted French army that fought alongside the Allies in 1944 and 1945 relied almost entirely upon American weapons.

Within a year after the United States' entry into the war, the country had become the "Arsenal of Democracy," providing weaponry and supplies for all of the Allies, including the Soviet Union. At the same time, it equipped the ninety-division U.S. Army with excellent weapons. The standard infantry weapon was the M1 Garand, which was a gas-operated, clip-fed, semiautomatic rifle that fired eight shots and weighed 9.5 pounds. The artillery, especially the 105-millimeter howitzer and the 155-millimeter gun, used the fire-control system developed early in the war and proved to be the most effective arm of the army.

In the air, the U.S. heavy bombers (B-17's, B-24's, and B-29's) and fighters (P-47's and P-51's) were dependable and proved capable of defeating their adversaries. One of the less well known technical triumphs of American ingenuity was the proximity (V.T.) fuse. Actually a small radar set built into an explosive shell, it was so effective that no one was allowed to fire it over land, for fear the enemy might get their hands on one that did not explode. The greatest success of American technology was the atomic bomb, which hastened the end of the war against Japan and revolutionized warfare.

The greatest failure of American weaponry was the M4 Sherman medium tank. Although the reliable Sherman tank was capable of performing most of the

tasks assigned to it, it had not been designed to be an antitank weapon and failed when called upon to engage the German medium or heavy tanks known as Panthers and Tigers. Produced in large numbers, more than 40,000, it provided armor not only for the U.S. Army but also for the British, French, and Polish forces in Europe. The M26 Pershing, which was designed to fight other tanks, was introduced at the end of the war but arrived too late to have any real effect. Only 700 Pershings were shipped to Europe.

MILITARY ORGANIZATION

At the beginning of World War II, the British Expeditionary Force (BEF) was dispatched to France. While retaining its independence, it served under the French commander General Maurice-Gustave Gamelin (1872-1958) and later General Maxime Weygand (1867-1965). Organized into two army groups, the French concentrated the bulk of their mobile forces in the north with the BEF. After the defeat of France and the evacuation of the BEF from Dunkirk, most of the French army became a home-defense force. The remainder, along with Commonwealth forces, were sent to North Africa, whereas the British army stationed in India under separate command was used to reinforce the defenses in the Near East and Asia.

After the United States entered the war, the British army, although more experienced, came under U.S. field command. At the highest levels, the military command structure was the Combined Chiefs of Staff, consisting of the U.S. Joint Chiefs of Staff and the British Imperial General Staff. Although the Combined Chiefs of Staff operated on the principle of unanimity, the United States was decidedly the dominant partner. The staffs of both countries became more elaborate as the war progressed. The U.S. Joint Chiefs of Staff became increasingly involved in the formulation of U.S. foreign policy during the war. When the North African campaign began, the Free French were brought in as a junior partner. However, this relationship remained tenuous throughout the war because of President Franklin D. Roosevelt's (1882-1945) personal distrust of the French leader, General Charles de Gaulle (1890-1970). Although the Soviet Union was an ally, it was seldom involved in military decisions at the strategic or tactical level.

The war was fought by the Allies—mainly the United States, Britain, and France—in four theaters of operation. The European theater was commanded by U.S. general Dwight D. Eisenhower (1890-1969), who had taken direct control over the cross-Channel invasion, prompting Field Marshal Alexander to take control of the Italian campaign. In the Pacific theater, the Southeast Pacific was commanded by General Douglas MacArthur (1880-1964), the Central Pacific by Admiral Chester W. Nimitz (1885-1966), and the China-Burma-India theater by Admiral Louis Mountbatten (1900-1979). For a brief period during the Guadalcanal campaign in the Solomon Islands, there was a further division called the South Pacific theater, commanded by Admiral William F. Halsey (1882-1959). In all of these commands there were joint staffs of U.S., British, and other Allied officers. The Americans were in command and provided most of the forces who fought in all theaters, except the China-Burma-India theater. One major difference in operations should be noted: in the European theater of operation, Commonwealth—mainly Canadian—troops remained as part of the British command, whereas in the Southwest theater of operations, the Australian army served directly under MacArthur.

The reconstituted French army served not as a separate force but rather as one of the armies under U.S. command. One of the primary reasons for this arrangement was U.S. responsibility for logistical support. At the end of the war, the First French Army was separated and given its own sector of Germany to occupy.

Cooperation between the Western Allies and the Soviet Union was difficult at best. At the beginning of the war, due to British resistance to an early cross-Channel invasion, U.S. staff officers had been more favorable to the Soviet Union. However, as the war progressed and Soviet intentions in Eastern Europe became apparent, the U.S. Joint Chiefs of Staff became increasingly hostile to the Soviets. The resulting mutual suspicion contributed to the beginning of the Cold War.

Doctrine, Strategy, and Tactics

A nation's military doctrine generally determines the nature of its weapons development, strategy, and tactics. During the years immediately following World War I, all of the major powers reevaluated their military in light of the lessons learned in that war. The French came to the conclusion that defensive fortifications such as Verdun were their best option along with an infantry force supported by artillery and some armor. They believed that such a force would be able to take the offensive only in a limited way, using armor basically as mobile artillery to support the infantry rather than as an independent force capable of disrupting the enemy's lines.

Britain experimented with a variety of armor operations during the interwar years. For example, General Sir Percy Hobart conducted deep penetration armor maneuvers in 1935. However, the lack of adequate funding and the absence of a clear threat limited any deployment to small units more suitable for use as an empire constabulary rather than a continental army.

American planners such as Colonel George S. Patton did conceive of the use of large armored formations but the absence of any real threat, the financial restraints created by the Great Depression and the conviction that the United States would not be involved in a European war in the future resulted in inadequately trained and equipped forces. The army

Naval Historical Center/USCG Collection

Omaha Beach, June, 1944, in the early days of Operation Overlord following the D-day invasion.

and many planning staff did develop very extensive plans (the Rainbow Plans) and realized many of the possible difficulties that were found later in the war. For example, under the leadership of Major Earl H. Ellis (USMC), doctrine and planning for amphibious warfare were developed prior to the war.

By not entering the war until December of 1941, American planners were able to take advantage of the experience of both the Allies and the Germans. The decision to create only a ninety-division army hampered some operations, especially the large-scale armor attacks favored by the Germans and the Russians. Much of American doctrinal development during the war centered on the use of the vast material advantage that the United States possessed, especially in artillery and airpower.

In the area of airborne operations, the U.S. Army developed the doctrine, organization, equipment, and tactics during the early part of the war. After basing much of their development on reports of German successes in 1939 and 1940, the U.S. airborne units and their British counterparts proved to be some of the most effective fighting forces in the European theater of operations, despite their limited use. The 82nd and 101st Airborne Divisions were considered two of the best.

From the beginning of U.S. involvement in the war, the Allied strategy was "Europe first." Although unable to launch a cross-Channel invasion in 1942, the Allies attacked Germany first in North Africa (Operation Torch) and then in Sicily (Operation Huskey). At the same time priority was given to the heavy bomber offensive against Germany.

After the successful landings at Normandy, Allied strategy in Europe was a broad-front strategy. Rather than concentrate on one or two major thrusts, as the British commander Field Marshal Montgomery advocated, Eisenhower opted to attack along the entire front, forcing the German army to retreat back into Germany and ultimately destroying its ability to fight. Probably the greatest failure of American strategy was Eisenhower's decision to stop his advance at the Elbe River, allowing the Soviets to take Berlin and consequently to occupy all of Eastern Europe.

In the Pacific, General MacArthur directed an island-hopping strategy that avoided Japanese strong points. At the same time the Japanese were further stretched by the U.S. decision to shift the axis of their attacks along two fronts: the Southwest Pacific from New Guinea through the Philippines and the Central Pacific. The Japanese surrendered before they were actually invaded.

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Discussion of the role of armor and airpower dominated writing about military theory both before and during World War II. French military thinking was dominated by the French World War I experience, as seen in the *Provisional Instructions Concerning the Tactical Utilization of Larger Units* drawn up in 1921 and revised in 1936, which stressed firepower, the power of fortifications, and the need to increase the offensive power of the infantry. Colonel Charles de Gaulle was one of the few officers who disagreed. In his books *Vers l'armée de métier* (1934; *The Army of the Future*, 1940) and *Fil de l'épée* (1932; *The Edge of the Sword*, 1960), he described many of the elements of the modern armored division and suggested that France organize a large armored force to protect its northern front.

Two British theorists also were important in the development of armor doctrine: Major General J. F. C. Fuller (1878-1966) and Captain Basil Liddell Hart (1895-1970). In his books *The Foundations of the Science of War* (1926), *On Future Warfare* (1928), and *The Army in My Time* (1935), Fuller criticized British military doctrine and advocated a force structure that relied heavily on armor and airpower. Liddell Hart's works *The British Way in Warfare* (1932) and *Thoughts on War* (1944) provided the most insightful and influential studies on military doctrine of the period. Liddell Hart probably had a greater impact on German than British military history. Although George S. Patton (1885-1945) and other American officers had written numerous articles in service journals about the future of armor, they had little impact until the war.

No one made greater claims than the air theorists. Air marshalls Hugh Trenchard (1873-1956) and Arthur T. Harris believed that strategic bombing could defeat the enemy and win the war without the huge loss of life that would result from a land campaign. Although they did not write any books, their views were widely known through interviews and news articles. The most influential books written during the period included those of Sir John Slessor (born 1897), *Air Power and Armies* (1936), and J. M. Spaight (born 1877), *Air Power and the Cities* (1930), *Air Power in the Next War* (1938), and *Bombing Vindicated* (1944). Liddell Hart was more balanced in his view of the importance of airpower in his book, *When Britain Goes to War* (1935). Two American officers, Lieutenant General Henry Harley "Hap" Arnold (1886-1950) and Brigadier General Ira C. Eaker (1896-1987) wrote three books dealing with airpower, which were designed to encourage public support for the expansion of the air force: *This Flying Game* (1936), *Winged Warfare* (1941), and *Army Flyer* (1942).

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Jachin W. Thacker

World War II
The Soviet Union
Dates: 1939-1945

Political Considerations

When the Germans invaded the Soviet Union on June 22, 1941, they turned what had been a relatively localized readjustment of the balance of power in Europe into a continent-wide total war. Despite the mythology that surrounds events such as the fall of France in May and June, 1940, and the landings at Normandy on June 6, 1944 (D day), the European theater in which World War II was fought and won (by the Allies) was on the eastern front. The majority of Germany's resources—men, tanks, airplanes, and other weapons—were committed there; the great preponderance of the casualties were suffered there; and it was there that the Soviet Union first retreated, then held, and then finally pushed back the German advance. The Soviets ultimately succeeded through a combination of sheer numbers, implacable stubbornness, and a series of war-winning weapons and strategies that the Germans could match only belatedly and incompletely.

The Soviet experience had, in essence, two overall phases. In the first, the Soviets desperately tried to overhaul and re-create the organization, equipment, and doctrine of their military, while at the same time attempting to prevent an utter rout by the Germans. The second came as the Soviets succeeded at that gargantuan task and created a military with the soldiers, training, and ability to defeat the Germans. That accomplishment, possibly more than any other, ensured Germany's defeat in World War II.

The political context of the Soviet Union during World War II centered on the regime of Communist dictator Joseph Stalin (1879-1953). Stalin had decimated the officer corps of the Red Army before the war, seeking to eliminate threats to his control. Because of Stalin's purges, the army that fought the Germans was led to a large extent by officers who were learning on the job. Stalin's usually paranoid nature deserted him in 1941, when he refused to believe numerous internal and external warnings of the impending German attack. As a result, on June 22, Operation Barbarossa, the German attack on the Soviet Union, achieved strategic surprise. The initial attacks quickly cut through and rapidly encircled Soviet forces that had been deployed on orders from Stalin, on the Soviet frontiers. The result was disastrous. Within two months, hundreds of thousands of Soviet soldiers were captured, and the Soviet military was decimated. It would not recover the initiative until 1943.

Stalin did not deal well with the outbreak of war. The invasion itself threw him into a state of shock. He did not make a radio broadcast to the nation until July 3, 1941, and remained largely out of sight after that. As the Germans advanced steadily into the Soviet Union, he grew more and more frantic, worrying as much about his loss of power as the loss of Soviet land. When the Germans reached the outskirts of Moscow, Stalin was close to a nervous breakdown.

Stalin's anxiety created a temporary and partial vacuum at the top of the Soviet hierarchy, but it also had two beneficial effects. First, it allowed senior army officers, such as Marshal Semyon Konstantinovich Timoshenko (1895-1970) and Marshal Georgy Konstantinovich Zhukov (1896-1974), to put their stamp on a reorganization and revitalization of the Soviet army. Second, it forced Stalin and his commissars to turn from the Communist Party toward Russian nationalism as the center of Russian loyalty. Within weeks after the German invasion, messages from the Kremlin began to emphasize the Russian motherland rather than the Communist Party. This appeal to nationalism revitalized the Russian popula-

TURNING POINTS

Aug. 31, 1939	The Soviet Union and Germany sign a mutual nonaggression pact.
June, 1941	The Germans begin Operation Barbarossa, their invasion of Russia.
Aug., 1942-Jan., 1943	The Russians withstand the German Siege of Stalingrad, marking the ultimate German failure on the Russian front.
July, 1943	The Russians defeat the Germans at the Battle of Kursk, one of the largest tank battles in history.
Apr.-May, 1945	The Russians wage air, artillery, and tank attacks in the Battle for Berlin, at which the Germans ultimately surrender, ending the war.

tion in a way that an appeal to the Communist Party, stained by years of purges and violence, probably never could have.

Stalin recovered his nerve after winter brought the German offensive to a halt. For the next two years, however, he was politically pinned by the success of the Germans. He had to allow his generals their lead, in the hope that they would be able to prevent the conquest of the Soviet Union. This openness could be seen most clearly in early 1943, when Stalin reluctantly accepted the recommendation of his generals to stay on the strategic defensive until late in the summer.

The political atmosphere changed significantly in late 1943 and early 1944. When it became clear that the Soviets would be able to push the Germans out of Russia, Stalin began reasserting his authority over the Soviet system. He took direct control of the final Soviet offensive into Poland and Germany in January, 1945, effectively undercutting the power of Zhukov, his most successful general.

In addition, Stalin began thinking about the shape of the postwar world. His primary goal was to ensure that the Soviet Union had a military buffer around it of states controlled or influenced by the Kremlin. This strategy had military effects most obviously in Poland, where from August through October, 1944, Stalin halted the forward advance of the Soviet army to allow the Germans time to deal with an uprising of the Polish resistance in Warsaw. He had his own Polish government ready in Moscow and eagerly took the chance to eliminate any rivals to it.

By the end of the war, Stalin's paranoia had again reached epidemic proportions. He saw, in everything, a threat to his rule. Perhaps the two most endangered groups at this point were returning prisoners of war, who were likely to be executed or shipped to Siberia because of their supposed contamination by Nazi ideals, and successful generals, whom Stalin believed posed a political threat to him. Stalin's personal paranoia echoed a national paranoia that feared another invasion. Both of these paranoias contributed strongly to the start of the Cold War.

MILITARY ACHIEVEMENT

The Soviet military achievement was simple. The Soviet army absorbed the greatest weight of the German assault and turned it back. This was more than simply a victory over a particular nation. It was also a victory over a particular kind of warfare. The German Blitzkrieg, or "lightning war," methods had seemed unbeatable, first in Poland in September and October, 1939, and then in France in May and June, 1940. In both cases, the German Panzer armies had swept past and through their opponents, destroying them within weeks at relatively minimal cost.

German invincibility had seemed to continue in the first six months of the invasion of Russia. The Russians managed, through their doctrinal reorganizations, their employment of land and space, and their studied use of the winter conditions, to shatter the spearheads of the German offensives and turn them back.

The prime example of this achievement was at Kursk in 1943, when the Germans attacked a salient, or defensive fortification, in the middle of the Russian lines. Because the Germans' choice of target was obvious, the Soviets had time to build up an enor-

mous set of fortified defensive lines backed by mobile armored forces. The defensive lines absorbed and bled the German armored spearheads, and the armored forces mounted a series of punishing counterassaults. The result, as it would be for the last two years of the war, was a decisive victory for the Russians and a costly loss for the Germans.

Weapons, Uniforms, and Armor

Soviet weapons tended to be simple but also reliable. They had to be easily manufactured in relatively primitive factories by workers with minimal skills. They had to function in conditions that ranged from the appalling heat of the southern summer to the bitter cold of the northern winter. The results were, for the most part, ruggedly designed and built weapons that could absorb an enormous amount of punishment, both military and environmental, and keep on going. This held true for weapons ranging from the smallest to the largest. Soviet infantry weapons, such as the crude but effective PPSh41 submachine gun, were hard-wearing and reliable. The 11-2 Sturmovik ground-attack plane could take enormous punishment and return to base.

Oddly, the Soviets nonetheless managed to produce some weapons that not only were reliable and hard-wearing, but also surpassed those of the Germans in technological and military effectiveness. The T-34 tank is the classic example. Its sloped armor shrugged off German shells; its high-velocity 76-millimeter (later 85-millimeter) gun could easily destroy any of the then-operational German tanks; and its wide treads allowed it to drive easily over most mud and snow. With its powerful but reliable diesel engine, the T-34 outclassed anything the Germans put in the field in 1941 and 1942. The later German supertanks—the Panther and the Tiger—were, for the most part, desperate reactions to the T-34.

Military Organization

In the initial stages of World War II, Soviet military organization was both ineffective and confused. The largest unit in the army was the corps, consisting of nearly 40,000 men and, supposedly, nearly 1,000 tanks. Few of these corps were up to strength, and their units tended to be dispersed widely and, worse, to answer to different regional headquarters. The Soviets thus had neither the large-scale forces needed for a war of maneuver nor the central organization to use the forces they had effectively.

The near-destruction of the military in the initial months of the war led to its drastic and fundamental reorganization, done on the fly and even as Soviet forces were being forced back to Moscow. The military was commanded from the top by the Stavka, a group that encompassed both the Supreme High Command, led by Stalin, and the General Staff of officers, who advised the Command.

At first, there were three Main Commands, each of which controlled several fronts, responsible to the Stavka. Stalin and his generals made such a habit of bypassing the Main Command commanders that this tier was soon abolished, and the front commanders became the next organizational level for the rest of the war. These fronts were centered on geographic areas, such as Leningrad, the trans-Caucasus, or Moscow. Each front headquarters controlled all the military forces within that area, armored, air, or infantry. Such headquarters often found themselves barely able to control such an enormous responsibility, and as the war continued, the Soviets increased the number of fronts.

Very quickly, the Stavka abolished the corps and replaced it with a smaller field army. It did so because of both the shortage of equipment, especially tanks, and the lack of experienced midlevel officers.

Along with this reorganization came renewed power for the political commissars who controlled the army on behalf of the Communist Party. Commissars were present at every level of command. It was not until late 1942 that the commissars lost much of their power, as Stalin reined them in to reduce any threat to his personal power.

Below the front level, Soviet organization in the first months was chaotic, broken up by the rapid retreat. Beginning in 1942, however, the Stavka began to build up mobile mechanized units, in somewhat of a return to the prewar deep-penetration ideas.

WORLD WAR II: THE EUROPEAN THEATER

The first units were tank corps, which had about 8,000 men and 100 to 200 tanks. Larger units were soon created, which eventually became tank armies in 1943. These were made up of several tank corps and supporting units. The purpose of these highly mobile tank armies was to exploit gaps in the German defenses created by rifle infantry units. The tank armies proved highly successful and fought their way to the gates of Berlin.

DOCTRINE, STRATEGY, AND TACTICS

Soviet grand strategy shifted as the war went on. Prior to the war, the official Soviet doctrine, as laid out by people such as Marshal Mikhayl Nikolayevich Tukhachevsky (1893-1937) in the 1920's and 1930's, emphasized the idea of offensive deep penetrations led by mechanized units, aimed at breaking through the World War I static defenses and exploit-

ing the gaps before the enemy gathered itself. The strategy was similar to German conceptions and was driven by geography as well as technology. The immense distances and relatively flat terrain of western Russia meant that campaigns rarely remained static. Such strategy relied, however, on an experienced and able senior officer corps, the very group that had suffered calamitously in Stalin's purges.

Thus in the early months of World War II, the prewar doctrine was essentially thrown out the window, and grand strategy centered on the defensive, as the country struggled to survive. The Soviets remade their doctrine on the fly, bowing to the dictates of necessity. In the first year of the war, the holding of critical centers such as Leningrad and Stalingrad was the key.

As the tide shifted, the Soviet leadership began to look to a series of massive counteroffensives that built upon one another to sweep them back through their lost territory and into Germany. The 1942 fall offensives, which included a pincer movement on the German forces at Stalingrad and a major assault on the German army group facing Moscow, were perceived as the foundation for a wave of attacks that would end the war.

Although the Stalingrad Offensive (1942-1943) was an enormous success, the German defenses tightened afterward, and the exhausted and worn-down Soviet forces needed time to rebuild. Stalin and the Stavka had to accept reluctantly that the war could not be won quickly. They thus turned to the idea of local attacks, which would both push back and bleed the German forces, interspersed with periods during which both sides rebuilt their forces.

This was the pattern the Soviets followed after their victory at Kursk. Thus, from December, 1943, through April, 1944, Soviet armies in the south pushed back the German forces in the Ukraine, while attacks in the north finally freed Leningrad after three years of encirclement. Once those offensives had met with success, the Soviets paused and built their forces up in the center, eventually attacking the Germans in front of Minsk in June, 1944. The near-continuous assaults and the shifting of theaters wrong-footed and wore down the German defenders. It allowed the Soviets to pick their targets and build up forces as required.

Soviet operational strategy was based on gathering overwhelming numbers and firepower at the point of decision, whether in attack or defense, and using it to overcome the Germans. Once the infantry and artillery had created a break, mobile mechanized forces came up to exploit the gap, surge far into the German rear, and cut off the Wehrmacht forces. That was the theory, anyway. In execution, Soviet commanders often committed their mobile reserves too early and allowed them to be destroyed by the German defenders. This occurred as late as April and May, 1945, when Zhukov put in his armored forces too early during the Battle of Berlin, causing them to be entangled not only by the German defenders but also by the logistical tails of their own infantry. For the greater part, however, the Soviets found immense success with this strategy, successfully cutting off the German army led by Friedrich Paulus (1890-1957) outside Stalingrad in the winter of 1943, and then, in

Hulton Archive/Getty Images

Russians race to take up a new position near Stalingrad.

June through August, 1944, sending the German Army Group Center on a retreat from the Ukraine and killing or capturing more than 400,000 Wehrmacht soldiers in the process.

Two external factors aided the Russian strategy. The first was Adolf Hitler's obsessive refusal to allow his commanders to retreat to more defensible positions. His "stand-fast" orders, as at Stalingrad, played right into the Soviet strategy by setting Wehrmacht units up to be encircled. Second, Dodge trucks provided through the U.S. Lend-Lease program formed the Soviet logistical spine and kept the armored spearheads resupplied and refueled.

Soviet tactics relied on infantry-armor combinations, backed up by overwhelming fire support from both artillery and ground attack aircraft. A typical assault in 1944 or 1945 began with reconnaissance battalions infiltrating the German defensive lines to seize key points. As this was occurring, artillery and air units would pound the Germans to soften them up for the assault. After the initial phase, the bombardment would shift to targets in the rear, allowing an assault on the German lines by infantry, heavy armor, and combat engineers. Finally, combined-arms groups would follow up and take advantage of newly made gaps to begin encircling the German forces.

The cost of this strategy was enormous. Estimates of Soviet military casualties ranged from twenty to forty million soldiers. Civilian casualties may have been higher. Overall it was estimated that the Soviet Union lost up to twenty eight million dead. In addition to the human cost, the western half of the Soviet Union was dealt an enormous economic and social blow. Millions of people were made refugees, and the industrial infrastructure was either destroyed, captured, or uprooted. For the second time in the century, European Russia had borne the brunt of total war. It was an experience the Russians wished never to repeat, and, more than anything, this desire would inform their postwar behavior.

When the Soviet army rolled into Berlin in May, 1945, it was perhaps the most powerful army the world had ever seen. It had successfully learned from the disasters of 1941 and 1942 and applied the harsh lessons of total war to its doctrine, organization, and technology. It had rebuilt itself, even while fending off the Wehrmacht deep in the Russian steppes. It had done so at immense cost in the lives of both soldiers and civilians, but it had done so victoriously. Perhaps the only military to undergo a similarly triumphant transformation was the United States Navy during the Pacific war against Japan from 1941 to 1945. In essence, the Soviet military, supported by the iron will of the Russian people, had ended the Nazi threat. Rightly, their performance in the "Great Patriotic War" was viewed with pride.

CONTEMPORARY SOURCES

A vast array of material has been published in Russia on World War II, but little of it has been translated into English, the major exceptions being Vasili I. Chuikov's *The End of the Third Reich* (1967) and *The Memoirs of Marshal Zhukov* (1971). As a result, most of the available sources for the eastern front in World War II have tended to lean heavily toward the German point of view. During the Cold War, access to Soviet documents was limited, but that changed in the 1990's. The collapse of the Soviet Union made thousands of pages of documents and other contemporary sources available. Although this access has remained restricted and the Russian Federation's "processing" has often affected the content of available material, the change in attitude has been remarkable. The new sources have allowed a flowering in studies of the Soviet experience during World War II, led by such scholars as David Glantz. Harold Orenstein's *The Evolution of Soviet Operational Art, 1927-1991: The Documentary Basis* (1995) is probably the best English-language account of the important Soviet documents. Simon Sebag-Montefiore's *Stalin: The Court of the Red Tsar* (2003), was based on hitherto unprecedented access to Stalin's own records. There have also been many accounts, previously available only in Russian, that have been translated into English or German, such as D. F.

Loza's *Commanding the Red Army's Sherman Tanks* (1996) and his *Fighting for the Soviet Motherland* (1998) as well as Gabriel Temkin's *My Just War: The Memoir of a Jewish Red Army Soldier in World War II* (1998).

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David Silbey

World War II
Germany and Italy
Dates: 1933-1945

Political Considerations

In the years between 1918 and 1933, German armed forces assumed a political posture fundamentally hostile to the young Weimar Republic created at the end of World War I, blaming that state for Germany's humiliating defeat in the war, for its enduring political turmoil and economic problems, and for the perceived fraying of its social fabric. For more than a decade after the end of World War I, the German military tried to circumvent the constraints imposed upon it by the Treaty of Versailles (1919). With that treaty, the victorious Allies had abolished German conscription, limited the size of the German army to 100,000 men (including 5,000 officers) obligated to 12-year terms of service, reduced the German navy to 15,000 men without capital ships or submarines, and forbidden Germany to create and maintain a separate air force. Furthermore, Germany was not allowed to maintain any armor, heavy artillery, or chemical weapons. The Allies, especially France, clearly intended to limit the role of the German army largely to constabulary duties, thereby preventing the reemergence of any substantial military threat.

The Versailles treaty elicited virtually universal disapproval across the political spectrum in Germany; the armed forces themselves took steps to rearm covertly both within and outside the Reich. The General Staff, forbidden by the Allies, emerged in embryonic form in one of the administrative offices of the army. Men who were trained in the numerous flying clubs that emerged in Germany entered the army to form the core of a future air force. During the 1920's officers tested armored warfare doctrine and practiced chemical warfare in the Soviet Union, another nation that regarded itself as a pariah in the Versailles settlement. "Police units" began to arm and train secretly, forming what was called the "black Reichswehr," or "black defense force."

Any examination of the German military between 1933 and 1945 must address the central role of Adolf Hitler (1889-1945), who combined the function of chief executive of the Nazi state with that of supreme commander of the armed forces. Consequently, the rise to power of the National Socialist German Workers' (Nazi) Party had profound implications for the armed forces. Hitler, appointed chancellor in January, 1933, had repeatedly and explicitly called for the abolition of the Treaty of Versailles and for the rearmament of Germany. The Nazis espoused a worldview predicated on a virulently racist and anti-Semitic social Darwinist conception of struggle among nations and individuals for resources and power. A perceived racial hierarchy of peoples placed the "Aryan" Germans at the top, the Germanic and Latin peoples of Europe in the middle, non-Europeans and Slavs near the bottom, and Jews in the lowest category. Hitler fervently believed the Jewish people to be the source of capitalism, Socialism, and Marxism, and he felt that the sole intention of the Jews was to corrupt and ultimately destroy the so-called Aryan race. Consequently, he believed, the Aryans had to eliminate the Jews and expand Aryan territory into the Soviet Union in order to survive and flourish. Germany would acquire this "living space" in Eastern Europe only through military conquest, which, in turn, hinged on rapid rearmament and expansion.

Following the death of President Paul von Hindenburg (1847-1934) on August 2, 1934, Hitler combined the offices of chancellor and president and required civil servants and members of the armed forces to swear a personal oath of loyalty to him. Between 1935 and 1939, Germany openly rearmed and

expanded its territorial boundaries. In March of 1935, Hitler announced the reintroduction of conscription and the existence of a German air force, or Luftwaffe, thereby abandoning any pretense of honoring the Treaty of Versailles. Initial British and French indifference to growing German assertiveness can be explained by fear of a military conflict potentially costlier than World War I, preoccupation with domestic political and economic issues, latent guilt about the perceived severity of the Versailles treaty, and Hitler's adroit invocation of the right to national self-determination.

The German armed forces generally distinguished themselves during both this time period and the war years through their willingness to support Hitler's long-term goals of territorial conquest. Hitler drew on old German traditions of loyalty, duty, and honor, citing the personal oath that each member of the military took upon induction and general agreement with the political goals of the regime, to turn the German military into a willing and able instrument of his will. He also ensured the cooperation of senior commanders with enormous bribes. The government created a separate, fourth armed service, the armed Schutzstaffel, or SS, parallel to but separate from the regular army, navy, and air force. This force provided the regime with its own Praetorian Guard, which literally served as Hitler's bodyguard and army. In this way, Hitler developed a counterweight to the regular military, which he did not completely trust.

It is important to note that the armed forces generally agreed with the regime's policies. When disagreement arose, it usually centered on details and not on the general intent of policy. For example, Hitler believed that time would only serve the interests of Germany's enemies. Consequently, he informed the armed forces at a secret conference in November, 1937, of his intention to wage war and defeat Austria, Czechoslovakia, France, and Great Britain by 1943 at the latest. After that time, he believed, the major European powers would have enhanced their military capabilities sufficiently to defeat Germany. Many generals questioned the timetable but not the substance of Hitler's intentions. Most senior commanders, then, did not oppose wars of aggression as long as Germany could wage them when and where it wanted. Although some officers contemplated staging a coup in 1938, and others would mount unsuccessful assassination attempts against Hitler, the majority of Hitler's soldiers, sailors, and airmen readily did his bidding. Indoctrination with Nazi ideals, fear, corruption, and careerism all played a role in the acquiescence of Germany's military to Hitler's will.

Although Italy had been on the victorious side at the end of World War I, many Italians were angered by the Treaty of Versailles, which barely rewarded Italy for its efforts. What particularly angered Italy was the refusal to hand the city of Fiume to the Italians, who took it and briefly held it. With the country having the potential of degenerating into chaos, in 1922 Benito Mussolini came to power and started to rebuild Italian pride, albeit at the cost of democracy—his Blackshirts attacked communists and democrats alike.

The new Italian army that emerged under the Fascist rule of Mussolini was essentially—with the royal

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German chancellor Adolf Hitler and Italian dictator Benito Mussolini in Munich, Germany, in 1934.

TURNING POINTS

1919	The restrictions imposed on the German military by the Treaty of Versailles at the end of World War I meet almost universal disapproval across the political spectrum in Germany.
1933	Adolf Hitler, leader of the National Socialist German Workers' (Nazi) Party, is appointed chancellor of Germany and calls for the abolition of the Treaty of Versailles and the rearmament of Germany.
1939	Hitler uses combined arms forces to invade Poland, which is then partitioned between Germany and the Soviet Union.
1941	Germany invades the Soviet Union, advancing as far as Moscow and Leningrad.
Jan. 20, 1942	Wannsee Conference finalizes plans for extermination of the Jews.
1942-1943	The Russian defeat of the Germans at the Siege of Stalingrad marks the ultimate German failure on the Russian front.
July, 1943	The Germans are defeated by the Russians at the Battle of Kursk, one of the largest tank battles in history.
1945	The German city of Berlin is besieged by Russian air, artillery, and tank attacks that ultimately bring about German surrender.

army, navy, and air force—continuing the traditions prior to 1922. These remained nominally under the command of the king of Italy. However, there was also the Milizi Volontaria per Sicurezza Nazionale (MSVN), which was the military arm of the Fascist Party and under Mussolini's direct control. These forces were involved in fighting in foreign wars, as well as when Italy itself was invaded by the Allies in 1943.

MILITARY ACHIEVEMENT

The German military registered some of the most impressive accomplishments in the annals of warfare before sustaining one of the costliest defeats in recorded history. The conquest of Poland in September 1939 was their first victory, but achieved at a cost. However it was followed by lightning campaigns in Denmark and Norway in April, 1940, before its greatest victory in May and June of 1940, when the Germans, skillfully combining armor, infantry, and aircraft, conquered territory in the Benelux countries and France, over which they and the Allies had fought for months and years during World War I. The conquest of Belgium witnessed the first large-scale use of air-dropped paratroopers in history. In April of 1941 the Germans rapidly conquered Greece and Yugoslavia. Concurrently they waged a protracted war in North Africa, where they had initially intervened to assist Italy in its failed attempt to conquer Egypt. There, German forces would continue to engage the Allies until May of 1943. In 1941 and 1942 Germans advanced in the Caucasus to the border of Asia and in Egypt toward the Nile Valley and sank numerous American ships within sight of the eastern seaboard of the United States.

In the East, Germany mounted the largest invasion in world history on June 22, 1941, with its attack on the Soviet Union. That summer and fall, German forces captured more than 3 million Soviet prisoners and killed and wounded countless numbers of Red Army troops. German units advanced to the outskirts of Moscow before a Soviet counteroffensive, attenuated supply lines, and the harsh Russian winter blunted and then repulsed the German offensive. Despite this setback, the Germans would continue to mount offensives in the Soviet Union, until they suffered a major defeat at the hands of the Red Army during the massive armored offensive at Kursk in July, 1943. In the context of the savage ideological conflict against their dual enemies, Judaism and Bolshevism, what the Nazi regime called "Judeo-Bolshevism," the Germans inflicted casualties amounting to some twenty-five or twenty-six million dead Soviet civilians and military personnel.

At roughly the same time, in the summer of 1943,

losses in German submarines began to exceed replacements in the bitter and protracted Battle of the Atlantic, and the Combined Bomber Offensive mounted by the strategic bomber forces of Great Britain and the United States against strategic targets in Germany began to wear down the German air force over the Reich itself. Historians, therefore, generally consider 1943 the year in which World War II began to turn irrevocably against Germany. Nevertheless, despite the growing material strength, proficiency, and determination of the Allies, German troops conducted skillful fighting withdrawals from Italy, northwestern Europe, and the Soviet Union, exacting heavy casualties even as they retreated. German troops distinguished themselves through tactical virtuosity, resilience, and determination. German scientists developed and the Reich launched the V-1 and V-2 rockets, the first cruise missiles and ballistic missiles, respectively, at targets in Great Britain, Belgium, and the Netherlands. Germany had thereby in some respects advanced to the frontier of aerospace research and technology.

The Italian army fought over a longer period than the Germans, but with far less success. Although the Italians were involved in the attack of Corfu in 1923, their first major military action was with the invasion of Abyssinia in 1935-1936. Although well organized, the Italians were more prepared for a European war, and that invasion had not allowed for the poor conditions of roads and the bitterness of the guerrilla

Hulton Archive/Getty Images

Parisians flee the city as German troops approach in 1940.

warfare waged by the Abyssinians, which hindered the Italian advance considerably. Although the Italians achieved a victory, it was not an easy one. Italian soldiers also fought in the Spanish Civil War, though technically as volunteers. Subsequently, in April of 1939, the Italians invaded Albania in what proved to be their easiest military action. That against France in June of 1940 was badly managed and again did not allow for the ground conditions. In October, 1940, the Italian invasion of Greece and its subsequent actions in Yugoslavia also went badly. Italians fought the Allies in North Africa and from 1941 in the Soviet Union. However, it was during the Allied invasion of Italy in 1943 when the Italian army fought most tenaciously, although by that time some were supporting the Allies and others, with German support, were holding back the Allied advances in southern Italy.

Time & Life Pictures/Getty Images

In July, 1943, a U.S. soldier looks out over the city of Gela, Sicily, at explosions off the coast.

WEAPONS, UNIFORMS, AND ARMOR

Most of the German army during the war carried a version of the Mauser Gewehr 98, a 7.92-millimeter, bolt-action rifle with a five-shot magazine. The weapon weighed approximately 4 kilograms and had a range of 800 meters. Submachine guns issued to German troops included the MP38 and MP40, which differed only in external appearance. The MP38 had a smooth case, whereas the MP40 had a ridged one. This weapon carried thirty-two rounds of 9-millimeter ammunition in its magazine and weighed slightly more than 4 kilograms. It had a rate of fire of 500 rounds per minute and a range of approximately 100 meters. The standard machine gun was the MG34, which remained in service until it was phased out by the MG42. That weapon, in turn, was superseded by the MG45. All three machine guns could be fired as either a light, with a bipod, or a heavy machine gun, with a tripod. The MG34 and MG42 used 7.92-millimeter ammunition, whereas the MG45 fired 7.62-millimeter rounds. The rate of fire was 900 rounds per minute in the light machine gun configuration and 300 rounds per minute in the heavy machine gun configuration.

Field artillery consisted of guns and howitzers ranging from 7.5 to 10.5 centimeters in caliber. Heavy field artillery guns ranged in caliber from 15 centimeters upward. The Germans also used a 28-centimeter rail gun that weighed 218 tons and fired a 255.5-kilogram shell. Another very famous artillery piece was the 8.8-centimeter antiaircraft gun, which fired a hypervelocity round and proved especially effective as an antitank weapon.

The best-known piece of German apparel was perhaps the jackboot, made of black leather and worn by all units except mounted troops. The

"marching boot" extended up the leg to just below the knee; the sole was heavily studded, and the tip steel-tipped. The infantryman's trousers were gray, straight-legged, and unpiped except for those that formed part of parade dress. The single-breasted tunic was fastened down the front by five dull metal buttons. The turned-down collar consisted of a dark green cloth, and a patch indicating the arm of service adorned each side of the collar join. Eyelet holes in the tunic waist could hold support hooks for the leather waist belt and the equipment that fitted onto it.

The standard greatcoat was double-breasted, field gray in color, with a green collar. It was worn by all ranks, up to that of general, and by all arms of service. Helmets appeared in five basic sizes and weighed between .82 and 1.2 kilograms. Two holes provided ventilation, and a lining of thin leather cushioned the crown of the wearer's head. Soldiers of all ranks wore a peaked cap with a field gray top, a dark-green cap band, and a shiny ridged peak.

The Germans designed some formidable tanks during the war. Especially notable were the Mark V, or Panther, sometimes described as the best tank of the war. It weighed approximately 53 tons and was powered by a 700-horsepower engine with a capacity of 23 liters. Its 7.5-centimeter gun offered good penetration of enemy armor, and its steeply sloped superstructure made it more difficult for enemy gunners to score direct hits on the turret. With a weight of nearly 70 tons, the Mark VI, or Tiger, was the heaviest operational tank of any combatant nation during the war. It carried an 8.8-centimeter gun and was heavily armored, with its turret front 10 centimeters thick. This bulk and heavy armor might well have reflected the defensive nature of warfare conducted by Germany during the last two years of the war. Germany also developed and deployed a tank-destroyer version of the Panther tank. This vehicle used the same basic chassis as the Panther and carried an 8.8-centimeter antitank gun in an enclosed, turretless superstructure.

Mussolini, the Italian dictator, boasted that he could raise some 8 million bayonets. However, at full strength there were only slightly more than 2.5 million under arms. The Italians' equipment varied considerably with the location of the fighting, with the elite Alpini, who defended Italy's northern frontier, being well armed, but with many others in the Italian forces being armed with the single bolt-action Mannlicher-Carcano Model 1891. As with weapons, the Italian army had a range of uniforms. These varied because of the climate in the areas where they were fighting. In Abyssinia and later in North Africa, the Italians wore khakis, either large, baggy trousers or shorts. In Europe, their armies wore gray woolen clothes.

Military Organization

Hitler, in his capacity as führer (leader), retained overall direction of the German armed forces, collectively called the Defense Force, or Wehrmacht. A war minister had exercised high command until the dissolution of the war ministry in 1938. Hitler then established a high command of armed forces (OKW) as the body through which he would direct the war. He appointed Wilhelm Keitel (1882-1946), who distinguished himself through particular obsequiousness, as chief of staff and Alfred Jodl (1890-1946) as head of operations.

Hitler exercised tight control over Germany's conduct during World War II for several reasons. First, each member of the armed forces was bound to him by the oath of loyalty. Second, the Prussian army officer code had fostered introspection and emphasis on the purely technical aspects of the conduct of war. Consequently the German officers excelled at the tactical level, performed well at the operational level, and proved deficient at the strategic level. Hitler, however, believed that he possessed an infallible grasp of strategy and in the course of the war began to involve himself increasingly in the details of military operations. He did so both because of his growing confidence in himself, especially after Germany's stunning victories in 1940, and because of his growing distrust of his senior commanders. Hitler had, after all, advocated the attack on Poland and the Benelux countries against the advice of most of his senior commanders, who feared that Germany was insufficiently prepared for full-scale war at the time. The

rapid victories had vindicated Hitler in his own eyes and, it should be noted, in the perception of many others as well.

The armed forces lacked a single voice, and this allowed Hitler to exercise his tight control over them. The service chiefs all had direct access to him, but usually they acted as partisans of their own branches and not in tandem with the other armed forces. Hitler also actively encouraged his subordinates in the military as well as the civilian branches of government to compete among themselves. He thereby preserved for himself the role as final arbiter in any dispute and prevented any power block from forming against him. Unfortunately for Germany, this approach also largely prevented effective coordination of the armed forces into an instrument of coherent strategy.

Mussolini directly controlled the MSVN, the militia, which remained loyal to him. The royal army, navy, and air force were technically under the command of the King of Italy, and thus when Mussolini was deposed in 1943, some supported the new pro-Allied Fascist government, while others remained loyal to Mussolini.

DOCTRINE, STRATEGY, AND TACTICS

Any discussion of tactics and strategy should begin with definitions. One working definition of tactics is the application of doctrine, or techniques involving the deployment of personnel and weapons, to the winning of individual military engagements. The lieutenant commanding a platoon of perhaps thirty to fifty infantrymen would apply doctrine learned in training and through battlefield experience to defeat an enemy platoon by deploying his machine guns in one location, his mortar team in another, and so forth. On the next level, scholars point to operations as a subset of military affairs. Operational warfare involves the application of doctrine to win campaigns, such as the German conquest of France in 1940. In the spring of 1940, then, German commanders used resources at their disposal to defeat an enemy in a series of military engagements of regional geographic expanse and relatively brief duration. Strategy occupies the highest level of military affairs and consists of the harnessing of economic, military, and political resources to secure a political victory in a military conflict. One could sum up Germany's performance during World War II by noting that the Germans excelled tactically, performed well operationally, and ultimately proved woefully deficient strategically. Good tactics will allow a combatant nation to win battles, whereas good strategy will allow it to win wars.

Several factors explain this phenomenon. The Germans emphasized rigorous and realistic training and initiative. Convalescing veterans would train new units of soldiers and thereby impart, at least theoretically, valuable experience to recruits. The army also exercised great care in selecting soldiers from the same geographic areas to serve in the same units, thereby strengthening unit cohesion. As casualties mounted, however, this practice became ever more difficult to implement. Soldiers were encouraged to think two levels above their rank. Consequently, if their immediate superiors were killed or disabled in combat, subordinates could assume control. The German military distinguished itself through its use of mission-oriented orders. A commander would order his subordinate to complete a certain task at a specific location during a specified time period, such as the holding of a ridge against advancing American tanks. The way in which a subordinate subsequently executed the order, however, was usually his own responsibility. Such an approach lent itself to a flexible response to combat, which by its very nature is fluid. Good tactics, in turn, allowed the armed forces to execute successful campaigns between 1939 and 1941.

Germany's deficiencies manifested themselves most vividly at the strategic level and explain the Reich's ultimate defeat at the hands of the Allies. Hitler's control of the armed forces meant that his background and views affected the conduct of the German military significantly. He was determined to avoid the stalemate that had characterized the western front during World War I. He also believed that the collapse of the home front had caused Germany's defeat during that war. Consequently, the Germans could avoid defeat by mounting swift attacks using combined arms. German infantry, armor, and aircraft would mount coordinated strikes against the en-

Popperfoto/Getty Images

The rubble of bombed-out buildings in Hamburg, Germany, in July, 1945.

emy's weak points and then punch through the front line. The regular infantry, marching on foot as it had from 1914 to 1918, would subsequently encircle and either destroy or capture enemy troops. Hitler believed that this "mailed fist" would ensure swift victory, which in turn would mean that the Reich could eschew full-scale mobilization and the ensuing sacrifices that would be required of the civilian population, such as rationing and the mobilization of male and female civilians in war-related industries.

The Germans proved singularly unable to organize their economy efficiently, due to competing loci of power within the Nazi Party and government and to the sheer ineptitude of those tasked to run the country during wartime. The Germans, unlike the Allies, also had never waged real coalition warfare. There was, for example, no Combined Chiefs of Staff linking the highest-ranking German, Italian, and Japanese commanders. Germany's fate was sealed by Hitler's fervent belief in both his own infallibility and the ascendancy of willpower over material preponderance, by his overestimation of German capabilities and concurrent underestimation of Allied capabilities, and by the subservience of the German armed forces. Germany's enemies, in contrast, all learned from their mistakes, improved their own initially inadequate tactics, and mobilized their economies for full-scale war much earlier and more efficiently.

Unlike the German army, the Italians were not nearly so well mechanized, and they continued to make heavy use of horses, which in Abyssinia and Albania proved effective given the poor roads. However, this reliance proved to be a weakness else-

where, especially during the Allied invasion of Italy. The Italians' tactics prior to that invasion had been to try to extend Italy's colonial power, whether over Abyssinia, Albania, North Africa, Yugoslavia, or the Ionian Islands. Italy was also providing troops for the German war effort in the Soviet Union. Later Italy's objective was to prevent an invasion on its own soil. After the 1943 invasion, the Italians fragmented, with some supporting the Allies and others remaining loyal to Mussolini.

CONTEMPORARY SOURCES

Two very important contemporaneous sources are *The German Army* (1939), by Herbert Rosinski (1903-1962), and *The Handbook of German Military Forces* (1945), by the U.S. War Department. Rosinski assessed the performance and thinking of the Germans and discussed at length the changes that had transpired in the mindset of German commanders. The breadth of vision that had characterized the nineteenth century reformers Gerhard Johann David von Scharnhorst (1755-1813) and August von Gneisenau (1760-1831), Rosinski argued, had yielded to a narrowly technocratic approach to war that emphasized tactical and operational proficiency at the expense of the vital, and ultimately decisive, element in military affairs: strategy. The handbook provides the reader with a plethora of valuable technical information about the organization, weapons, and equipment of the German armed forces and likely provided the U.S. Army with a most useful tool as it fought Germany in the waning days of World War II. An invaluable translation entitled *Hitler's War Directives, 1939-1945*, edited by H. R. Trevor-Roper, appeared in several editions (London: Pan, 1966). Hitler's own *Mein Kampf* (1925-1927; my struggle) is available in English translation by Ralph Manheim (1939; reprint, Boston: Houghton Mifflin, 1999), and the 1935 diary of his lover Eva Braun can be read in a 2000 edition from Spectrum International, *The Diary of Eva Braun*.

Although Mussolini tried to encourage the martial spirit in Italy, compared to the information on the German army there are far fewer works on the Italians available in English. Some of these include Primo Levi's *Se questo è un uomo* (1947; *If This Is a Man*, 1956; revised as *Survival in Auschwitz: The Nazi Assault on Humanity*, 1961); Eugenio Corti's *Few Returned: Twenty-eight Days on the Russian Front, Winter 1942-1943* (1997); and Donna M. Budani's *Italian Women's Narratives of Their Experiences During World War II* (2003).

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Oliver Griffin

World War II

Japan

Dates: 1931-1945

Political Considerations

The core of Japan's military institution, the Imperial Japanese Army, began its ascendancy to political dominance in the 1930's. Through the intimidation and, often, the assassination of its political opponents, the military succeeded in controlling the inner circle of advisers to the Japanese emperor, Hirohito (1901-1989). The army, citing its loyalty to the emperor, subscribed to a theory of preparation for total war and devised a master plan that sought to make Japan the primary political power in Asia and the Pacific.

The Japanese Kwantung Army, which, following World War I, had occupied bases in Manchuria by treaty with the Chinese, provoked a confrontation with local Chinese authorities there and launched a series of military strikes that ended with the occupation of Manchuria in 1931. Six years later, in the vicinity of the Marco Polo Bridge near Beijing, the Japanese alleged an attack by elements of the Chinese Nationalist Army and launched a campaign of full-scale warfare against China in an attempt to dominate, control, and occupy much of the country.

The U.S. government, together with a number of Western European nations, sought to oppose the Japanese expansion. These nations launched an economic embargo seeking to limit the growth of Japanese military and naval power. Because Japan lacked many of the natural resources needed to produce the supplies and equipment required to fuel a powerful military machine, these restrictions prompted the more aggressive elements in the Japanese army to press for an all-out war against the United States and its European supporters, mainly the British, Dutch, and French, all of whom had colonies on both the South Asian continent and the islands situated off it. In September, 1939, the Japanese, seeking to counteract the power of the Allied nations, signed the Tripartite Pact with Germany and Italy, allying itself with those two Fascist nations in their confrontation with France and England.

In 1940 Japan had established bases in French Indochina—the present-day countries of Vietnam, Laos, and Cambodia. On December 7, 1941, the Japanese launched a surprise attack on the American naval base at Pearl Harbor, in Hawaii, while at the same time invading the Philippines and the Malay Peninsula. The Japanese forces then attacked the Dutch East Indies, which they seized for its critical oil fields.

Military Achievement

The initial attacks by Japan's armies and navy proved to be spectacularly successful. The task force that attacked Pearl Harbor consisted of six aircraft carriers with 183 planes aboard and supporting vessels. This force wreaked havoc on the unprepared American fleet tied up at the base. The Americans lost or suffered severe damage to eighteen warships. Some 2,335 sailors were killed, and an additional 1,178 were wounded. The Japanese lost only twenty-nine aircraft and fifty-five flyers in the attack. The Imperial fleet returned to home base with no loss to its surface units.

The isolated Central Pacific U.S. bases at Guam and Wake Island fell quickly to the Japanese, who also occupied both Kiska and Attu, in Alaska's Aleutian Island chain, forestalling any move by the United States to use the Aleutians as a base in a retaliatory attack.

The Imperial Japanese Army also enjoyed a series of quick successes in its campaigns in the Philippine

Islands, the Malay Peninsula, and the Dutch East Indies. Although the Americans put up spirited defenses on Luzon's Bataan Peninsula and Corregidor, by April 9, 1942, the Japanese had secured control of the Philippines. General Douglas MacArthur (1880-1964), commanding the combined American and Filipino forces, had received his orders to leave for Australia before the actual fall of the Philippines. President Franklin D. Roosevelt (1882-1945) and the Allies needed him to prepare that continent against attack in the event that the Japanese moved in that direction.

The British defense of Malaya and Singapore proved to be even more disastrous. Despite numerical superiority, the British were no match for the Japanese infantry, whose units included the best of the Imperial Japanese Army. By February 15, 1942, Japan had captured Singapore, gaining control of the entire Malay Peninsula.

The Japanese had advanced into both Burma and the Dutch East Indies as well, ensuring the island empire's supply of both rice and oil. In fewer than one hundred days, the Japanese military had accomplished all of the goals originally established by Imperial General Staff.

The euphoria of these early Japanese victories had disappeared by mid-1942. Their advance in the Pacific islands was far less successful. In April of that year, U.S. B-25 bombers flew off a carrier to conduct a raid on the cities of Tokyo, Yokohama, Kobe, and Nagoya. Moreover, the Americans turned back Japanese invasion fleets intent on taking all of New Guinea to the south and Midway, formerly Brooks Islands, to the east. In the latter battle, a turning point in the war, the Japanese lost four virtually irreplaceable aircraft carriers and some of their best naval aviators. General MacArthur then began a campaign to recover all of New Guinea and to take back the Philippines. This action by the Americans ended the threat of Japanese invasion of Australia.

Simultaneously, the U.S. Navy began a series of attacks on Japanese island bases in the mid-Pacific: the Gilbert Islands, the Marshall Islands, the Mariana Islands, and the Caroline Islands. One by one, these critical outposts fell to the U.S. Navy and U.S. Marines, leaving Japan open to both direct air attack and the threat of the ultimate invasion of the home islands themselves.

By August, 1945, U.S. military forces had succeeded in reconquering all of the Pacific bases previously seized by the Japanese. They had even captured the island of Okinawa, the key Japanese base in the Ryukyu Island chain, only 380 miles south of Kyūshū, one of the Japanese home islands. The U.S. forces had also severed Japan's supply lines to the south, depriving the Japanese of raw materials, such as oil, that were critical to their ability to continue the war. The ultimate weapons in the U.S. attack proved to be the two atomic bombings of the cities of Hiroshima and Nagasaki, which forced Hirohito to surrender.

Weapons, Uniforms, and Armor

During the late 1930's, the Japanese government built a powerful military and naval machine. Its infantry, artillery, and air forces acquired extensive ex-

Turning Points

July, 1937	Japan invades China.
Dec. 7, 1941	The Japanese attack on the U.S. fleet at Pearl Harbor, Hawaii, brings the United States into World War II.
June 4-7, 1942	Japanese loss of aircraft carriers at the Battle of Midway undermines the possibility of holding earlier gains in the Pacific.
1944	The Japanese begin kamikaze attacks on Allied ships in the Pacific.
Apr., 1945	In the last major amphibious offensive of World War II, U.S. forces invade Okinawa and, after meeting fierce resistance, seize the island from Japan.
Aug. 5, 1945	The United States drops an atomic bomb on the Japanese city of Hiroshima, killing more than 70,000 people.
Aug. 15, 1945	Emperor Hirohito announces Japan's surrender.

WORLD WAR II: JAPAN AND THE PACIFIC THEATER

perience in Manchuria and in their invasion of China. The Imperial Japanese Army relied heavily upon a well-trained, mobile, and aggressive infantry that was trained and skilled in hand-to-hand combat. During the Malayan Campaign, for example, the British forces with their motorized equipment were handicapped by narrow roads through the heavy jungle. The Japanese infantry mounted bicycles to navigate the landscape, riding on the wheel rims when they blew tires and shouldering their bicycles to ford rivers.

The enlisted man in the Japanese army was dressed poorly. He seldom shaved and wore a patched uniform with unpolished boots and insignia. He was poorly armed, with only a rifle and a bayonet. He walked rather than marched. Extremely fit, he covered surprising distances.

The quality of the machine guns available to the Japanese infantry remained marginal, especially since infantry tactics counted on heavy machine-gun support. Japanese tank and artillery support fell far below the level of that of their enemies. Tanks operated

more in the capacity of armored personnel carriers than of powerful mobile heavy weapons. Artillery had proven unnecessary in the Chinese campaign, mainly because the Chinese themselves lacked formidable artillery support. The situation changed radically when the Japanese forces had to fight against heavily armed U.S. land and sea forces.

The Japanese air forces depended primarily on their speedy, highly maneuverable Mitsubishi A6M2 Zero fighters. Early in the war these aircraft dominated the skies over China, the Dutch East Indies, and the Philippines. Opposing pilots could not match the Zero's speed. The Zero fighters, flown by skilled and highly trained pilots, dominated the opposition. Although the plane proved to be mechanically superior to those of Japan's opponents, it was never modified in any meaningful way from its initial model. As the war progressed, the U.S. aircraft industry began to turn out planes that were both faster and better equipped than the Zero. The Japanese plane's lack of armor also resulted in a higher mortality rate among its corps of pilots. Another, often fatal, flaw lay in the plane's lack of self-sealing fuel tanks. The Japanese bomber fleet suffered even more from a lack of sufficient armor. The bombers, handicapped by slow speed as well as the vulnerable fuel tanks, found themselves easy targets for Allied pursuit aircraft.

The Japanese navy built a formidable naval force centered around several super-battleships of the Yamato class, the largest vessels of that category ever built. However, these capital ships played no meaningful role in the naval battles that occurred after the American navy recovered from the Pearl Harbor attack. Most naval authorities suggest that Japan might have been more successful had it instead built more aircraft carriers, because these ships proved to play a critical role in the naval warfare of World War II. The Imperial Japanese Navy lost many of its carriers early in the war, in May, 1942, at the Battle of the Coral Sea, but more important at the Battle of Midway from June 3-6. Japanese industry was unable to build replacements quickly enough to keep up with its opposition. The Japanese also lacked a sufficient number of support vessels, especially for the transport of critical supplies, such as oil from the Dutch East Indies.

The Japanese submarine fleet did not conduct long-range raiding campaigns on U.S. shipping, as did the German fleet in the Atlantic Ocean. More often it operated either as part of larger fleet units or as supply ships for the army's increasingly isolated Pacific island bases. U.S. submarines, in contrast, preyed constantly upon the limited number of Japanese merchant ships and the extended supply lines on which Japan depended to move materials to its home islands.

Military Organization

Japan had, by 1940, become a totalitarian nation. The military, utilizing Hirohito as a symbol, had organized Japanese society into a cohesive body dedicated to the worship of the emperor and total obedience to a government dominated by the leaders of the Japanese Imperial Army and Navy. Civilian diplomats, including the country's prime minister, served only to cover the aggressive planning of the military factions. Japanese industry no longer operated as a competitive economic entity in the world market, as manufacturers subordinated themselves to government control and dedicated themselves to meeting the needs of the armed forces.

The war in China had, however, decimated both Japan's manpower and its resources. By mid-1941 Japan had already lost 185,000 soldiers, and peace in China remained elusive to Japanese planners. The Japanese High Command, however, insisted on the empire's expansion to provide the raw material necessary for the growth of Japan as a major global power.

One critical factor continued to plague the military hierarchy throughout the 1930's and 1940's: An intense rivalry existed between the army and navy factions. Each force had its own assessment of the direction the armed forces should take, and they quarreled constantly over the country's military priorities.

The Japanese army saw Japan's major long-term enemy to be the Soviet Union and its implied threat of a communist world revolution and sought to concentrate the empire's resources on a continuing buildup

of its ground forces and support troops on the Asian mainland itself. The army saw the European colonies on the continent's southern boundaries as the solution to its needs for basic commodities to strengthen its military capabilities. It was prepared to go to war with the United States only if that country denied Japan the raw materials necessary to create and maintain a self-sufficient empire.

The Japanese navy saw the United States as Japan's primary threat. It recognized the potential of the powerful American fleet, with its capabilities for a wide range of operations throughout the Pacific, its virtually unlimited supply of fuel, and its shipyard construction capacity. The navy sought to increase substantially its number of capital ships in order to confront the American navy on an equal basis. It preferred to postpone any conflict with the United States until Japan was strong enough to meet the U.S. fleet on equal terms.

Admiral Isoroku Yamamoto (1884-1943), commander in chief of the Imperial Navy's combined fleet at the time of the attack on Pearl Harbor, was not carried away by the success of the raid. He believed that his country would have to force the United States to sue for peace within six months of the attack or the opportunity for a successful outcome of the conflict would be lost. Subsequent events proved him correct: After suffering initial reverses, the United States rebounded to seize control and, ultimately, to win the conflict.

NARA

On May 11, 1945, in the Pacific theater, two Japanese kamikaze pilots directed their aircraft into the USS Bunker Hill *off Kyushu.*

Both arms of the Japanese military maintained their own separate air forces, as did those of the United States. However, the U.S. Army and Navy generally cooperated, with joint strategies. The Japanese army and navy did not; the two arms operated individually, often without effective communication. For example, in December, 1941, during the first naval attack on Clark Field in the Philippines, Japanese army bombers flew into the path of the incoming naval aircraft conducting an assault of the field.

On occasion the two separate air arms deliberately withheld critical information from each other. At Nagoya's Mitsubishi factory, workers strung a curtain between projects separately assigned to the site by the army and navy, thus preventing an interchange of ideas between the two groups. Throughout the war the army and navy took turns condemning the other for operational failures.

U.S. Navy

The tail section of a Japanese Suisei aircraft on the deck of the USS Kitkun Bay *after exploding over the ship.*

Doctrine, Strategy, and Tactics

Both the Japanese army and navy adopted the warrior code of bushidō as a way of life. This philosophy came to be defined as one of absolute loyalty to the emperor and of bravery, frugality, simplicity, and unhesitating sacrifice. The military government sought to indoctrinate the people of Japan with the same spirit of self-sacrifice. The island nation's enemies came to realize that Japanese soldiers, sailors, and even civilians would fight to the death and would rather die than surrender. In battle after battle, despite overwhelming evidence that further conflict was useless, Japanese soldiers fought until killed by the enemy. Only at the very end of the war, on Okinawa, did numerous members of the Imperial Japanese Army surrender.

The officer caste demonstrated an even greater degree of commitment to bushidō. When faced with certain defeat, many officers chose to commit seppuku, or ritual suicide, by disemboweling themselves, a practice also known as hara-kiri. If time did not permit, they ordered their aides to dispatch them with a pistol shot to the head.

In late 1944 in the Philippines, and later during the Battle of Okinawa, the Japanese army and navy air forces began to organize a special attack corps called the Kamikaze, (*kamikaze* means "divine wind"). The name recalled a typhoon that struck the Japanese home islands in 1281, destroying a Mongol fleet invading from the Asian mainland and saving the island nation. The flyers of the Kamikaze Special Attack Corps deliberately rammed their aircraft into Allied naval vessels, at formidable cost to the ships and men serving aboard them.

Japanese officer candidates began at the age of fourteen as recruits in military prep schools. At seventeen, promising aspirants transferred to a more advanced preparatory school in Tokyo, where their real

training began. Future officers completed their schooling at the military academy in Ichigaya. Subjected to constant heavy indoctrination, they adopted the concept of "a will which knows no defeat." Their mentors emphasized physical conditioning and discouraged independent thinking. Future officers were expected to subscribe fully to the bushidō code. They, in turn, demanded the same obedience to orders from the enlisted personnel under them.

Throughout the many battles for the islands of the Pacific, the sites were secured by invading U.S. soldiers only after every last Japanese fighter was killed. On Saipan and Okinawa, Japanese civilians, both men and women, joined the doomed soldiers in the final conflict. In the case of Okinawa, 150,000 civilians, one-third of the island's population, died following the U.S. invasion, often accompanying and aiding soldiers and sailors of the Imperial Army and Navy.

The bushidō code had its dark side. By Western standards Japanese army and navy units engaged in substantial violations of human rights in their contact with civilian populations in conquered lands and with captured military prisoners. After seizing the city of Nanjing from Chinese forces in 1937, the Imperial Japanese Army ran amok, slaughtering an estimated 250,000 of the city's civilian population. Tens of thousands of Chinese civilians were also massacred in Singapore soon after the Japanese capture of the city.

In another example of contempt for those who chose to surrender, during the so-called Bataan Death March (1942) Japanese soldiers killed thousands of captured American and Filipino troops suffering from illness and exhaustion. After their surrender some of the weakened and starving prisoners had failed to keep pace with the march to prison camps ordered by their conquerors. Those who fell behind were summarily shot or beaten to death. A similar series of atrocities took place on the Burma-Siam Railroad, and in the Sandakan Death March. In these cases and in many others, the Japanese failed to recognize the precepts of the Geneva Conventions as they applied to the humane treatment of prisoners of war.

The overall strategy of the Japanese military counted on the capture of critical Southeast Asian areas that were rich in resources. Once secured, the army was prepared to hold these bases tenaciously, while the navy protected the seas around them. The Japanese High Command expected the troops in the field to resist to the last man any forces seeking to dislodge them. Unfortunately for the Japanese strategists, Japan lost both air and sea supremacy as the war continued. The island bastions fell one by one. Finally, U.S. forces dropped atom bombs on cities in the home islands, which the Japanese could no longer successfully defend.

Tactically the Japanese military depended on the tenacity of its infantry, termed by the military propaganda as "men of spirit." Adopting this concept, the infantry followed a pattern of aggressive offensive tactics. Convinced of his superior physical conditioning, the Japanese soldier sought to close with the enemy and engage in hand-to-hand combat, often in nighttime sneak attacks. The military planners designed this approach to terrify their opponents.

With the use of Kamikaze air and sea formations, the Japanese High Command believed it could exact such fearful losses on U.S. naval and civilian shipping that the United States would refrain from trying to invade the Japanese home islands. Even after the Japanese armed forces lost their ability to stop the advancing Allied armies, they prepared to give up their lives rather than surrender. This Japanese commitment to self-destruction, as well as the potential loss of both American and Japanese civilian lives, motivated U.S. president Harry S. Truman (1884-1972) to use atomic bombs on Hiroshima and Nagasaki in order to convince Japanese emperor Hirohito to surrender his nation.

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English translations of Japanese texts actually written during World War II are rare. Some insight into the Japanese thinking at the time can be found in Paul S. Sakamaki's *I Attacked*

Pearl Harbor (1949) and in Nyozekan Hasegawa's *The Japanese Character* (1966), which contains a collection of essays written between 1935 and 1938. There were also a few other autobiographical works, such as Ashihei Hino's *War and Soldier* (1940) and R. Nagatsuka's *I Was a Kamikaze* (1973). Masanobu Tsuji's *Singapore: The Japanese Version* (1960) remains one of the few accounts in English by an officer involved in planning the Pacific war. During the 1930's, the Japanese published a large number of propaganda magazines, such as *Contemporary Japan*, that include details on the military but that tried to portray Japan as suffering from the depredations of other countries.

The best contemporary American source of information on Japanese thinking and action can be found in Ruth Benedict's *The Chrysanthemum and the Sword* (1946). A cultural anthropologist, Benedict presented a graphic analysis of Japanese thinking and customs at the time of World War II. One chapter of her book contains a specific analysis of the thinking of the Japanese military.

The writings of American military personnel found in government reports and military journals also furnish a Western analysis of Japanese military activity. Among these are *The Japanese Story of the Battle of Midway* (1947), compiled by the U.S. Office of Naval Intelligence and published by the U.S. Government Printing Office. There are also official histories by the British, such as S. Woodburn Kirby's *The War Against Japan* (5 volumes, from 1957), and by the Australians, starting with Lionel Wigmore's *The Japanese Thrust* (1957).

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Carl Henry Marcoux

WARFARE IN THE POLITICAL AGE

China
Modern Warfare
Dates: Since 1912

Political Considerations

Late nineteenth century China was ruled by the imperial government of the Qing (Ch'ing) Dynasty, which had its capital at Beijing (Peking). Although the royal family and most senior officials were Manchus, an ethnically and linguistically distinct Northeast Asian people who had overthrown the native Chinese Ming Dynasty in 1644, ethnic Chinese elites retained control over local affairs. China's military apparatus atrophied, and clashes with expanding European powers led to stunning military defeats. Meanwhile, China's economy failed to sustain industrial development, and widespread peasant rebellions compounded economic instability and further eroded the Manchus' political authority.

The imperial government authorized a military modernization program designed by scholar and military strategist Li Hongzhang (Li Hung-chang, 1823-1901). Li oversaw the construction of weapons factories and shipyards, but financial and political difficulties stunted his efforts. After Li's forces were defeated by Japan during the First Sino-Japanese War (1894-1895), Japan took control of the island of Taiwan, humiliating the Qing court and sparking an expansion of Li's military modernization program. Li's reforms elevated a new generation of Chinese military commanders, who soon threatened the weakened Manchus. The Boxer Rebellion (1900), an antiforeign uprising by secret societies, further demonstrated Qing vulnerability, with the court initially hoping that they could use the uprising to achieve their objectives without having to commit their army, although they eventually did so with disastrous results. The court's decision to form a national assembly in 1910 failed, and the imperial government collapsed in 1911.

Attempts to restore the Qing Dynasty continued until 1919. Meanwhile, competition had developed between isolationist military officers led by General Yuan Shikai (Yuan Shi-k'ai, 1859-1916), based in northeastern China, and the pro-Western Nationalist Party, or Guomindang (Kuomintang), led by Sun Yat-sen (Pinyin, Sun Yixian, 1866-1925), based in southern China. Sun's meager armed forces were crushed by Yuan's allies in 1913, and the introduction of democratic elections was cut short. Yuan's associates arranged for him to be named emperor, but his death in 1916 ended their cooperation. Instead, their armies clashed with each other during China's Warlord Period (1916-1928).

Sun Yat-sen sought democratic government in China, but he recognized that military unification must precede political modernization. Sun's small force was defeated in 1922 by the warlords of central China. Nonetheless, Sun's Nationalist Party opened the Huangpu (Whampoa) Academy to train officers loyal to Sun and the academy's president, General Chiang Kai-shek (Pinyin, Jiang Jieshi, 1887-1975). Before Sun's death in 1925, the Nationalist Party formed an alliance with the small Chinese Communist Party, which drew its support chiefly from China's tiny urban working class. Communist leader Zhou Enlai (Chou En-lai, 1898-1976) was the chief political instructor at Huangpu, and soon both Nationalists and Communists were recruiting officer trainees there.

This period of alliance, known as the First United Front, ended when Chiang's forces attacked Communist networks in August, 1927. The Communists fought back but were scattered. A splinter group, led by Mao Zedong (Mao Tse-tung, 1893-1976) retreated into a mountainous hinterland and began recruiting peasants to party membership. Meanwhile,

Chiang unified most warlord armies under his command. During the early 1930's, he attacked Mao's base areas, and the Communists' peasant army was forced to retreat to more remote rural areas in China's interior on a 6,000-mile trek known as the Long March.

Meanwhile, Japan's encroachment into China's northern provinces expanded in the mid-1930's to include central China. In 1936 a new alliance, known as the Second United Front, was forged between the Nationalists and Communists, who pledged to cooperate against Japan. Mao used the respite from Nationalist attacks to expand the Communist Party. As the 1940's began, Japan advanced into southern China and most of Southeast Asia, while the Nationalist armies quietly awaited Allied victories over Japan in the Pacific. The Communists, meanwhile, achieved wide popularity by harassing Japanese troops and installations and by implementing land reforms and building Party networks behind Japanese lines.

After Japan surrendered in 1945, units of the Communist-led People's Liberation Army (PLA) occupied the rural areas of most northeastern provinces, while Nationalist forces were airlifted to the major cities. Military clashes soon escalated into a full-scale civil war. With widespread popular support, Communist forces swept through northern and central China. Hundreds of thousands of Nationalist troops fled or defected. Finally, in late 1949, the remaining Nationalist troops gathered on the island of Taiwan, where Chiang established a government-in-exile. The Communist Party under Mao founded its national government in Beijing in October, 1949.

In 1950, acting as the Chinese People's Volunteers, PLA troops entered Korea in aid of the Korean communists' quest to unify the peninsula. Chinese Communist troops also reinforced the coast nearest Taiwan, pursued remnant Nationalist units along the border with Indochina and Burma, and moved to establish Communist Party authority in Tibet. In Korea, however, the PLA faced U.N. forces led by the United States until a ceasefire agreement was concluded in 1953. There was also a war with India from June until November 1962.

During the late 1950's political tensions between Beijing and Moscow caused cancellations of Soviet aid programs. Small clashes between Chinese and Soviet border guards began in 1962 and continued until 1969, when main force units fought at the Ussuri River. Meanwhile, China inaugurated a nuclear weapons program in the early 1960's. By 1967, after testing both fission and hydrogen weapons, China had become a full-fledged nuclear power. China also provided military aid to the Communist regime in northern Vietnam, then involved in a protracted war involving U.S. forces.

Despite upheavals during the Cultural Revolution (1966-1976), China's military was safeguarded. However, the troops' military effectiveness suffered when they were assigned to construction, agricultural, and other civilian tasks. In a short-lived operation against Vietnamese Communists in 1979, PLA units were defeated, but not before inflicting some damage on their opponents. Communist leader Deng Xiaoping (Teng Hsiao-p'ing, 1904-1997) introduced free enterprise and relaxed political controls, unleashing protests in 1986 and 1987. Responding to a student-led free speech movement, the PLA suppressed protests in Beijing's Tiananmen Square in 1989. The resulting deaths of students and civilians provoked international condemnation of the Communist government. During the 1990's propaganda reinforced the PLA's allegiance to the Communist Party, while its manufacturing and other economic enterprises were privatized.

Also during the 1990's there was an overhaul of Chinese military tactics and weaponry. Both were modernized with two major objectives. The first was the maintenance of Communist Party control within China itself. After the events in Tiananmen Square in 1989, there were few major protests in most of China, but there were many in Tibet and among the Uighurs of northwest China. The Chinese government undertook to allow freedom of speech in Hong Kong after 1997, and they have done so. When, in 1996, it looked as though Taiwan might declare independence rather than maintaining itself as the Republic of China, the political leadership and military of the People's Republic flexed their muscles by firing missiles over Taiwan. Later they changed their approach to be far more conciliatory.

However, the more important developments within the military were to face possible confrontations from outside. The controversy over the U.S. spy plane incident (the Hainan Island incident in April, 2001) demonstrated to the Chinese that there was still a worry about U.S. incursions. With the Chinese continuing to invest heavily in their air force, there was also uncertainty over events in North Korea and the possibility of the Chinese intervening to support the North Korean government should it face an external invasion.

Turning Points

1928	Chiang Kai-shek captures Beijing and, as leader of Nationalist Party, heads China's first modern government.
1934-1935	Mao Zedong leads his Communist forces on 6,000-mile strategic retreat known as the Long March.
1937	Japan invades China, initiating Second Sino-Japanese War (1937-1945).
1946-1949	Civil war rages between Nationalist and Communist Party forces, resulting in the triumph of Communism and in Chiang Kai-shek's flight to Taiwan.
Oct., 1950	Chinese troops intervene in the Korean War.
Nov. 10, 1950	China invades and conquers Tibet.
Jan.-Feb., 1955	People's Republic of China and the Republic of China (Taiwan) battle over islands in the Taiwan Straits.
Mar.-Apr., 1959	Tibetan insurrection is quashed.
Oct.-Nov., 1962	China fights a border war with India.
1964	The People's Republic of China conducts its first successful nuclear weapons test.
1966	Mao Zedong initiates a decade-long Cultural Revolution to purge his opponents from the Communist Party and renew the people's revolutionary spirit.
Feb.-Mar., 1979	Border war with Vietnam.
Apr.-June, 1989	Chinese government monitors and militarily disperses Tiananmen Square democracy protests.
1993	"Revolution in Military Affairs" leads to the reorganization of the army along modern lines.
July, 2009	Urumqi riots are quashed.

Military Achievement

China's defeat in 1895 bolstered the position of Manchu reformers who endorsed military modernization. Their great accomplishment was the creation of the "New Armies," in which Chinese soldiers were uniformly organized under professional officers and armed with modern weapons. These brigades were trained in European tactics, organized into specialist battalions that included artillery and engineers, and armed with imported European weaponry.

In the 1920's warlord armies undermined domestic order and caused economic havoc. The unification of most warlords under the Nationalist Party of Generalissimo Chiang Kai-shek reestablished Chinese political unity and laid the foundation for the reemergence of a united Chinese state.

From 1934 to 1935 the Communist Party leadership under Mao Zedong was able to preserve an experienced corps of military leaders by undertaking the "strategic retreat" known as the Long March. By withdrawing rather than confronting superior Nationalist troops, the Communists retained an autonomous and politically reliable military force. This People's Liberation Army engaged both U.S. and U.N. forces during the Korean War (1950-1953). The PLA achieved virtually complete surprise in moving some 400,000 troops into North Korea to stop the Allied advance toward the China-Korea border in October, 1950. Chinese manpower, aided by Soviet air and technical support, scored major victories against Allied forces, eventually culminating in cease-fire negotiations and a stable division of the Korean peninsula.

Despite international isolation and domestic upheavals in the late 1950's and 1960's, Communist Party officials, military leaders, and engineers developed China's nuclear weapons program. After the

CHINESE CIVIL WAR, 1926-1949

first successful test shot in 1964, China's military establishment also undertook development of missile-based weapons delivery systems.

The PLA, which managed manufacturing, agricultural, and transportation systems during the 1970's and 1980's, shed its auxiliary enterprises during the 1990's. Free market companies assumed some functions; others were eliminated completely. At the same time, through joint ventures with foreign companies, the PLA acquired advanced military technologies, especially in the aerospace sector.

In 2003, China managed to launch its first man into space, an event that heralded a major space program with undoubted military objectives. The Chinese have also managed to keep up a modernization of their air force and missile technology.

WEAPONS, UNIFORMS, AND ARMOR

China's imperial army was equipped chiefly with simple metal weaponry, particularly swords, shields,

and spear-tipped poles. The bow and arrow were standard equipment as late as 1910. "Bannermen," the Qing Dynasty's regular troops, included some units selected for "modernization." These troops were issued flintlock muskets, outdated by European standards. Each soldier carried his gunpowder ration in a vulnerable bamboo case.

In the early 1900's the "New Armies," composed of native Chinese, planned for artillery units to be attached to each division; in reality, however, the use of artillery pieces and ordnance was rare. Infantry firearms varied in design and caliber and included weapons of Japanese, German, and French manufacture, as well as locally produced copies. Ammunition was frequently unavailable. Both artillery and muskets were manufactured using British designs at the Jiangnan (Chiangnan) Arsenal near Shanghai. The modernized Beiyang (Peiyang) Fleet was commanded by military reformer Li Hongzhang and included China's earliest armored elements, metal-plated gunwales and armored steamships from the Fuzhou (Fuchou) Arsenal.

From 1911 China's armies adopted European-style uniforms of cotton tunic coats with standing collars, trousers, and peaked caps. Winter outfits included quilted jackets and leather boots. Rank insignia were adopted and affixed to cuffs and caps, with colored shoulder straps and cap bands indicating branch of service. Labor units assisting the Allies during World War I wore tunic and trouser outfits without insignia, and cloth shoes.

During the Warlord Period, the number of men under arms in China grew rapidly. Primarily landless laborers, warlord soldiers enlisted for three-year to five-year tours of duty. Weaponry symbolized status, and functioning weapons quickly passed on to new owners from dead or wounded soldiers. Machine guns and artillery were scarce, as were spare parts. In the northern provinces cavalry units were common, but southern unfamiliarity with horses stunted cavalry development there. Chiang Kai-shek contracted with U.S., Soviet, and British arms dealers to supply his Nationalist troops, who received huge quantities of weapons, ammunition, and supplies from the U.S. government during the Chinese Civil War (1926-1949).

After World War II (1939-1945), Communist forces seized Japanese weapons and supplies, including winter uniforms of leather boots, lined caps, and quilted jackets. During the Civil War, Nationalist troops also lost large stockpiles of U.S. military equipment, including heavy artillery, machine guns, and explosives, to the Communists, who later used it against U.S. troops in Korea. At the same time Chinese troops were sent to Korea with inadequate clothing, including lightweight summer uniforms, shoes made of rubber and canvas, and few hats or gloves.

The PLA in the early 1950's had few trucks, aircraft, or ships and lacked modern logistical systems. The Soviet Union provided some vehicles and ships and supervised development of specialized systems such as quartermaster, field communications, and antiaircraft batteries. Soviet advisers also oversaw the introduction of rank insignia on PLA uniforms, a step that Chinese leaders had opposed as elitist.

After Soviet aid was withdrawn in 1959 and 1960, Chinese research and development efforts accelerated. The PLA Navy produced antiship missiles, underwater ordnance, submarine weapons systems, and electronic countermeasures technology. A first generation of Chinese destroyers, submarines, deep-water survey vessels, and frigates was introduced during the 1960's. Antisubmarine destroyers became a production priority in the 1970's, as did mine sweepers and acoustic guidance systems for submarine missiles. During the 1980's development of nuclear-powered submarines became a premier national goal. In 1985 China's leaders endorsed a plan to prepare for "local war under high-tech conditions," and ordered the military integration of computer technology. In 1999 a ten-year plan was adopted for investments in highly advanced weaponry, including submarine-launched ballistic missiles and missile defense systems.

After China's nuclear weapons capability was demonstrated in 1964, the development of more advanced delivery systems became a priority. In 1965 research began on intercontinental ballistic missiles capable of delivering nuclear warheads to the continental United States, a goal achieved in the mid-1980's. In 1957 PLA soldiers began to be outfitted with increasingly sophisticated radiation protection

equipment, including face masks, disposable clothing, and special rubber boots and gloves. This would increase in later decades, especially after the war with Vietnam in 1979. The lack of success in that conflict saw an overhaul of the supply systems for soldiers.

The launching, in 2003, of the first Chinese Taikonaut (astronaut) into space was greeted with great pride by the Chinese and represented a major move for the Chinese military into space technology on top of an extensive series of satellites.

MILITARY ORGANIZATION

During the late Qing period, the imperial Manchu and native Chinese bureaucracies each maintained distinct military organizations. Manchu forces known as "bannermen" were responsible for national defense, whereas Chinese armies and militia managed civil administration, revenue collection, and local security. Economic dislocations cut the number of bannermen supported by the imperial government from 250,000 in 1840 to about 170,000 in 1900. Bannermen were compulsorily enrolled from Manchu clans and organized into a series of "banners," sociomilitary groups based on kinship among the clans. Manchu soldiers were traditionally skilled horsemen, but cavalry units had disappeared by 1895, and in many imperial garrisons bannermen were primarily bureaucrats.

After China's defeat by Japan in 1895, officer training academies were opened with Japanese instructors, most of them influenced by the German principles of military conscription, centralized command, and standardized troop organization. In 1904 an imperial commission approved plans for a new national army of native Chinese, composed of thirty-six divisions manned at half strength during peacetime. European systems of officer ranks and reserves were introduced, with supplies and logistics managed at the divisional level. The divisions raised were poorly armed, and junior officers developed personal loyalties to their commanders rather than to the government. Yuan Shikai emerged as a leader from among these commanders, and between 1908 and 1911 conservative Manchu officials tried unsuccessfully to remove troops from his control. After the collapse of the Qing Dynasty, Yuan utilized his personal networks to consolidate his power.

During the Warlord Period following Yuan's death in 1916, his allies raised larger armies with less stringent organizational schedules. Personal loyalties meant that officers of like rank were not interchangeable, and the lack of weapons and training inhibited the development of specialized units such as artillery and engineers. In 1937 Nationalist general Chiang Kai-shek reorganized the Nationalist Army to promote his political allies. A system of regional war theaters was devised under which Chiang's trusted lieutenants were concentrated in northern and central China near Communist base areas. Less reliable warlord armies lately merged with Nationalist forces were deployed against the Japanese in the coastal provinces.

The internal characteristics of the Communist People's Liberation Army (PLA) reflected its rural origins. Many of its early officers had no formal command training and relied heavily upon personal connections to consolidate their authority. Regional field armies, each with a particular mix of peasants and professionals, emerged during the 1930's. The PLA also developed large labor corps recruited from the peasantry for transportation and construction projects. Their recruitment relied upon propaganda and coercion rather than forced conscription. Soldiers and laborers were induced to "volunteer" to help their villages meet manpower targets. Terms of service were unlimited, and no leave was permitted.

During the 1930's the communist military organization gained a commissariat, a system of Communist Party operatives whose structure paralleled that of the army. The commissars' function was to assure the allegiance of the military forces to the Party. Political surveillance was conducted from the squad level up using the "three by three" method, in which each soldier was observed by two others whose reports influenced both his and their advancement. The commissariat was governed by the General Political Department of the Communist Party, and the PLA was controlled by the Central Military Commission under the Party's Central Committee.

By 1944 Communist troops numbered 500,000 soldiers and 2.1 million militia, distributed among ten base areas in northern and central China. During the Civil War the PLA expanded both by recruiting peasants and by absorbing Nationalist defectors. In mid-1946 there were 1.3 million PLA regulars, in 1947 there were 2 million, in 1948 there were 2.8 million, and in early 1949 there were 4 million. Because PLA commanders anticipated huge losses during the Korean War, most of the main force units deployed were politically suspect former Nationalists. Ultimately fifty-five divisions, almost one-half the PLA's effective strength, were committed. Each division had three infantry regiments, an artillery battalion, and multiple auxiliary units. Transport, signal, and supply corps were attached to each regiment, and total division strength was around 10,000 men.

The Korean experience and Soviet advisers influenced the modernization of the PLA, equipping it for conventional rather than guerrilla conflict. In the mid-1950's the PLA's "field army" designation was abandoned, and troops were instead organized into thirteen military districts. In 1955 a massive demobilization discharged 4.5 million men, and conscription was instituted to maintain PLA strength at 3 million; demobilized veterans manned militia units. In 1948 PLA forces in coastal areas developed specialized marine units, and a separate naval command was created in 1950. By the mid-1960's the PLA Navy comprised three fleets with administrative and operational bases at Qingdao (Tsingtao), Shanghai, and Guangzhou (Canton). The PLA's air wing was organized in the early 1950's with Soviet aircraft and training. In the 1960's China began manufacturing military aircraft based on Eastern European and Soviet designs, and PLA air defense units assumed responsibility for radar, early warning, and antiaircraft installations. By the mid-1980's the PLA Air Force was the third largest in the world, comprising sixty-one hundred total aircraft including fighters, bombers, helicopters, transports, and reconnaissance airplanes.

A special PLA unit, the Second Artillery, was created in 1959 to exercise control of nuclear weapons, but its structure remains secret. A special weapons production and testing force was also established. Selected air squadrons trained for airborne nuclear weapons deployment, and the military oversaw development of a ballistic missile-based warhead delivery system in the 1960's and 1970's. Specially trained units were made responsible for the security of fissionable materials and nuclear devices.

In the 1980's and 1990's these and other units trained in high-technology fields, including air de-

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Mao Zedong in the 1930's, speaking before the Kangdah Cave University, calls for resistance against the Japanese.

fense, submarine warfare, and intelligence were enlarged. The proliferation of specialist arms of the PLA demonstrated the Chinese military's doctrinal shift from popular participation in a "people's war" to the articulation of main force operational plans appropriate to a technically advanced battlefield environment.

During the 1990's, the Chinese were involved in continuing to develop their missile program and their nuclear arsenal. In 1996 missiles were fired over Taiwan as a warning as the people there voted and it looked as though they might seek independence ending the Republic of China. The Chinese government has built up its navy, which was involved in disputes over the Spratly Islands and some other islands in the South China Sea. With the increasing wealth of China, many Chinese military officers began to travel overseas far more than ever before, and this led to far greater engagement between the Chinese military and other countries than ever before.

DOCTRINE, STRATEGY, AND TACTICS

In the late 1800's Qing military administrators relied upon long-standing convictions about China's invulnerability to attack, based on both its geography and traditional assumptions about the superiority of Chinese civilization. Deployment of the Manchu bannermen followed a garrison strategy in which permanent encampments were placed near key cities and transportation routes. This strategy left troops isolated from local economic and political activity. Stagnant social climates resulted, as the bannermen's family compounds rather than their military units became the focus of garrison activity.

Although Chinese troops had virtually no role in World War I (1914-1918), warlord officers were influenced by European battlefield experiences. With modern weapons in short supply, warlord armies regularly used close-order infantry tactics. The general scarcity of heavy weaponry benefited any force capable of fielding even a single piece of artillery. Fortresses and cities protected for generations by mud brick walls were suddenly vulnerable to damaging artillery attacks.

Communist theoretician Mao Zedong began developing his base area strategy in the late 1920's. He combined policies such as land reform, popular with China's huge population of poor peasants, with political propaganda and recruitment to military organizations. These forces, using primarily small-unit guerrilla tactics, could protect the economic and political activities inside the zone, while political operatives expanded the area under Communist control. According to Mao, eventually the politicized rural areas would engulf urban areas and the Communist Party would seize power on a national scale. Mao also proposed the general doctrine of "people's war," in which all classes and segments of Chinese society would unite to preserve China's national integrity in the face of external aggression. When Nationalist forces overwhelmed the Communists in the early 1930's, Mao espoused the tactic of "strategic retreat," surrendering territory and conserving his forces rather than defending specific territories. When Japanese expansion and Nationalist attacks imperiled the Communist organization, Mao endorsed the "united front" approach, cooperating with the Nationalists against Japan.

Meanwhile, Nationalist troops in the coastal provinces conducted "fighting withdrawal" operations in the face of Japanese offensives, denying the Japanese important assets by destroying rail lines, rolling stock, and telegraph lines. In 1938 Chiang Kai-shek's "scorched-earth" tactics extended to destruction of earthen retaining walls on the Huang, or Yellow, River, flooding huge tracts and causing millions of deaths. After 1945 Nationalist troops concentrated in cities and guarded rail lines. In 1947 the PLA adopted a battle-intensive strategy aimed at destroying Nationalist troops in Manchuria rather than capturing and holding territory. Using frontal assault tactics and attacking rail lines, the PLA under General Lin Biao (Lin Piao, 1907-1971) crushed Nationalist garrisons and captured weapons and supplies. Tens of thousands of demoralized Nationalist soldiers defected, while PLA encircling operations scored victories throughout northern and central China.

Mao's doctrine of warfare posited that China's huge population provided it with special military ad-

vantages, including a unique ability to sustain huge manpower losses. This doctrine informed the decisions of Chinese commanders in Korea, who compensated for inferior weapons with "human wave" tactics, committing large forces to successive assaults on a target despite high casualty rates. Mao's doctrine also applied to nuclear strategy. He scoffed at American nuclear superiority, declaring that only a "few million" Chinese could be eliminated in a nuclear attack, while hundreds of millions would remain capable of defending the country. Under Mao, PLA commanders emphasized development of a "second strike" capability that would enable China to deliver warheads to targets even after being attacked with nuclear weapons.

After Mao's death these doctrines were replaced by a new emphasis on military modernization. In the event of external attack Chinese commanders would deploy professional troops with sophisticated equipment and use positional warfare tactics, rather than rely on guerrilla tactics and mass resistance by the Chinese people.

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Mao's development of a rural-based, politico-military strategy was the most significant and influential strategic doctrine originating in twentieth century China. Its first detailed explication appeared in 1927 in "Report on an Investigation of the Peasant Movement in Hunan," in which Mao defined a Communist-led revolution originating among rural agricultural peasants rather than urban industrial workers, as Soviet orthodoxy dictated. In "The Struggle in the Chinkiang Mountains" (1928) Mao described the breadth of the peasantry's support for the Communist military apparatus and emphasized the importance of concentrating forces on specific targets. In "Problems of Strategy in China's Revolutionary War" (1936) Mao argued that despite its shortcomings, the Communist-led military could prevail over larger and better-equipped forces by utilizing guerrilla and mobile main force operations. He accepted the need for a protracted struggle and for a "strategic defense" that would conserve military strength and exploit tactical opportunities. Mao's "Problems of Strategy in Guerrilla War Against Japan" (1938) outlined procedures for recruiting peasants and explained his famous revolutionary formula on rural areas engulfing the cities. Finally Mao explained the combination of main force military units with a mobilized peasantry to achieve a revolutionary victory in "The Present Situation and Our Tasks" (1947).

During the 1960's and 1970's, the Foreign Languages Press in Beijing published reminiscences of many generals, officers, and ordinary soldiers, but these rarely contained much more than anecdotes about famous incidents or battles. More detailed biographical and autobiographical works have been published in Chinese, although few have been translated into English, and of these generally only extracts have been published.

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Laura M. Calkins

The Cold War
The United States, NATO, and the Right
Dates: 1945-1991

Political Considerations

The World War II (1939-1945) alliance of the United States, Great Britain, France, China, and the Soviet Union against the Fascist regimes in Germany, Italy, and Japan masked fundamental ideological differences among the Allies, which became apparent as the victorious powers attempted to reorder international relationships. The United States, as leader of the democratic, capitalistic nations, promoted free elections, collective security through the United Nations, and freedom of trade. The Soviet Union, still stinging from the loss of twenty million dead during the war and fearful of American nuclear capability, was intent on securing its borders and surrounding itself with subservient, communist governments. As a result of these differing goals, the United States and the Soviet Union clashed over occupation of Japan, the Soviet withdrawal from Persia, the selection of postwar governments throughout Eastern Europe, the development of nuclear weapons, and the eventual fate of Germany and Berlin, which had been divided among the European victors at the end of the war. On February 9, 1946, Soviet leader Joseph Stalin (1879-1953) followed an ideological line in blaming capitalism for World War II, thus justifying an aggressive five-year plan of rearmament.

In reaction to Soviet exploitation of postwar economic instability in Europe, particularly in Greece and Turkey, American leaders implemented two programs designed to forestall Soviet influence. The Truman Doctrine (March, 1947) called for a policy of global containment of communism and offered American support for free peoples resisting foreign domination. Its economic counterpart was a European recovery program proposed by Secretary of State George C. Marshall (1880-1959) in June, 1947, with the rebuilding of the German economy at its heart. The Marshall Plan and related programs had by 1954 funneled $41 billion worth of economic and military assistance to Germany, Japan, and the countries of Western Europe, helping centrist and conservative governments to consolidate their political positions.

The United States also restructured its foreign policy institutions. The National Security Act (1947) and subsequent reforms reorganized all the military service branches under the Department of Defense, established a National Security Council to advise the president, and created the Central Intelligence Agency (CIA) to gather intelligence and conduct covert operations. Fear of revived German aggression and continued Soviet expansion led to the development in April, 1949, of the North Atlantic Treaty Organization (NATO), which provided for a unified military command structure in common defense of Western Europe. Original members included the United States, Canada, Belgium, Denmark, Great Britain, Iceland, Italy, Luxembourg, the Netherlands, Norway, and Portugal. Greece and Turkey joined in 1952, Spain in 1982. France withdrew from the military command structure in 1966, though continued diplomatic support. When West Germany was brought into NATO as a full partner in 1955, the Soviet Union responded by drawing its East European satellites—East Germany, Poland, Czechoslovakia, Hungary, Romania, Albania, and Bulgaria—into the comparable Warsaw Pact.

Fearing that American influence would follow Marshall Plan aid, the Soviet Union prohibited the governments of East European countries—East Germany, Poland, Czechoslovakia, Hungary, Bulgaria—from participating. Creation of the Communist Information Bureau (Cominform) brought communist

parties more tightly under Soviet control. Two events in 1949 raised the international diplomatic position of the Soviet Union to one of near equality with the United States, creating the superpower rivalry that lasted until 1991. After four years of civil war in China, the Russian-backed Communists under Mao Zedong (Mao Tse-tung; 1893-1976) defeated the pro-Western Nationalist Party of Chiang Kai-shek (Jiang Jieshi; 1887-1975), driving him to the island of Taiwan. In the same year, Russian scientists successfully exploded their first atomic bomb.

By 1950 the world had become clearly polarized in an ideological struggle known as the Cold War. For more than four decades, almost every facet of international relations was a battleground between the United States and its democratically oriented allies on one hand and the Soviet Union and other communist countries on the other. Both superpowers vied for supremacy in weapons, space, economics, security, and influence in the undeveloped ("Third World") nations. Ironically, with two superpowers possessing nuclear weapons by 1949, direct confrontation became so dangerous that the United States and the Soviet Union never engaged in direct warfare, instead choosing to compete through surrogates and to protect themselves by developing increasingly sophisticated technologies that made traditional warfare untenable.

Cold War tensions peaked in times of crisis, such as the Korean War (1950-1953), the Cuban Missile Crisis (1962), the Vietnam War (1961-1975), and the Soviet-Afghan War (1979-1989), with intermittent periods of cautious negotiation. When ideological and territorial disputes between Russia and China became public in the late 1950's, the democratic world was cautiously optimistic, but authentic information was hard to obtain, and it would be many years before people appreciated the extent of the rift. The most promising period of détente came in the wake of President Richard Nixon's (1913-1994) 1969 Vietnamization policy in Southeast Asia, in which the basis of U.S. policy in Vietnam was shifted from international ideological struggle to local civil war. Strategic Arms Limitation Talks (SALT) began in

National Archives

President John F. Kennedy meets with U.S. Air Force staff to discuss surveillance flights over Cuba in October, 1962.

TURNING POINTS

July 16, 1945	First successful test of the atomic bomb is made at Alamogordo, New Mexico.
Feb. 22, 1946	George F. Kennan's "Long Telegram" articulates the rationale behind Soviet aggression and advocates a firm U.S. response, with force if necessary.
Mar. 12, 1947	President Harry S. Truman introduces the "Truman Doctrine," committing the United States to responsibility for defending global democracy, a clear signal of U.S. intention to check Soviet expansion and influence.
Oct. 4, 1957	The Soviet Union launches the world s first artificial earth satellite, inaugurating the space race, sparking a reassessment of U.S. military and technologic capabilities, and providing impetus for the development of both a space program and more sophisticated weapons-delivery systems.
Oct. 14, 1962	A U.S. pilot takes pictures indicating that Soviets are placing missiles on Cuba, and the ensuing crisis takes the world to the nuclear brink before ending on October 26.
1965	The United States pursues a policy of escalated military involvement in Vietnam.
1970-1979	The United States engages in a policy of détente, seeking to establish more stable relations between it and NATO and the Soviet Union, China, and their respective allies.
Jan. 23, 1980	After an Iranian mob takes over the U.S. embassy in November, 1979, and the Soviet Union invades Afghanistan in December, 1979, the United States vows that it will consider threats to the Persian Gulf region as threats to its vital interests.
Mar. 11, 1985	Mikhail Gorbachev is chosen as the new General Secretary of the Soviet Union, and his reforms initiate a thaw in relations between the United States and the Soviet Union.
Dec. 8, 1987	U.S. president Ronald Reagan and Soviet general secretary Gorbachev sign the INF Treaty governing intermediate nuclear forces (INF) and calling for the destruction of U.S. and Soviet missiles and nuclear weapons.
1989	The dismantling of Germany's Berlin Wall signifies the end of the Cold War, as U.S president George H. W. Bush promises economic aid to the Soviet Union.

November, 1969, concluding with the SALT I agreement (May 26, 1972), which prohibited nationwide deployment of antiballistic missile systems and declared a five-year moratorium on strategic rocket launch systems. In the same year, Nixon made a historic trip to Beijing, leading to marginally better relations with the Chinese.

After decades of massive military spending, the Soviet Union had achieved a rough technological parity with the United States by the 1980's. Beginning in 1985 Soviet president Mikhail Gorbachev (born 1931) attempted to modernize Soviet political and economic institutions by restructuring the government and allowing greater freedom of expression. In March, 1988, he declared a policy of nonintervention in Eastern Europe, which rapidly led to the ouster of communist officials (1989). In December, 1989, Lithuania became the first Soviet republic to abolish the communist monopoly of political power, with other republics following suit. In 1990, the Soviet government cut back aid to communist regimes. After prolonged strikes, negotiations, and threats, the Warsaw Pact was disbanded in 1991, and the Soviet Union finally ceased to exist on December 25, 1991, leaving the United States as the only world superpower.

MILITARY ACHIEVEMENT

The principal goal of United States and NATO troops during the Cold War was to contain communism within borders established during and shortly after World War II. A major NATO action in Korea, dominated by American troops, successfully stopped North Korean communist expansion south of the thirty-eighth parallel. From the 1950's, Western ideological commitment to democratic governments

was complicated by two important prewar rivalries. First, indigenous nationalistic movements in Africa and Asia, seeking to free themselves from American influence or European colonial domination, were attracted by the communist model of anticapitalist, state-controlled economies, and by the offer of economic and military assistance from the Soviet Union. Second, and closely related to emergent nationalism, was the conflict between Jews and Arabs, which had been simmering since the advent of the Zionist movement in the 1880's, and which broke out into open conflict with the creation in 1948 of the state of Israel. Although Germany and the United States played a major role in building up the Israeli military, and the Soviet Union contributed heavily to the modernization of armed forces in Egypt, Syria, and Iraq, both superpowers stood aside from combat during the Israeli Wars (1948-1949, 1956, 1967, 1973, 1982).

Important developing nations such as Egypt, India, and Indonesia declared themselves neutral in the Cold War in 1955, but many undeveloped countries found it difficult to resist superpower pressure and enticement. Fidel Castro (born 1926 or 1927) led Cuban rebels in overthrowing the pro-American Batista regime in 1959, then joined the communist bloc in 1960. The threat posed by a socialist government in the Western Hemisphere led the United States to support the disastrous Bay of Pigs invasion (April 17, 1961). Increasing Russian support of Cuba, including the installation of silos that could house missiles capable of supporting a nuclear attack on the United States, led to the Cuban Missile Crisis of 1962. An American blockade and intense negotiations forestalled direct conflict, as the Soviets agreed not to deploy offensive weapons, though limited numbers of Russian troops remained in Cuba until 1991. Fearing further communist expansion in the Caribbean, the United States sent troops to the Dominican Republic (1965-1966) and Grenada (1983) to support pro-Western regimes.

In the wake of the French defeat in Indochina (1954), the United States in 1961 pledged to support South Vietnam in combating communist guerrillas known as Viet Cong. Despite the commitment of more than 500,000 troops at the height of the war (1964-1973) in Vietnam, the United States was unsuccessful in halting infiltration by the Viet Cong and North Vietnamese troops, supported independently by the Soviet Union and the People's Republic of China. In 1975 Communist governments were established in Vietnam, Laos, and Cambodia. Throughout Africa, the Middle East, Asia, and Latin America, the U.S. government secretly worked to undermine communist expansion. Communist or procommunist movements were successful in Ethiopia (1974), Guinea-Bissau (1974), Mozambique (1975), Angola (1976), and Nicaragua (1979) but were defeated in the Philippines (1945-1954), Burma (1948-1950), Malaya (1948-1960), Guatemala (1954), Indonesia (1965-1966), Chile (1973), Afghanistan (1978-1988), and El Salvador (1980-1992).

WEAPONS, UNIFORMS, AND ARMOR

Early Cold War battlefield weapons and uniforms were little changed from those of World War II. All NATO military organizations employed some form of khaki in varying shades of tan, green, or camouflage, depending on conditions of deployment, with other colors generally reserved for dress purposes. Battle uniforms were generally olive drab, with camouflaged U.S. M-1 helmets. The beret was the most common nonbattle headgear for NATO armies.

The M-1 .30-06 rifle remained standard issue for U.S. troops throughout the Korean War, though early prototypes of the M-14 rifle were being tested. Debates over standardization of ammunition among NATO countries led to adoption of the 7.62-millimeter round in 1953. The M-14 was finally adopted by the U.S. Army in 1957. It was replaced in 1966 as standard issue by the M-16 5.56-millimeter assault rifle, which was lighter, faster, and cheaper to manufacture. By 1969, almost all U.S. Army and Marine units were equipped with M-16's. At least a dozen countries used some version of the M-16 throughout the Cold War.

The M47 and M48 were the main battle tanks (MBTs) most commonly used by the United States and its allies during the 1950's. Though highly adaptable and still in service in the 1980's, they were increasingly replaced from 1966 by the M-551 Sheri-

dan light tank, from 1979 by the M-60 MBT, and from 1985 by the German Leopard 2. The most effective versions were fitted with British-designed 105-millimeter L7A1 rifled guns. The most advanced MBT of the Cold War was the U.S.-designed M-1 Abrams, developed during the 1970's and increasingly deployed in the 1980's.

In the air, NATO forces were outnumbered, generally about three to two, by those of Warsaw Pact nations. With better pilot training and superior equipment, however, NATO was able to maintain tactical superiority. The B-52, in several versions, remained the primary strategic bomber from the time it was introduced in 1955 until the end of the Cold War. The F-86 Sabre was the backbone of the American fighter force in the 1950's. The F-111 was the principal attack aircraft from 1967 until the introduction of the F-14 Tomcat, which was put into service in 1972 and remained the principal interceptor. During the 1980's, the NATO aircraft inventory included large numbers of American F-111's, F-15's (the primary air-superiority fighter), F-16's, F-104's, British/German/Italian Tornados, Anglo-French Jaguars, and several versions of the French Mirage. The first B-1B Lancer, designed to replace the B-52, was put into service in 1986.

The proliferation of nuclear weapons was at the heart of the Cold War arms race. In 1949, the United States possessed between fifty and one hundred nuclear weapons. During the Korean War it added more than one hundred each year and in 1952 developed the hydrogen bomb. During the Eisenhower administration, the U.S. nuclear arsenal grew from 1,000 to 18,000 warheads. Just as important as the weapons

U.S. Department of Defense

The USS Vincennes*, a guided missile cruiser, firing an antisubmarine rocket during trials in 1985.*

themselves were the means of delivering them. In 1950 the United States possessed 38 B36's, which provided the first true intercontinental delivery capability. In 1957 the Soviet Union successfully launched the first satellite, Sputnik, and the first intercontinental ballistic missile (ICBM), leading to an intensification of American research and development of similar capabilities. In early 1962, the United States enjoyed a significant lead in both heavy bombers, with 639 B-52's alone to 100 Russian bombers, and ICBMs, with 280 U.S. to 35 Russian missiles. By the early 1970's, however, the Soviet Union had surpassed the United States in the production of both, though each country had many times the number of nuclear weapons necessary for annihilating both its adversary and the earth itself.

After the peak period in Vietnam, the U.S. military reached its low point in numbers (420,000) in 1972 and remained relatively weak in troop strength, quality, and morale throughout the 1970's. At the same time, the Soviet Union made massive strides in improving the quality of its air force, navy, and missile delivery systems, leading to much debate in NATO countries about basic defense doctrines. With the growing strength of the Soviet Union and increased U.S. responsibilities in the wake of the Iranian Revolution of 1979, President Jimmy Carter issued Presidential Directive 59 (July, 1980), which ordered significant development of new forces designed to win a limited nuclear war. This was followed by the aggressive administration of President Ronald Reagan (1981-1989), which spent more than $2 trillion in building up both conventional and nuclear weapons, including the controversial space-based Strategic Defense Initiative (SDI), commonly called Star Wars, in 1983. As the Cold War drew to a close, NATO forces included about 1.1 million troops; 20,000 main battle tanks; 3,250 combat aircraft; and 650 attack helicopters, all excluding potential French contributions.

MILITARY ORGANIZATION

Throughout the Cold War, mobile army infantry units were central to the projection of American power. The U.S. Army was organized into sixteen regular divisions for fighting. Ordinarily ten of these were divided among five continental U.S. armies, and one was assigned to Hawaii. The remaining five divisions comprised two field or tactical armies, four being part of the Seventh Army in Germany, and one, along with the entire army of the Republic of Korea, comprising the Eighth Army. Of these, four were Armored Divisions, five were Mechanized Infantry Divisions, five were Infantry Divisions, one was an Air Assault Division, and one was an Airborne Division. Each division had its own supporting artillery.

In the event of war in Eastern Europe, which was the most likely scenario early in the Cold War, the U.S. Army Europe (USAREUR) would have become part of NATO's Central Army Group, which would have been responsible for the ground war from the North Sea to the Bavarian Alps. Under ideal conditions, the U.S. Seventh Army would have been joined by two British divisions, eight to twelve German divisions, one Belgian division, and two Dutch divisions. The exact French contribution in the event of a Soviet attack was unknown, but it was estimated that it would be a force of sixteen divisions.

The governing body of NATO was the North Atlantic Council, comprising ambassadors of member states. Headquartered in Brussels, the Council was headed by a European secretary general. A multinational Defense Planning Committee developed strategic policy. NATO military commands were supervised by a Military Committee of permanent military representatives from each state, with the exception of Iceland. Territorial commands were divided into those of the Supreme Headquarters, Allied Powers in Europe (SHAPE), deployed on the continent and commanded by an American general; the Allied Command, Atlantic (ACLANT), responsible for the North Atlantic region and commanded by an American admiral; and the Allied Command, Channel (ACCHAN), responsible for the English Channel and North Sea regions and usually commanded by a British admiral. A Nuclear Defense Affairs Committee (NDAC) made up of defense ministers established general policy for use of nuclear weapons.

In non-European conflicts, the United States depended first upon the Rapid Deployment Joint Task

Force (RDJTF), which included Army airborne, air assault, infantry, and mechanized divisions; armored and air cavalry brigades; two Ranger battalions; a Marine Amphibious Force; twelve tactical fighter and two tactical reconnaissance squadrons; two tactical airlift wings; one surface action group; and three carrier battle groups; along with five aerial patrol squadrons. Once deployed in an ongoing conflict such as Vietnam, the military force was restructured to meet existing circumstances. With the breakup of the Soviet Union in 1991, France wished for the European Community (EC) to take over many of the responsibilities of NATO, though Great Britain and other countries opposed any actions that might undermine defense ties with North America. The major questions facing NATO as the Cold War drew to an end involved relationships with nations of the old Warsaw Pact, which had been disbanded in 1991, and the fate of some 27,000 nuclear weapons scattered in the former Soviet republics of Russia, Ukraine, Belarus, and Kazakhstan.

DOCTRINE, STRATEGY, AND TACTICS

Fearing an increasing and overwhelming Soviet influence in world affairs, the United States based its military doctrine upon the belief that the Soviet Union was ideologically committed to relentless expansion, which in turn required a "rapid buildup of the political, economic, and military strength" of countries committed to political freedom. The countries of NATO, however, were never willing to maintain an army large enough to counter a conventional invasion by the Soviet Union. NATO therefore embraced a policy of massive retaliation, including U.S. use of strategic nuclear weapons, to fend off Russian invasion. Almost from the beginning of the Cold War, the nuclear strategy of both nations was one of deterrence, based upon the perception by both sides of the suicidal nature of any nuclear attack. In order for deterrence to work, however, it was necessary to convince the Soviet Union that nuclear weapons might be used if necessary and that any initial Soviet attack would be unsuccessful in removing the U.S. threat. In 1967, after the Soviets acquired intercontinental nuclear capability, NATO shifted to a doctrine of flexible response, suggesting that lower levels of force might be used. In terms of conventional warfare, U.S.-NATO doctrine stressed defense and technological superiority, with an emphasis on the importance of winning the first battle of a future war. The threat of tactical nuclear attack remained integral to the defense of Europe, as Warsaw Pact countries could within weeks have mobilized vastly superior conventional forces. In the early 1980's, for instance, NATO forces were outnumbered five to one in men, seven to one in armored vehicles, five to one in artillery, and between two and three to one in aircraft.

Outside Europe, the United States lacked a clear doctrine of intervention. Trained through World War II to fight total wars of annihilation, they responded uneasily to the limited objectives of warfare enjoined by potential nuclear destruction. This led to a confusion of U.S. purpose in Korea, Vietnam, Lebanon, and Nicaragua, and highly publicized conflicts, which saw General Douglas MacArthur (1880-1964) relieved of command in Korea in 1951, massive antiwar demonstrations from 1966 to 1973, and the public conviction of Colonel Oliver North (born 1943) in 1989. After the Soviet invasion of Afghanistan (1979) ended the last remnants of détente, the election of Ronald Reagan (born 1911) as president in 1981 led to a simplistic but clear doctrine that appealed to Americans after the malaise and military decline of the 1970's. The Reagan Doctrine (1985) was designed "to nourish and defend freedom and democracy" from "Soviet-supported aggression," and led to active involvement in affairs in Grenada, Nicaragua, and Afghanistan.

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John Powell

The Cold War
The Soviet Union, the Warsaw Pact, and the Left
Dates: 1945-1991

Political Considerations

In the initial years after World War II (1939-1945), there remained hope for a continuation of the Soviet-American wartime alliance, but suspicions on both sides opened a rift between the two superpowers. The new phenomenon of nuclear and thermonuclear weapons, combined with the introduction of intercontinental missiles in the late 1950's, had made a third world war "unthinkable," giving the "war" its name. Still, over the four decades of the Cold War confrontation, a number of crises defined the U.S.-Soviet relationship and affected the nations' military preparation.

In 1948 the Soviet Union cut off access to the western sectors of Berlin, located in Soviet-controlled East Germany. The United States and its allies defeated this strategy without resorting to war by using massive airlifts to support civilians. In 1949 the Soviet Union detonated its first atomic device, and in 1954, a year after the United States had done so, it developed a hydrogen bomb. After the West formed a military alliance, the North Atlantic Treaty Organization (NATO) in 1949, the Soviet bloc countered with the Warsaw Pact in 1955. The original countries of the pact were Albania, Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, Romania, and the Soviet Union. Albania withdrew in 1968, seven years after it had severed relations with the Soviet Union. Romania refused to join the other pact members in the 1968 invasion of Czechoslovakia. In 1956 the Hungarian Uprising and subsequent Soviet invasion did not bring a Western military response, leading Moscow to understand that the United States would tacitly recognize Soviet mastery over their satellites.

After the death of Soviet dictator Joseph Stalin in 1953, the new Soviet leader, Nikita Khrushchev (1894-1971), followed a policy of "peaceful coexistence" with the West. He made several trips to the United States both to participate in the United Nations proceedings and as a guest of President Dwight D. Eisenhower (1890-1969). The Soviets made new strides toward international prestige in 1957 when they launched the first human-made Earth-orbiting satellite, Sputnik, and in 1961 when they were the first to put a man in space.

In 1960 the improving relations between the superpowers suffered a setback—the U-2 incident following the shooting down of a U.S. spy plane while on a reconnaissance mission over the Soviet Union. This incident brought to public attention the reality of intercontinental missiles, rockets that could be launched from the territory of one adversary to that of the other.

In the early 1960's a number of Cold War crises further disturbed the efforts at political relaxation. In 1961 East Germany erected the Berlin Wall to stop "illegal" emigration to West Berlin. However, undoubtedly the greatest danger of the whole Cold War was the Cuban Missile Crisis of 1962, during which the United States demanded that the Soviets remove weapons from Cuba. There was during this crisis a greater possibility of escalation to nuclear warfare than at any other time during the entire Cold War period. However, the issue was resolved without war breaking out. The missiles were removed and the U.S. government agreed not to try to overthrow the pro-Soviet regime of Fidel Castro (born 1926 or 1927).

After the Cuban Missile Crisis, the Soviet Union

and the United States began measures to ease military tensions in an era of détente. The two nations installed a hotline connection between Moscow and Washington, D.C., to prevent accidental disasters. The powers engaged in the Strategic Arms Limitation Talks (SALT) in 1972 and 1974 and the Strategic Arms Reduction Talks (START) in 1986 and also agreed to nuclear test ban treaties and conventional arms reduction talks. Nevertheless the arms race between the two superpowers continued, especially in the increase of nuclear arms and missiles of various types. Both sides developed the capacity to destroy the world many times over. Although both nations also developed sophisticated chemical and biological weapons, talks limiting these were more successful than those concerning nuclear bombs.

After a period of economic setbacks and political difficulties, Khrushchev was dramatically and suddenly replaced by Leonid Brezhnev (1906-1982) in October, 1964. Although Moscow continued to seek détente with the United States, Cold War crises continued. The rift between the Soviet Union and China that had begun under Khrushchev widened, at times breaking out in actual armed conflict on the borders. The Soviet Union also became involved in a long war in Afghanistan (1979-1989).

During the 1980's the Soviet Union softened its confrontational stance, especially after Mikhail Gorbachev (born 1931) became the country's leader in 1985 and a nuclear disaster occurred at Chernobyl in 1986. Although both the Soviet Union and the United States signed new agreements, both nations also considered employing satellite-based Strategic Defense Initiative (SDI) programs, known as Star Wars. In

National Archives

Soviet Cold War leader Nikita Khrushchev speaks at the Fourth Convocation of the Fourth Session of the Supreme Soviet in January, 1956.

1991, after a failed attempt by hardliners to overthrow Gorbachev, the Soviet Union dissolved, the Communist Party lost power in Russia, and the Cold War ended.

MILITARY ACHIEVEMENT

The Soviet Union prepared for any eventual confrontation while hoping to deter the United States. Moscow continued to develop offensive and defensive weapons systems and strategies, despite mutual attempts at limitation. Like the United States, the Soviet Union came to depend on military complexes that greatly affected the economy, politics, and social structures. The military's prestige, which had fallen substantially during the Stalinist purges of the 1930's, increased in great measure. After World War II the Soviet Union established its dominance over Eastern Europe. In one sense Moscow saw this dominance as its "right," a part of the spoils of war. However, much of the territory was land that Russian imperialists had coveted since the time of the czars; some of it had actually been part of the old empire. However, Moscow did not incorporate these countries of Eastern Europe into the Soviet Union, as it had done with the Baltic states and parts of Finland and Romania that it had taken over in 1940 and 1941. Instead, the Kremlin established these Communist-led states as "people's republics." Over the course of the Cold War the Eastern European governments declared that they had evolved into the Marxist stage of socialism and changed to "socialist republics."

A major factor in the Soviet control of Eastern Europe was fear of another massive land attack and invasion of its territory across the northern tier of states, as France had done in 1812 and Germany had done in 1941. Thus tighter military control was maintained over Poland, Hungary, Czechoslovakia, and East Germany than over Romania, Bulgaria, Yugoslavia, and Albania, the southern states, which had more leeway for independent action. Stalin expelled Yugoslavia from the Communist Information Bureau (Cominform), Moscow's association of Communist states, in 1948. Albania severed relations with Moscow in 1961. Romania often opposed the

TURNING POINTS

1949	The Soviet Union tests its first atomic bomb.
1953	The Soviet Union tests a hydrogen bomb.
1957	The Soviet Union successfully tests an intercontinental ballistic missile.
May 1, 1960	U.S. U-2 spy plane is shot down over the Soviet Union.
1962	The Cuban Missile Crisis brings the United States and the Soviet Union closer than ever before to the brink of nuclear war.
1968	The Soviet Union invades Czechoslovakia, establishing the Brezhnev Doctrine of Soviet military domination over Warsaw Pact states.
1970-1979	During an era of détente, more stable relations prevail between the Soviet Union and the United States and their respective allies.
1985	Mikhail Gorbachev is chosen as the new general secretary of the Soveit Communist Party, and his reforms initiate a thaw in relations between the Soviet Union and the United States.
1987	U.S. president Ronald Reagan and Soviet general secretary Gorbachev sign the INF Treaty governing intermediate nuclear forces (INF) and calling for the destruction of U.S. and Soviet missiles and nuclear weapons.
1989	Gorbachev is elected state president in the first pluralist elections since 1917, and by the end of the year all Warsaw Pact nations had overthrown their communist leadership.
1991	After the Baltic States of Estonia, Latvia, and Lithuania are granted independence and other former soviets join the Commonwealth of Independent States, Gorbachev resigns as president and the Soviet Union is officially dissolved.

AP/Wide World Photos

A U.S. Air Force C-54 landing at Berlin's Templehoff Air Base during the Berlin Airlift in 1948.

Soviet Union and sometimes sided with the West. Only Bulgaria remained steadfastly loyal to the Soviet bloc.

Soviet armed forces were stationed in force in the northern tier. During the mid-1980's there were 194 active divisions including tank, motorized rifleman, and airborne. Sixty-five of these were stationed in the western Soviet Union, and thirty in Eastern Europe.

The six Warsaw Pact allies had an additional fifty-five divisions. After Hungary attempted to break away from the Soviet orbit in 1956, Khrushchev sent in the army and restored the Kremlin's military control over the state. Brezhnev repeated this action in Czechoslovakia in 1968, after the liberalizing Prague Spring reforms of Alexander Dubček (1921-1992). The Brezhnev Doctrine confirmed Soviet domination of Warsaw Pact states, and, with the exception of Romania, the remaining Warsaw Pact states joined the Soviet forces in the invasion.

Outside the territory of the Soviet Union and Eastern Europe, during the Cold War, Soviet military advisers were active in a number of countries, and Soviet soldiers were occasionally employed in an advisory capacity. Certainly the Soviet Union was keen to test its weaponry, and Soviet planes were used in the Korean War, albeit disguised. The Soviet Union tested its air defense systems in Hanoi during the U.S. bombing of the city during the Vietnam War.

Apart from Afghanistan, where the Soviet Union deployed large numbers of soldiers from 1979, the Soviet Army advisers were active in many other countries. In Latin America, there were Soviet advisers in Cuba after the rise to power of Fidel Castro, and later in Grenada, sparking the U.S. invasion in 1983. In Africa, Soviet advisers were present in Egypt, and in the wars in Angola and Mozambique, as well as in Libya and Ethiopia. All six countries made heavy use of Soviet weaponry.

Actively engaged in the Middle East, the Soviet

Union had close military ties with Syria, and with Iraq. Its advisers were in Baghdad during the Iran-Iraq War, and when Iraq invaded Kuwait in 1990. Indeed, a large part of Saddam Hussein's army was equipped with Soviet weaponry. India also was a Soviet ally and purchaser of Soviet weaponry, as has been North Korea and Vietnam. The Soviet Union was also in contact with many of the communist parties in Asia and elsewhere in the world.

WEAPONS, UNIFORMS, AND ARMOR

The Soviet weapons of the Cold War were planes, missiles, nuclear weapons, submarines, and tanks. The country also kept and employed conventional armies and weapons. Moscow carried out military invasions against Warsaw Pact allies Hungary and Czechoslovakia, engaged in a border skirmish with China (1969), and waged war in Afghanistan. Like the United States, the Soviet Union maintained large stockpiles of thermonuclear weapons.

The Soviets had surface-to-surface, surface-to-air, and air-to-air missiles. The latter two were used against aircraft by heat- and electronics-seeking guidance systems. Intercontinental ballistic missiles (ICBMs) and intermediate-range ballistic missiles (IRBMs) were usually armed with nuclear warheads, whereas short-range missiles employed high explosives. Surface-to-surface missiles also could be launched from ships. Cruise missiles, placed in use in the 1970's, are continuously powered and more able to evade defenses. They fly at low altitudes and are accurate and inexpensive weapons.

By 1989 the Soviets had upgraded their ICBMs to the SS18-MOD5, SS-25 for road-mobile units, and SS-24 for rail-mobile and silo-launched missiles, replacing earlier missiles that had included the SS11, SS17, SS18-Satan, and SS19-Stiletto.

Soviet submarines of the Typhoon class were armed with SS-N-20 missiles, and Delta IV-class submarines were armed with SS-N-23 missiles. Yankee-class submarines had intermediate cruise missiles. Soviet Black Jack and Bear-H strategic aircraft also were armed with cruise missiles. The Soviets also employed AS-15 long-range cruise missiles. The older Midas and Bison planes were used for in-flight refueling of the Bear-H. The SS-N-21 was a land-based cruise missile.

Intermediate-range missiles included the mobile SS-4 Sandal MRBM and SS-20 IRBM. SS-12's, SS-23's, and SS1-Scuds were short-range missiles. Soviet strategic surface-to-air missiles (SAMs) included the SA-2, SA-3, SA-5, SA-10, SA-12A/Gladiator, and the SA-X-12B/Giant. Other Soviet aircraft were the Fulcrums, MiG-31 Foxhounds, and SU-27 Flankers. The long-range Gazelle and Galosh antiballistic missiles were designed for antimissile defense. The Soviets had a space-based defense system, the Global Navigation Satellite System (GLONASS), and antisatellite missiles such as the SL-11. During the 1980's the Soviet Union introduced missiles with multiple nuclear warheads, multiple independently targetable reentry vehicles (MIRVs), on intercontinental missiles.

Tanks had always been a major part of the Soviet Red Army. In the 1960's the Soviets began use of the T-64, the first real improvement since World War II. The improved T-64A and T-72 followed. In the 1980's the standard was the T-80 model with nuclear, biological, and chemical protection and enhanced firepower. More than 1,400 T-80's were stationed in Eastern Europe, in addition to a greater number of the older models. During this period the Soviets also replaced their old artillery with mobile and self-propelled 152-millimeter guns with nuclear capability, 240-millimeter mortars, 203-millimeter self-propelled guns, and a 220-millimeter multiple rocket launcher capable of firing chemical and high-explosive munitions.

In Afghanistan the Soviet forces relied on search-and-destroy tactics, especially in aerial attacks. MI-6 Hip, MI-8 Hook, and the most modern MI-24 Hind helicopters sought out guerrilla strongholds while fixed-wing aircraft carried out carpet bombing attacks. However, the Afghan guerrillas' heavy machine guns forced the helicopters to fly higher and lessened their effectiveness. In the first years of the war in Afghanistan, the Soviets used tank columns supported by helicopters to attack villages suspected of hiding insurgents. Although many villages were destroyed, this tactic was ineffective against the

guerrillas. In order to keep their casualties low, Soviet infantry rarely engaged in open battle.

Soviet airborne brigades were sent into Afghanistan by helicopter. The Soviets would also encircle Afghan villages and then move in from different directions. After 1982 they began to use smaller, more flexible units, but their reliance on helicopters led to the United States arming the Afghan resistance with surface-to-air missiles, which changed the nature of the war considerably.

By 1984 Soviet equipment losses included 546 aircraft, 304 tanks, 436 armored personnel carriers, and more than 2,700 other vehicles. Soviet forces in Afghanistan were attached to the Fortieth Army in Soviet Central Asia. Initially they sent five airborne and four motorized rifleman divisions. Elements of six other rifleman divisions and smaller units were added. Weapons included T-72 tanks and 152 self-propelled howitzers. The Soviets also employed MI-24 gunships and Sukhoi Su-25 frogfoot fighter-bombers and MiG fighters. New weapons included the AGS-17 automatic grenade launcher and the Kalashnikov AK-47 rifle. Although Western sources accused the Soviets of using chemical warfare and antipersonnel butterfly mines in the war, Moscow denied such claims. In 1988 the Soviets introduced Scud missiles and continued to launch them into Afghanistan until 1991, even after the war was officially over.

National Archives

Shortly after Germany's partition, signs appeared in West Berlin warning residents about the new international boundaries; this one says, "Pay attention—only ten meters [away]."

MILITARY ORGANIZATION

The highest Soviet command structure consisted of three parts: the Council of Defense, led by the General Secretary of the Communist Party and including the highest political and military leaders; the Chief Military Council, the chief officials of the ministry of defense; and the General Staff, known as the Stavka. Although the first two units were political bodies, the Stavka was the actual military command. It included the Assistant for Naval Affairs, the Political Section, the Scientific Technological Committee, and ten directorates: Operations, Intelligence, Organization-Mobilization, Military Science, Communications, Topography, Arrangements, Cryptography, Military Assistance, and Warsaw Pact.

The Stavka also stood in command above the various armed services: Army, Navy, Air Force, Strategic Rocket Forces, and the National Air Defense. Special troops such as the chemical, engineering, signal, and civil defense corps were directly under the ministry of defense.

Each of the five services had a commander in

chief, one or more first deputy commanders in chief, and a chief of political administration equal in level to the first deputies. There were in addition several deputy commanders. The army and air force were deployed in sixteen military districts within the Soviet Union. The navy was deployed in four fleets. The countries of the Soviet allies were integrated into Moscow's command structure through the Warsaw Pact.

Within the Warsaw Pact, there was a Combined Supreme Command, established in 1956 with its headquarters in Moscow. This controlled all the armed forces of the members of the Warsaw Pact, the Soviet army being divided into those based in Germany and those under the three commands: the Baltic, Belorussian, and Carpathian military districts.

Within the Red Army itself, apart from the regional divisions, the army, at its height in the 1980's, included some 210 divisions within the ground forces. These all included soldiers who were ready for immediate action as well as those required to be called up, including reservists. National service existed throughout the Soviet Union, and this ensured that all adult males within the country had some degree of military training and were able to be called up to serve alongside regular soldiers. However NATO analysts believed relatively few were able to be called up straightway, considerably reducing the actual fighting strength for a sudden conflict.

National Archives

West Berliners look across the wall at East Berlin in 1961.

DOCTRINE, STRATEGY, AND TACTICS

Soviet military doctrine had two aspects: political and technological. The political aspect was linked to the principles of Marxism-Leninism and, in theory, placed Soviet arms in the service of maintaining the safety of the Soviet Union and other socialist states and in the service of international socialism. The more practical technological aspect called for the maintenance of a modern military, with nuclear arms, missiles, and other weaponry capable of matching that of the forces of their potential enemies: those of NATO and, in later years, China. Soviet doctrine sought to prevent a nuclear attack, and the nation's great stockpile of nuclear weapons and delivery systems supposedly served as a deterrent.

Although publicly denying it, Moscow did not rule out the use of a preemptive strike. The Soviets kept their nuclear arsenals ready to be deployed at a moment's notice. The Stavka developed massive retaliation, second-strike, and flexible response strategies. The country's arsenal included tactical nuclear weapons.

In 1968, as Alexander Dubček carried out liberalizing reforms in Czechoslovakia, Soviet forces invaded and returned the country to Moscow's hardline socialism. Although this action was part of the Soviet policy of keeping the northern tier of Eastern Europe under control, it also established the Brezhnev Doctrine, that Soviet military force would ensure that no socialist country would shed Soviet ideological principles.

The Soviet Union's most serious "hot" war of the Cold War era was in Afghanistan. On December 27, 1979, the Soviet army invaded Afghanistan after a factional dis-

pute among the Afghan leaders threatened the pro-Moscow government there. The Soviet forces, initially 80,000, had increased to 120,000 by the end of the war in 1988. In addition Moscow sent about 10,000 military and civilian advisers. The Afghan army fighting under Soviet command had an additional 40,000 troops. The government and Soviet forces were engaged in a guerrilla war by a broad coalition of opponents with over 150 small units supplied with American and other foreign arms and operating out of neighboring Pakistan. The Soviet military doctrine, geared toward tank and infantry battles in flat areas, was unprepared for mountainous insurgency warfare, and their forces suffered from inappropriate training, deficient equipment, and low morale. With Mikhail Gorbachev's coming to power in 1986, Soviet efforts evolved away from winning the war and propping up the regime toward finding a way to withdraw. The war in Afghanistan was a major cause of the downfall of the Soviet Union and the end of the Cold War. The official Soviet casualties were 13,310 dead, 35,478 wounded, and 311 missing.

The invasion of Afghanistan extended the Brezhnev Doctrine beyond Eastern Europe. However, unlike Czech leaders in 1968, the Afghani leaders were not moving away from Marxism. Their factional fighting caused instability and opened the door for counterrevolution. The invasion took place during the American-Iranian hostage crisis, and the Soviet Union feared the spread of the fundamental Islamic movement into the Muslim republics of the Soviet Union.

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Frederick B. Chary

Israeli Warfare

Dates: Since 1948

Political Considerations

Israel is a state measuring 27,000 square kilometers (including the West Bank and Gaza), with about 20,000 square kilometers within the Green Line, Israel's pre-1967 border. It has a population of about 6 million. It is a country where there is no distinction between foreign and defense policy and where the prime minister traditionally holds the defense portfolio. Israel has concluded peace agreements with Egypt and Jordan but is still technically in a state of war with all its remaining neighboring countries.

Military Achievement

The formation of the Israeli army goes back to the 1920's and 1930's, when Jewish settlements needed protection against attacks by local Arab forces and the British mandate government. As the numbers of Jewish immigrants to Palestine, both legal and illegal, increased, a military force known as the Haganah (Hebrew for "defense") was founded. After statehood in 1948, the Haganah became the core of the Israel Defense Forces (IDF). The IDF initially functioned as a militia of volunteers, lacking any ranks or uniforms. It also had an elite unit as a special strike force known as the Palmach. This unit was based on the *kibbutzim*, or cooperative settlements, which served as frontline fortresses during the 1948 Arab-Israeli War. The youth of these settlements were organized as agriculturalists and military reservists, receiving training as members of a special organization known as Nahal. Other assault strike forces were founded by various factions of the Jewish underground, such as the Irgun Zvai Leumi, headed by Menachem Begin; the Stern, led by Yitzhak Shamir; and Lohamei Herut Yisrael. These were later merged with the Haganah, which became the IDF. From these beginnings and due to the revolutionary origins of these forces, the lines between the civilian and military organizations were blurred. The Israeli Air Force (IAF) dates to 1947, when the Air Service, or Sherut-Avir, was created from eleven single-engine light aircraft. Several old aircraft were purchased from the British army, to be renovated and flown by pilots with prior experience in the British Royal Air Force.

The country's response to border attacks by guerrilla groups in the past has been described as a form of massive retaliation. Following the American campaign in Iraq, however, the Israelis resorted to short military operations of the shock-and-awe type (the military technique of overwhelming the enemy with "rapid dominance" by means of extreme speed and force), which they amply utilized in Operation Cast Lead (2006) against Gaza. Despite the apparent success of its offensive doctrine, Israel found itself continuously embroiled in wars. Its persistent occupation of the West Bank, for instance, has reserved policy initiatives for the Arab side, leading to two uprisings (intifadas) and continuous internal and sporadic attacks by Palestinian militants.

Israel's clear qualitative edge and regional monopoly over nuclear weapons failed to create a state of total security as a result of several factors. One of these is the potential failure of advance warning by military intelligence, as in the 1973 October War (Yom Kippur War). Another factor that developed during that same war was the coming together and coordinated military attacks by two neighboring Arab states, namely Egypt and Syria. Israel's Military Intelligence Directorate (MID) plays a large role in provoking or instigating military attacks by providing early warning to the government about suspicious enemy troop movements or similar activity along the country's borders. The MID is a standing corps, just like the air force, which is charged with re-

sponding to surprise attacks until the reservists are fully mobilized. More important, the ability of the air force to mount a preemptive attack and render quick support for ground troops has lost its deterrent effect, largely because of the emergence of Arab guerrilla forces, which challenge Israel's seemingly limitless ability to deliver painful blows to its enemies. The lessons of the failed 1982 invasion of Lebanon, which saw Israeli troops hold the Lebanese capital under siege, are implicated in the Sabra and Shatila massacres of civilian Palestinians in September, 1982 (witness the abortive failure of the Israeli-Lebanese treaty and eventual retreat back to Israel's northern region). These failures have severely lowered Israeli faith in the effectiveness of their own superior air power and ground troops.

The Israeli attack on the Lebanese guerrilla force Hezbollah in December, 2006, was also thwarted by the unexpected show of force on the part of Lebanese irregular troops. Additionally, the U.S.-Israel alliance came under scrutiny when the 1990-1991 Gulf War forced the United States to exclude Israel from participation, even after Israel suffered from Scud missile attacks launched by the Iraqi government of Saddam Hussein. Maintaining an American-Arab military alliance during the liberation of Kuwait demonstrated Israel's limited usefulness as the United States' great strategic ally in the region. This same alliance also suffered when the Cold War ended, leaving in its wake any threat of an imminent Soviet attack on the Middle East.

WEAPONS, UNIFORMS, AND ARMOR

Early weapons of the IDF were acquired from the United States and Czechoslovakia during and just before the 1948 Arab-Israeli War. Many volunteer pilots and military personnel arrived from several countries and with varied military experience acquired during World War II. By the end of 1948, the air force had swelled to more than one hundred planes and 660 volunteer pilots and skilled mechanics.

Popperfoto/Getty Images

Jewish soldiers training in Palestine in 1948.

Israeli ground forces developed into an impressive machine, so that by the 1980's they ranked third in the world after the United States and the Soviet Union. By the 1980's, regular ground troops numbered around 450,000, divided among ten mechanical brigades, thirty-three armored brigades, twelve territorial/border infantry brigades, and fifteen artillery brigades. With the rise of the Chinese and Indian militaries, the Israeli military fell back to fifth rank in terms of effectiveness, mobility, and offensive capability. By 1994, ground forces had reached 558,112, divided into forty-two armored brigades, twenty-one infantry brigades, and six territorial brigades. Normally, ground forces would be mobilized within forty-eight hours, although this has been relaxed in recent years. Today, only 30 percent of the ground forces constitute a standing army, while the rest are maintained as reserves, who wear a uniform only one month out of the year.

The IAF increased in 1983 to 830 aircraft, and in 1993 to 1,052 aircraft, its personnel swelling from 37,000 to 45,889. The effectiveness of Israel's air power is due to keeping technical and administrative personnel per combat aircraft to a minimum. The IAF relies heavily on ground troops, maintaining only 25 percent of its air force pilots and personnel as reserves. The IAF pilot-training program was always unusually rigorous. Students aspiring to serving with the air force are required to go through a demanding set of initial tests and psychological profiling. Unlike other countries, where pilot candidates are expected to receive a college degree first, Israel enrolls successful candidates immediately after they complete high school. Students' training usually lasts about twenty months before they learn how to operate some aircraft. Students are then immersed in a regimen of applied mathematics, physics, and other scientific subjects, and are put through rigorous infantry training.

Israel is known to have acquired a significant nuclear capability, amounting to three hundred nuclear warheads by the beginning of the twenty-first century. Israel has the capacity to deliver these warheads but managed to avoid signing the United Nations' Nuclear Non-Proliferation Treaty. It is believed that Israel built two nuclear reactors, one at Nahal Soreq and one at Dimona in the Negev. The former was provided by the United States and devoted mostly to research and the training of scientists; the other was based on French technology and built in the late 1960's. Uranium was always acquired surreptitiously from a variety of European and African sources. The United States attempted to subject the Dimona reactor to inspection during the Kennedy administration but was deliberately misled about its true purposes. Israel's means of delivery of atomic payload is based on a ballistic missile code-named Jericho. It was developed in the mid-1980's based on a French design by the firm of Marcel Dassault. According to some reports, Israel maintains nuclear bases at various locations in the Galilee region. Israel is also suspected of developing chemical and biological weapons at its Nes Ziona plant south of Tel Aviv. Prime Minister Menachem Begin (1913-1992) resisted U.S. pressure during the Camp David negotiations in the 1970's to halt his country's nuclear program as a price for peace with Egypt. He also initiated the Begin Doctrine, which stated that no state in the region would be allowed to develop a nuclear capability threatening to Israel. This policy led to Israel's raid on the Osirak nuclear plant near Baghdad in 1981, the first such an attack on a nuclear facility in modern times.

Israel's defense industries had a modest start when Bedek Aircraft, Ltd., was formed by the late 1940's, in order to provide maintenance services for the country's fledgling air force. Later, this company developed into Israel Aircraft Industries (IAI), which began to produce its own line of combat aircraft, transport jets, and other vehicles. Spurred by frequent arms embargoes due to the desire of the United States and other countries to curtail Israel's frequent initiation of wars, and fearful of Egypt's acquisition of immense arms supplies from Czechoslovakia in the mid-1950's, Israel began to manufacture most of its own weapons. This effort was greatly aided by its own scientifically trained population, U.S. funds for research, and the early availability of markets for its weapons in Central and South America, Africa, and East Asia. Israel's main weapons industries have always been state-owned. They include Israel Military Industries, the Raphael Armament Development Authority, and the Haifa Shipyards. These produce a va-

riety of weapons often based on U.S. technology, such as the Kfir, its fighter plane; the Merkava, a highly rated battle tank; missile-carrying boats; a large selection of artillery pieces; and a variety of missiles. In addition, Israel produces radar, computers, and much electronic equipment, provided by the IAI's subsidiary Elta Electronic Industries. The Haifa-based Soltam Company produces guns and howitzers.

The Israeli arms industry is the country's main economic endeavor, employing an estimated one-third of the Israeli labor force and generating more than a billion dollars in annual arms sales abroad. Israel ranks in the top ten exporters of arms worldwide. Israel's arms sales are often in direct competition with the American arms industry, even though it is highly dependent on U.S. fiscal and technological assistance. One example of this relationship was the Lavi project, which sought to build a fighter plane, supported by U.S. credits that Congress approved in 1983. The Lavi project, which employed four thousand skilled workers, was canceled by the Israeli cabinet in 1986 because of its excessive cost to the United States (in the amount $2 billion). U.S. strategic cooperation with Israel and the sharing of advanced military technology were always justified by access to battlefield testing of weapons in Israel's various wars. The United States also frequently overlooked its own legislation prohibiting the use of American-supplied arms in aggressive wars, such as the Foreign Assistance Act of 1961 and the Foreign Sales Act of 1968.

MILITARY ORGANIZATION

The least important branch of IDF is the navy, although this is also changing. The navy is the smallest of the three branches because of the country's limited coastline of about 225 kilometers, which includes Gaza. After the Israeli destroyer *Eilat* was sunk by Egyptian missiles in the June war of 1967 (the so-called Six-Day War), Israel began to acquire small but fast-track boats designed by the West German firm Lürssen Werft, which were actually produced by a French company. These were fitted with Israeli Gabriel surface-to-surface missiles. Eventually, Israel developed an advanced type of this design in its own Haifa shipyards. By 1993, the navy was estimated to have 12,402 units, including submarines. By 2004, Israel had guaranteed the regional superiority of its navy by acquiring German submarines of the Dolphin type, equipped with nuclear cruise missiles.

Thus, while the Israeli IDF suffer from a dramatic negative quantitative comparison with the standing armies of the surrounding Arab countries, even when all the reserve units are mobilized, Israel continues to enjoy a decisive qualitative edge when it comes to the total effectiveness of its units. Israel's limited territorial depth made it vulnerable prior to the acquisition of Sinai, the Golan Heights, and the West Bank in the 1967 war. Although much ameliorated, this vulnerability continues to be addressed through a strong and extensive early-warning system. Israel's dependence on a vast army of reservists and its frequent lengthy mobilization of manpower and civilian transport vehicles often resulted in severe economic disruption. This was the case prior to the 1967 war, when a month-long period of mobilization along all fronts aggravated the political crisis, leading to a preemptive attack against all surrounding Arab air bases.

DOCTRINE, STRATEGY, AND TACTICS

Israel's military doctrine has changed over the years but has remained based on the principle of military and psychological deterrence. This doctrine was intended to discourage attacks on Israel's population centers or on its vital strategic assets, such as its nuclear reactors. Because of its lack of strategic depth prior to 1967, Israel always felt justified in launching preemptive attacks. Known as the "operational plan," this doctrine called for delivering simultaneous offensive attacks against all of its neighboring Arab airfields. These strikes depended greatly on reports by military intelligence and its policy recommendations, as well as on a variety of intelligence sources and on coordinating with all branches of the military services. Because of the IDF's numerical inferiority when compared to the total strength of surrounding Arab armies, they enjoy a qualitative edge

in terms of air power and the speed with which they can carry out a mission. Israel relies heavily on an early-warning system based on the work of military intelligence.

Israel's faith in its own strategic doctrine changed as a result of its 1967 occupation of the West Bank and Gaza, home to large Palestinian populations who therefore became subject to Israeli control. Since Israel's armed forces are made up largely of ordinary citizens serving as reservists, they easily became highly sensitive to psychological pressures resulting from a permanent military occupation of a densely populated territory. More and more Israelis expressed a reluctance to function as an occupation army charged with containing a civilian population. The reputation of the military institution was tarnished as a result of its failure to deliver a decisive blow to Hezbollah's forces in southern Lebanon. Israel's previous vocalization of potentially targeting the Jordanian territory in case of an imminent attack from the east was relinquished after the signing of the Israeli-Jordanian peace agreement in 1994. The same strategic shift occurred as a result of relinquishing control over Sinai in the Camp David Accords (1978). By 2010, Israel found itself on the horns of a dilemma, being forced to develop a new strategic doctrine while a solution for the Palestinian issue remained as elusive as ever.

Getty Images

Israeli paratroopers stand ready to shoot Hamas militants in the Gaza Strip in January, 2009.

A new challenge to Israel's nuclear hegemony in the Middle East materialized when Iran began developing its own nuclear capability. When Egypt and the United States attempted to persuade Israel to give up its nuclear weapons as an attempt to solidify the Camp David peace treaty, Israel refused to do so until every Arab state in the area signed a similar treaty with Israel. By the late 1970's, Israel had finalized the so-called Begin Doctrine, which reflected the views of Prime Minister Begin and his stance during these negotiations. It was there that he announced Israel's determination to resist any effort to develop a rival nuclear power in the region. Any such nuclear state would be considered a threat to Israel's security and must be forced to dismantle such weapons. Israel's 1981 attack on the Osirak reactor in Iraq was the first response to such a threat, an attack that was severely criticized by the U.N. Security Council. How far Israel would go in order to replicate its attack on the Iraqi reactor vis-à-vis Iran remained unclear, but it was clear that Israel had decided to enforce a wide territorial doctrine when it came to this type of weapon. Such a situation was averted during Prime Minister David Ben-Gurion's years in office (1955-1963), when he sought to cultivate close relationships with countries, such as Turkey and Iran, lying within Israel's outer rim.

The removal of the shah of Iran, Mohammad Reza Shah Pahlavi, from office in 1979 and his replacement with a radical Islamic regime at odds with Israel's claims of nuclear monopoly in the Middle East posed new threats to the entire region. The danger of instigating a nuclear duel between Israel and its challengers became real. In 2008, it was revealed that Israel's air force had been practicing to mount a strike on the Iranian reactor and Iran had test-fired a new missile capable of reaching Israel. These Israeli maneuvers were reminiscent of the building of a model

of the Osirak reactor in Israel in order to practice mounting a strike against it. Any such attack on Iran's nuclear reactor was expected to come in the form of serial bombings, which would provide ample opportunity for Iranian retaliation.

Even though a nuclear attack against Egypt's most vulnerable strategic asset, the Aswan Dam, was averted by the signing of the Camp David agreement and these two countries' adherence to their international obligations, by 2010 it seemed that Israel had used uranium-based weapons in some of its recent wars. It is known that Israel has used weapons (such as American "buster bombs," which were dropped on Hezbollah's offices in Beirut in the 2006 campaign) proscribed by the third protocol of the Geneva Conventions. Both the United States and Israel have declined to sign these conventions. Cluster bombs and phosphorus bombs were used in the 2008 attack on Gaza. The British scientific secretary of the European Committee on Radiation Risk, Christopher Busby, concluded upon testing soil samples that Israel during the 2006 Lebanese campaign must have used a new weapon with a nuclear fission device or a bunker-busting uranium penetrator weapon. The latter may have used enriched uranium, rather than depleted uranium. The Israelis continued to argue, however, that the Geneva Conventions did not cover many of these nuclear waste weapons.

CONTEMPORARY SOURCES

As the field is a relatively current one, there is much in the way of archival, firsthand material on the history of the Israeli military. Much information on the early wars surrounding the founding of the state of Israel is available in the David Ben-Gurion Archive, held at the Ben-Gurion University of the Negev's Sede Boker campus. The archive contains not only Ben-Gurion's personal papers and speeches, but also the minutes of meetings and other documents produced by Israel's first prime minister. In addition, the Israel State Archives in Jerusalem holds its record groups 72 and 153, which contain the private papers of many prominent Israeli politicians and government officials.

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Ghada Talhami

The Cold War
The Nonaligned States
Dates: Since 1955

Political Considerations

The term "nonaligned states" refers to those nations that attempted to stake out independent positions between the American- and Soviet-led power blocs in the international politics of the Cold War. A seminal event in the collective history of these states was the Asian-African Conference held in Bandung, Indonesia, in April, 1955; the nations attending this conference adopted a declaration promoting world peace and cooperation and expressing their desire not to become involved in the Cold War.

The ideals of peace, cooperation, and independence in international affairs became the founding principles of the Non-Aligned Movement (NAM), which was established in Belgrade, Yugoslavia, in 1961. This organization was largely the brainchild of Egyptian president Gamal Abdel Nasser (1918-1970), Indian prime minister Jawaharlal Nehru (1889-1964), and Yugoslavian president Tito (Josip Broz, 1892-1980). NAM was intended to form the basis of an alliance as close as that of the North Atlantic Treaty Organization (NATO) or the Warsaw Pact, but it demonstrated little of the same cohesion. Some member states became involved in armed conflicts with other members during the Cold War period, most notably India and Pakistan (1965 and 1971).

Despite the stated aims of noninvolvement in the geopolitics of the Cold War, regional or global tensions, such as conflicts with neighboring states, have ultimately compelled many member states to demonstrate close ties to one or the other of the two superpowers throughout this period. Since the end of the Cold War in 1991, NAM has struggled to find international relevance. While Egypt and India remain member states, the states of the former Yugoslavia have expressed little interest in membership, electing instead to hold observer status in the organization.

Military Achievement

Throughout the period of the Cold War, the conflicts waged by the nonaligned states tended to evolve from border disputes or displays of nationalism. Because the states involved in these conflicts found they could gain military advantage over their regional opponents through closer relations with one or the other of the two superpowers, these localized wars often threatened to spiral out of control and lead to much wider and deadlier conflicts.

In 1956, Nasser oversaw Egypt's nationalization of the Suez Canal, sparking an invasion by a joint Israeli, British, and French task force to compel the Egyptian government to relinquish control of the canal. Ten years later, he hatched a plot with neighboring Arab states to overrun Israel, resulting in the disastrous Six-Day War of June, 1967, and the Israeli occupation of Egypt's Sinai Peninsula. Finally, in October, 1973, Nasser's successor as Egyptian president, Anwar el-Sadat (1918-1981), launched a surprise attack against Israel to regain the Sinai Peninsula (the conflict camed to be called the October War or the Yom Kippur War). In 1956 and 1967, Nasser had been emboldened to act by his close ties with the Soviet Union, which had been arming and training Egypt's soldiers. In 1956, the U.S. government forced a cease-fire on the belligerents before the situation escalated and led to a confrontation between the Soviet Union and the Western powers that opposed Nasser. In 1973, the American and Soviet govern-

AP/Wide World Photos

Pakistani protesters burn effigies and flags outside the Indian embassy in Islamabad in January, 1997. The two countries' long-standing conflict was supported during the Cold War by the opposing superpowers.

ments both intervened to bring hostilities to an end and restore the regional balance of power.

In 1965, India went to war with neighboring Pakistan over the territory of Kashmir. The dispute dated back to 1947, when India won independence from Britain, at which time the partitioning of British India into the independent nations of India and Pakistan left the status of Kashmir unresolved. Hostilities opened on September 1, 1965. After the Indian army had made significant headway into Pakistan the war appeared headed for a stalemate, prompting the Soviet Union and the United States to intervene as peace brokers for India and Pakistan, respectively. Following the war, India developed close ties with the Soviet Union, culminating in the Indo-Soviet Treaty of Cooperation and Friendship to balance Pakistan's increased support from the United States. The two countries were at war again in 1971 over Pakistan's repression of members of the Bengali independence movement in East Pakistan. This time India won a decisive victory, resulting in the secession of East Pakistan, now Bangladesh, from Pakistan.

WEAPONS, UNIFORMS, AND ARMOR

Egypt, Yugoslavia, and India all came to rely heavily, although not exclusively, on the Soviet Union for their armaments during the Cold War. Much of the Egyptian military was equipped by the Soviet Union and Czechoslovakia until the 1980's. In 1955, the Egyptian air force consisted of MiG fighters, Ilyushin II-28 bombers and II-14 transports, and Yak-11 trainers accompanied by Czechoslova-

kian instructors. In the 1960's the Egyptian government introduced the Soviet-made MiG-21 into the Egyptian air force. The MiG-21 is a short-range interceptor with mach 2 capability. It has a delta-wing design, which allows for fast climbing but results in a rapid loss of speed on turning. During the Six-Day War, Egyptian ground forces included approximately ninety World War II-era Soviet T-34 tanks with 85-millimeter guns.

Throughout the 1960's the Yugoslav People's Army operated about one thousand Soviet T-54 and T-55 tanks. In the late 1970's, Yugoslavia obtained an additional seventy Soviet T-72's, followed by more than four hundred Yugoslav M-84's. The M-84 battle tank is a domestically manufactured and improved version of the T-72; improvements over the T-72 include a domestic fire control system, improved composite armor, and a 1,000-horsepower engine. The M-84 has a crew of three and is armed with a 2A46 125-millimeter smooth-bore cannon.

The principal fighter jets of the Yugoslav air force were also MiG-21 Interceptors. In addition, Yugoslavia relied on SOKO G-2 Galeb trainers, which were the first Yugoslav-made jet aircraft. The Galeb, a straight-wing aircraft powered by a Rolls-Royce Viper Mk 22-6 turbojet, was used primarily for combat training of Yugoslav military air force academy cadets.

During the 1960's, the bulk of India's tank complement consisted of older American-made M4 Sherman tanks and the British-made Centurion Mk7's. The Centurions, with their 105-millimeter guns, were particularly useful during the 1965 war between India and Pakistan. India's ground forces at that time also included French-made AMX-13's, Soviet-made PT-76's, and American-made M3 light tanks.

In 1974, India conducted an underground nuclear test, making it the first nonaligned nation to possess nuclear weapons. Despite criticism and international sanctions, India had refused to sign the Nuclear Non-Proliferation Treaty of 1968, arguing that the treaty was discriminatory because it allowed those countries that had acquired nuclear weapons prior to the agreement—the United States, the Soviet Union, Great Britain, France, and China—to retain their arsenals.

MILITARY ORGANIZATION

Prior to the dissolution of the nation of Yugoslavia in late 1991, the Yugoslavian military was the fourth strongest in Europe. The Yugoslav People's Army, which had its origins in the partisan movement of the Yugoslav People's Liberation War against the Nazi occupiers during World War II and was the principal military organization of the Socialist Federal Republic of Yugoslavia (1943-1992), comprised an army, navy, and air force. These three services were organized into four military regions: Belgrade, Zagreb, Skopje, and the Split naval region. The ground forces of the Yugoslav People's Army made up the bulk of the country's military forces and consisted of infantry, armor, artillery, and air defense as well as signal, engineering, and chemical defense corps. The Yugoslav air force was responsible for transport, reconnaissance, and the country's national air defense system. The backbone of the Yugoslav navy was the Adriatic Fleet, which was headquartered at Split. In 1992 the Yugoslav People's Army was dissolved along with the Socialist Federal Republic of Yugoslavia, as the newly independent republics adopted their own militaries.

The Indian armed forces consist of the three branches of army, navy and air force. The Indian army was formed soon after India achieved indepen-

TURNING POINTS

June 5, 1967	Israel launches surprise attack on Arab air forces, beginning the Six-Day War.
Oct. 21, 1967	Egypt sinks Israeli destroyer *Eilat* with a Soviet Styx cruise missile.
Oct. 6, 1973	Egypt launches air strike against Israel, beginning Arab-Israeli October War.
1979	The Iranian Revolution ends Iran's close military ties with the United States.

dence and retained most of the regiments of the British Indian army. Throughout the conflicts that India fought during the first half of the Cold War, coordination between the Indian air force and the Indian army was quite poor. For example, during the war between India and Pakistan in 1965, the Indian air force was used extensively, but it acted independently of the army, conducting raids deep into Pakistani territory in obsolete World War II-era aircraft that ultimately surrendered air superiority over the combat zones to the Pakistani air force. The primary mission of the Indian navy during that period was to patrol India's coast, but during the 1971 war with Pakistan the navy played a significant role in the bombing of the Karachi harbor.

The Egyptian military originally consisted of three branches: army, navy, and air force. Following the disastrous events of the Six-Day War, however, during which a surprise attack by the Israeli air force destroyed most of Egypt's planes on the ground, Egypt added a fourth service branch: the Egyptian Air Defense Command. It was patterned on the Soviet Union's antiaircraft defense branch and integrated all of Egypt's air defense capabilities, including antiaircraft guns, missile units, interceptor planes, and radar and warning installations.

DOCTRINE, STRATEGY, AND TACTICS

Since the Bandung Conference, the nonaligned states have articulated a commitment to world peace and stability, placing particular emphasis on disarmament. NAM has promoted international cooperation to ensure the collective security of all nations. Regional disputes and tensions between aligned and nonaligned states have sometimes jeopardized this multilateral approach to international relations. Therefore, throughout the Cold War the nonaligned states adopted more unilateral tactics to preserve their national security.

Throughout its postindependence existence, the Indian army has had the primary responsibilities of defending India from external aggression, maintaining peace and security within India, and patrolling the nation's borders. This translated into an aggressive forward policy adopted in 1959 regarding disputed border areas with China. According to this tactic, Indian border-patrol units continuously pushed their posts deeper into Chinese territory. When it was apparent that China was pursuing a similar tactic in India, the situation rapidly deteriorated until the two sides were at war in 1962. India's nuclear strategy, on the other hand, has been one of deterrence. It is governed by a doctrine of "no first use" against any other nuclear power and "no use" against any nonnuclear state.

Given Egypt's close connection to the Soviet Union, many of its military tactics were based on Soviet doctrine. For example, during the 1967 Six-Day War, the deployment of Egyptian ground forces in the Sinai reflected a Soviet defensive posture, where mobile armor units were placed at a strategic depth behind the infantry to provide a dynamic defense while the infantry units engaged in defensive battles. Following its defeat in that war, Egypt carried out a prolonged strategy of attrition against the Israeli air force. Two Egyptian aircraft would penetrate Israeli airspace to bait an Israeli response. When Israeli interceptors (usually four to eight) arrived to engage the Egyptian planes, they would be attacked from behind by an additional dozen Egyptian fighters that had been lying in wait well below Israeli radar.

The Yugoslav People's Army had an operational military doctrine based on a concept of total war called "total national defense." According to this doctrine, the People's Army assumed the role of defending the borders from any invaders long enough for the territorial defense forces to engage the enemy forces and begin wearing them down through partisan tactics. Under this concept the entire population was to participate in the war effort, including through armed resistance, armament production, and civil defense.

CONTEMPORARY SOURCES

Two important contemporary works provide valuable information on the nonaligned states as a whole. The first is George McTurnan Kahin's *The Asian-African Conference, Bandung, Indonesia, April 1955* (1956). This is a very accessible work that details the events that occurred during the 1955 Bandung Conference. The first half of the volume presents the author's account of the conference based on his own experiences as an observer at the open sessions, and the second half provides transcripts of the speeches delivered by key attendees as well as the conference's final communiqué. The second collection, *The Conference of Heads of State or Government of Non-aligned Countries* (1961), edited by Slobodan Vujović, contains speeches from the 1961 summit of nonaligned nations held in Belgrade, where NAM was established.

English versions of contemporary sources of the military affairs of the nonaligned states during the Cold War do not appear to be extensive. The Indian Ministry of External Affairs and the United Nations published a four-volume collection of some of the U.N. Security Council proceedings on the 1965 India-Pakistan conflict: *India-Pakistan Security Council Documents, September-December, 1965*. On the 1971 India-Pakistan conflict, a document collection titled *The Fourteen Day War* was published in 1972. Additionally, the heads of state of Yugoslavia, Egypt, and India left partial records of their respective nations' foreign policies during the Cold War. Regarding Yugoslavia, two works have been published that deal specifically with nonalignment: *Tito o nesvrstanosti* (1976; *Tito on Non-Alignment*, 1976) and *Govori Predsednika SFRJ Josipa Broza Tita na konferencijama nesvrstanih zemalja* (1979; *Tito and Non-Alignment: President Tito's Addresses at Conferences of Non-aligned Countries*, 1979). Nasser similarly documented his position in *President Gamal Abdel Nasser on Non-Alignment* (1964).

Nehru left several collections that outline India's diplomacy during the period of his leadership. These include a volume of speeches titled *India's Foreign Policy: Selected Speeches, September 1946-April 1961* (1961) along with two volumes that deal with his thoughts on India's relations with China in the lead up to and during the 1962 border war: *The Prime Minister on Sino-Indian Relations* (1961) and *Chinese Aggression in War and Peace: Letters of the Prime Minister of India* (1962). Finally, Nehru's daughter, Indira Gandhi, who was prime minister of India during the 1971 India-Pakistan conflict, published *Selected Speeches and Writings of Indira Gandhi: The Years of Endeavour, August 1969-August 1972* (1975).

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Geoff Stewart

Colonial Wars of Independence

Dates: 1935-1991

Political Considerations

In the late nineteenth century a combination of increasing European industrialization, expanding trade and finance from growth centers in North America and Western Europe, and developing technological advances in transportation and communications fostered a global expansion of the imperial powers' political and military domination. In Asia, China's military and industrial underdevelopment allowed Britain, France, the United States, and Japan to assert colonial control over such former Chinese tributary states as Burma (1824-1885), Indochina (1862-1895), and Taiwan (1895), while also creating neocolonial spheres of influence in Thailand (1896) and in China itself (1839-1945). The vast interior of Africa, meanwhile, was visited by semiofficial European explorers and missionaries and was conquered by European troops operating from coastal bases beginning in 1880. Earlier European coastal encroachments that facilitated the slave trade, such as those of Portugal, were expanded.

A European-based alliance system preserved international balances of power in Europe, Asia, and Africa until the start of World War I (1914-1918). After the war the victorious Allies awarded themselves control over former German and Ottoman possessions in Africa, Asia, and the Middle East. The anomalous position of the former German colony of South-West Africa, seized by South Africa during World War I, was resolved when, in 1920, the League of Nations made it a mandate territory of South Africa, to eventually be known as Namibia.

Although colonial powers had various purposes for waging colonial wars, they generally sought to extend or preserve a global presence unfettered by the geographic limitations of their metropolitan homelands. In the late twentieth century this impulse came into conflict both with evidence of the military vulnerability of the European powers, many of which suffered defeat during World War II (1939-1945), and with increasing demands for self-determination from colonized peoples. Against these currents Italy had tried reinventing itself as a great power by invading Ethiopia in 1935, hoping not only to create a new colony but also to redress an earlier embarrassing military defeat it had suffered in 1896. Japan's occupation of Chinese territory from 1931 to 1945 and of European colonies in the Southeast and Southwest Pacific from 1940 to 1945 during World War II exchanged one occupying power for another, fueling nationalist resolve and greatly complicating the efforts of British, French, and Dutch troops to reassert their colonial authority after Japan's defeat. In the postwar economy European powers needed the natural resources provided by the colonies, but they also struggled to recover their international prestige after the damage of World War II. The same factors, resources and prestige, were interpreted differently by other colonial powers. The United States rapidly agreed to Philippine independence, linking it to the American ideal of freedom by selecting July 4 as Philippine Independence Day in 1946. Between 1956 and 1975 Spain withdrew from virtually all its colonial territories without armed confrontation: Morocco in 1956; the Republic of Equatorial Guinea in 1968; and the Spanish Sahara in 1976. Belgium also relinquished direct political authority in the Congo (1960) and Rwanda (1962), but did so without assuring the emplacement of stable successor governments.

As time passed, the motives of colonial powers changed. In the 1950's Britain and France deployed troops to certain colonies to protect expatriates from violence launched by local nationalists and to preserve sufficient order to allow a smooth transition of authority to local elites sympathetic to the West. Portugal's calculus was different. It made its overseas

colonies provinces of the motherland and tenaciously defended its colonial system, particularly after the embarrassment caused by India's easy seizure of Portuguese Goa in 1961. Throughout the 1960's and 1970's Portugal used force to suppress independence movements in Guinea-Bissau, Mozambique, and Angola, with disastrous results.

Networks of anticolonial nationalists readily evolved, including the Pan-African Congress movement of the 1920's and 1930's, the Communist International movement of the 1930's and 1940's, and the Nonaligned Movement of the 1950's and 1960's. Through these and other initiatives, anticolonial insurgents gained international recognition and built political alliances. Meanwhile, nationalist leaders, who endorsed social changes such as land reform in addition to anticolonial causes, often conceived of their movements as "national liberation struggles." Of these, many included well-organized local Communist parties whose leaders studied the strategies developed and employed by Mao Zedong (Mao Tsetung; 1893-1976) in the Chinese Civil War (1926-1949). Material and political support from the Soviet Union and China bolstered anticolonial forces in several colonies. These facts greatly complicated the international context of many colonial wars, as East-West tensions became integrated with local colonial politics. Once local nationalists embarked upon an armed struggle, whatever its external orientation, colonial powers were loath to withdraw without first quashing the armed rebellion. Typically each side in the ensuing conflict interpreted the military activities of the other as an escalation of the conflict, and partisan support galvanized on each side as casualties and costs mounted.

For their part, local nationalists could not organize cohesive political, let alone military, opposition where some form of genuine antipathy to imperial rule did not already exist. Leaders sought to transform local dissatisfactions into an organized resistance movement through propaganda, recruitment, and political instruction. Leaders also carefully monitored East-West tensions and studied the progress of other anticolonial movements, looking for external support and examples of successful struggle strategies.

Transitions to independence typically required the complete military withdrawal of the colonial power. Metropolitan powers elected to withdraw for many reasons: the financial and other costs of long-lived colonial wars, as in the French withdrawal from Algeria in 1962; cataclysmic military defeat, as in the French disaster at Dien Bien Phu in 1954; the transfer of power to moderates after the defeat of insurgent forces, as in Malaya in 1957; the collapse of the metropolitan government, as in Portugal in 1974; and international isolation and condemnation, as in South Africa's withdrawal from Namibia in 1989. Although negotiations between colonial authorities and insurgent leaders gave the latter political legitimacy, anticolonial leadership structures often fractured after hostilities ended, plunging newly independent states into extended civil wars.

MILITARY ACHIEVEMENT

Although few colonial wars produced clear military results for either party, there are important examples of decisive battlefield victories that prefigured political change. Colonial powers thoroughly suppressed mid-twentieth century armed rebellions in both Madagascar and Malaya, allowing gradual transitions to independence in each case. Similarly, certain nationalist forces were able to force colonial administrations to withdraw after inflicting military defeat upon colonial troops. This occurred in Indochina, where Vietnamese forces engineered the collapse of the fortified French position at Dien Bien Phu and in Algeria, after a less disastrous but equally costly six-year conflict (1954-1962).

For both colonial and nationalist militaries, one of the great challenges of anticolonial conflict lay in asserting cohesive command over multinational and multicultural troops. Where anticolonial commanders failed in this project, as the Chinese-dominated Malayan Communist Party did, broad popular support proved elusive. Where they succeeded, as in ethnically diverse Guinea-Bissau under the political leadership of Amilcar Cabral (1921-1973), the shared experience of colonial occupation became a unifying factor that promoted nation-building. Colonial pow-

ers, on the other hand, routinely utilized troops and bureaucrats from other colonies in colonial wars. In Malaya, for example, the British used Gurkhas from India, whereas the French employed Moroccans in Indochina and Senegalese in Algeria. Coordination of these international forces underpinned cooperative bilateral relations between colonial powers and the donor colonies: India (1947), Morocco (1956), and Senegal (within the Federation of Mali, 1960) all achieved political independence with relatively little anticolonial violence.

Weapons, Uniforms, and Armor

In almost all colonial wars, nationalist forces initially armed themselves with crude weapons fashioned from local materials by local manufacturers. Knives, machetes, and small bombs filled with bits of wire or glass were devised for urban conflicts. In jungle and bush terrain camouflaged pits concealed sharpened *punji* sticks, often soaked in snake venom or human waste in order to inflict both injury and infection. Similarly, vines and jute laid across footpaths and in streams served as triggers for swinging spikes, bombs, and falling rocks or nets. Such traps were especially valuable because they required little matériel, could be constructed by noncombatants, and remained viable without maintenance.

In Southeast Asia arms stored by anti-Japanese guerrillas during World War II supplied anticolonial insurgents in the late 1940's. Weapons were also purchased in neutral Thailand and smuggled to insurgent units in unguarded coastal areas in Indochina, Malaya, and Indonesia. Later, more advanced armaments were captured from colonial forces and received from external allies. Colonial wars in central and sub-Saharan Africa in the 1950's were characterized by insurgents' use of antiquated and in some cases primitive weaponry, deployed against European forces wielding automatic guns, explosives, and aircraft. In Guinea-Bissau, for example, the earliest guerrilla units organized by the Partido Africano pela Independencia da Guinea-Bissau e Cabo Verde (PAIGC), or the African Party for the Independence of Guinea-Bissau and Cape Verde, were armed with traditional spears and shields, supplemented by stolen or smuggled handguns. Arms smuggling proliferated during the 1960's and increasingly included heavier weapons such as light artillery, mortars, and rocket launchers. In the 1970's superpower weapons deliveries to African fighters introduced greater weapons standardization. In Angola and Namibia, Soviet and Cuban military advisers oversaw combat operations, and in Indochina Soviet and Chinese advisers were sporadically present from the early 1950's until the early 1970's.

Anticolonial forces typically had greater difficulty obtaining ammunition for their varied weapons stock than in obtaining the guns themselves. As a result self-activating weapons such as explosives were particularly valued. Plastic explosives were preferred because of their stable state, easy detonation, and amenability to cutting and shaping to meet specific operational demands. Land mines were of similar utility because of their destructive capabilities against both personnel and vehicles. Lightweight shoulder-launched rockets were prized for their effectiveness against aircraft, particularly slow-moving helicopters.

Asian and African anticolonial forces' uniforms were seldom standardized but usually consisted of dark-colored cotton shirts, trousers, and rubber-soled shoes with cotton uppers, or sandals. Exceptionally, PAIGC forces in Guinea-Bissau in 1964 received shipments of lightweight khaki camouflage uniforms made of Chinese cotton sewn in Cuba. Colonial troops were universally better clothed and equipped that their anticolonial counterparts. Typical uniforms were European summer-weight issue, with mosquito netting, wide-brimmed cotton hats, and rubberized boots as appropriate for deployments into jungle, desert, or riverine environments. In Kenya white combatants blended into the local African population by staining their skin, wearing native dress, and adopting rebel practices such as oiling their skin with animal fat to avoid detection by tracking dogs. Elsewhere equipment innovations proved vital. In Malaya British paratroopers were regularly injured in treetop landings and in climbing to the jungle floor; new safety equipment was introduced to reduce the weight of jump kits, and in 1950 paratroopers were

issued newly developed abseil, or rappelling, devices.

Conventional equipment and weaponry found new uses in colonial wars, and new weapons were introduced. British troops used explosives and mechanical saws to prepare landing "pads" for helicopters, because drooping rotors and steep descent angles made extensive foliage removal essential. Airborne delivery of high explosives and new small fragmentation bombs was common. Napalm, or jellied petroleum, bombs were widely used in Indochina, Malaya, and Guinea-Bissau to attack villages and storehouses and to clear deep jungle growth. Airplanes and helicopters sprayed toxic defoliant chemicals to destroy jungle cover and food cultivation sites. Airplanes dropped whistles and bottles known as "screamers" in conjunction with resettlement programs to intimidate civilians without causing physical harm.

In 1950 helicopters were introduced by Britain in Malaya for troop transport, reconnaissance, and liaison where mountainous terrain interrupted wireless communications. Despite functional problems caused by heat, humidity, and high-altitude operations, the helicopter's utility was fully demonstrated in Malaya. Helicopters were used by the British in Cyprus and Kenya, by the French in Indochina and Algeria, and by the Portuguese in Guinea-Bissau, Mozambique, and Angola. In each case only colonial troops deployed helicopters, guaranteeing their forces important mobility, reconnaissance, and tactical advantages.

MILITARY ORGANIZATION

The maintenance of political control over armed activists was critical for the coherent management of independence movements. In Malaya, the Malayan Communist Party (MCP) controlled its guerrilla organization, the Malayan Races Liberation Army (MRLA), through a political commissariat attached to guerrilla units. Commissars were charged with assuring the political allegiance of armed units and transmitting political directives from the Communist leadership. A commissariat system was also established by the PAIGC within its military wing in Guinea-Bissau. There, however, commissars conducted political instruction and oversaw non-operational problems such as health care, literacy, and complaints within armed units.

Escalating levels of armed conflict required insurgent forces to broaden their recruitment efforts and adopt more complex organizational schemes. In Cyprus, the armed struggle of the Ethnikí Orgánosis Kypriakoú Agónos (EOKA), or National Organization of Cypriot Fighters, began with a handful of armed operatives trained by a single commander. As EOKA's goal of unifying Cyprus with Greece gained popularity, it formed auxiliary nonmilitary groups including a youth organization and civilian support networks, which in turn yielded new recruits for the armed struggle that began in 1955. The EOKA guerrilla organization itself developed cells with differentiated tasks including terrorist attacks, patrol ambushes, and assassinations. In Algeria refugees and political exiles throughout North Africa provided military recruits for the Front de Libération Nationale (FLN) or National Liberation Front. As armed units proliferated in the mid-1950's commanders organized geographical divisions, known as *wilayāhs*, within the guerrilla organization. When propaganda and persuasion failed to produce sufficient manpower for the expanding armed struggle in Mozambique, operatives of the Frente de Libertação de Moçambique (Frelimo), or Mozambique Liberation Front, initiated conscription campaigns; women as well as men were given weapons training and inducted into Frelimo-controlled military units.

Auxiliary noncombat organizations could play key roles in the success of guerrilla operations. In Malaya insurgent forces depended upon material support from a civilian network, the Min Yuen, or People's Movement, which provided food, clothing, medical supplies, cash, and local intelligence. The Min Yuen had its own comprehensive district and branch organizational scheme and functioned under the direction of the Malayan Communist Party, which also controlled the guerrilla forces. As Min Yuen networks became the targets of British counterinsurgency operations in 1952, many Min Yuen operatives took up arms, but they remained orga-

nizationally distinct from the movement's military wing.

Cohesive command systems were also crucial to the success of anticolonial armed struggles. Lack of central organization by insurgent forces in Madagascar allowed French troops to completely rout 4,000 anticolonial fighters in 1947. In contrast, in Southeast Asia relatively small nationalist forces based on well-organized guerrilla units active against the Japanese during World War II were able to conduct successful military operations for several years against British and Dutch main-force troops in Malaya (1948-1960) and Indonesia (1945-1948). In Malaya the MRLA was divided into eight regional commands with companies of from 50 to 80 fighters as the basic operational units. Smaller guerrilla cells known as Blood and Steel Corps conducted specialized intelligence, terrorist, and demolition operations.

A similarly organized insurgent force was developed by Algerian partisans. The armed struggle originated with the small Special Organization, a radical paramilitary wing of the nationalist Mouvement pour le Triomphe des Libertés Démocratiques (MTLD), or the Movement for the Triumph of Democratic Liberties. From this beginning the anticolonial insurgent force grew after 1954 into tens of thousands of fighters, but it retained its small-scale organizational model. The *ferka*, a unit of about thirty-five active combatants, remained the principal operational unit. In Guinea-Bissau in the mid-1960's PAIGC guerrillas were grouped into units of twenty-six men each, including a commander and a commissar. These units, operating in pairs, were deployed by regional military commanders who coordinated the activities of each pairing with those of others in the same region.

Some insurgent organizations developed larger armed units to confront colonial main-force troops. In response to the influx of thousands of Portuguese troops, the PAIGC in Guinea-Bissau reorganized its guerrilla fighters into main-force troops and created a system of regional "fronts," or interzonal command centers, to replace the small autonomous zones that had been previously occupied by its guerrillas in 1964. In Indochina in the late 1940's the Communist-led Viet Minh pursued a two-track program of force enlargement, building small guerrilla units in southern and central Vietnam and regular battalions in northern Vietnam.

The Mau Mau Rebellion (1952-1956) was organized against British rule in Kenya by the Kikuyu and Meru tribes, led by the Kikuyu Central Association (KCA). Mau Mau forces included two wings: large units operating under seven regional commands on

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Men suspected to be Mau Mau rebels are retained in a barbed-wire compound in Kenya, circa 1955.

AP/Wide World Photos

A Turkish army tank rolls through the Turkish section of Nicosia, Cyprus, in July, 1974, part of an invasion sparked by an abortive coup by supporters of union with Greece.

the coastal plan, and loosely organized bands of guerrillas operating in the forested foothills of Mount Kenya. Within one year of the arrival of British regular troops, the KCA launched a general offensive in the low country (1953). In a rare organizational innovation by colonial forces, the British military authorized the creation of special units of white Kenyan settlers known as pseudos, which included captured Mau Mau operatives and defectors. From them pseudos learned local techniques for tracking guerrilla fighters through the jungle, as well as the locations of rallying points and supply caches. The 1956 arrest of the elusive guerrilla commander Dedan Kimathi, which effectively terminated the Mau Mau Rebellion, was made by a pseudo unit. In general, however, colonial military commanders used standard troop configurations against anticolonial forces, relying on superior numbers, weapons, and the administrative tools of the colonial administration to counter armed rebels.

DOCTRINE, STRATEGY, AND TACTICS

In the pursuit of independence and self-government, anticolonial movements cultivated the support of the general populations. The KCA-led Mau Mau Rebellion, for example, exploited long-standing resentment about the British seizure of land from local people and its distribution to white settlers.

Such popular support was not always forthcoming. In Guinea-Bissau the PAIGC was led by formally educated civil servants with few links to the peasantry, yet its armed forces required food, equipment, shelter, and recruits from peasants to fight the Portuguese. PAIGC leaders looked to the Chinese Civil War for doctrinal direction, embracing Mao Zedong's prescriptions for the political mobilization of the peasantry and a rural-based revolutionary struggle. They also borrowed Mao's concept of a "people's war," in which all nationalist classes banded together against colonial occupation, making colonial rule too costly for the metropolitan power. These Maoist perspectives also shaped the anticolonial wars in Indonesia, Indochina, Malaya, Cyprus, Algeria, and Kenya. Colonial wars in Africa were also shaped by a widespread belief in Uhuru, a concept that combined pan-African unity and the political independence of the whole continent from European colonialism.

Most colonial wars began with a political decision by nationalist leaders to confront colonial power with local violence. Small-scale, low-intensity violence was then directed against targets of symbolic importance. As the metropolitan power responded, isolated instances of violence expanded into an insurgency, with more and better-armed guerrilla units operating over wider areas and attacking larger targets, often of administrative or military importance to colonial authorities. The transition to widespread insurgency often required new tactics to supplement the armed struggle. In Cyprus a broad program of boycotts and passive resistance to British authority developed under EOKA guidance. In both Guinea-Bissau and Kenya, tribal customs, such as the Kikuyu tribe's complex oath rituals, were incorporated into the nationalist forces' recruitment process. In the early 1970's small arms were distributed to the civilian population as part of Frelimo's popular mobilization effort to counter the Portuguese military's distribution of weapons to white settlers.

In certain independence struggles guerrilla warfare escalated into the deployment of conventional main-force units. In Indochina, for example, the use of regular infantry divisions in northern Vietnam in the early 1950's dominated the Communists' anticolonial military strategy, culminating in a series of positional battles against French troops and the surrender of the French redoubt of Dien Bien Phu. Vietnamese guerrilla forces in southern and central Vietnam remained relatively quiescent in favor of the main-force battles. The situation was reversed in Mozambique and Angola, where, under the guidance of Soviet and Cuban military advisers, anticolonial military organizations developed some main-force units that confronted Portuguese regulars, but small-scale guerrilla operations remained the primary engine of the insurgent movements.

Many anticolonial military organizations sought tactical advantages over metropolitan forces by utilizing military base areas located outside colonial borders, and thus beyond the operational theater of the colony itself. FLN forces in Algeria received weapons, supplies, and reinforcements from cross-border camps in Tunisia from 1956 to 1957. Frelimo forces from Mozambique operated bases in Tanzania. Angola's Movimento Popular de Libertação de Angola (MPLA), or Popular Movement for the Liberation of Angola, received aid from the Congo. In Namibia from 1966 to 1990 the South West Africa People's Organization (SWAPO) operated its guerrilla organization largely from bases in southern Angola.

Elsewhere guerrilla organizations made tactical decisions to concentrate their operations in terrain that offered them operational advantages over colonial regular forces. In Cyprus EOKA guerrillas concentrated in the mountains on the western end of the island, where British troops' mobility was impaired. In Malaya MRLA guerrillas retreated into deep mountainous jungle territory to avoid British air reconnaissance and "sweep" operations. Upland Mau Mau guerrillas led by Dedan Kimathi eluded British troops for years.

Colonial powers' military planning was influenced by such strategic concepts as the "domino theory," which posited that a Communist "takeover" of one colony would cause the successive collapse of other pro-Western governments in Asia and Africa. Thus for Britain to protect its naval facilities in Singapore it had to extinguish the insurgency in Malaya. The domino metaphor retained its cachet into the

1960's: To retain its access to Kuwaiti oil, Britain committed troops against insurrectionist tribesmen in Yemen from 1958 to 1961.

Colonial powers saw as a strategic imperative the separation of guerrilla forces from their civilian sources of supply. In Malaya British commanders implemented a "food denial" campaign that combined strict food rationing, identity registration, and air strikes against crop cultivation. Similar tactics were used in Kenya. Mass arrests, interrogations, and trials of suspected sympathizers were conducted in Indonesia, Malaya, Kenya, Algeria, and Cyprus.

"Area domination" also segregated insurgents from their civilian sources of food, supplies, and recruits. Troops and aircraft were used to clear known guerrilla strongholds, and a police presence was established. The British Briggs Plan (1950) in Malaya followed this approach, forcing MRLA units from the south to the north of the peninsula. In Kenya British troops established guerrilla-free "exclusion zones," creating mile-wide clearings that prevented insurgents from crossing and a 50-mile-long ditch around the foothills of Mount Kenya. In Algeria from 1954 to 1956 the French used "quadrillage" tactics, developing fortified areas free of insurgents.

Another common segregation tactic was population resettlement. As part of the Briggs Plan in Malaya civilians were forcibly removed from their villages and located in access-controlled "strategic hamlets." Similar projects were undertaken in Indochina, Guinea-Bissau, Kenya, and Algeria.

The elimination of cross-border bases was a key colonial military objective. In 1958 French forces in Algeria built a 200-mile-long controlled barrier, known as the Morice line, along the border with Tunisia to interdict the flow of weapons and reinforcements. The Morice line included electrified fences, machine gun nests, and land mines; it was patrolled by 80,000 French troops including mechanized units, armored trains, paratroopers, helicopters, and mobile infantry. In 1975 South African troops concentrated in northern Namibia to attack SWAPO bases in southern Angola and continued these military incursions until an international settlement was reached in 1989.

In deploying the helicopter in counterinsurgency warfare, colonial forces developed new troop movement and air-support tactics. Small payloads, slow airspeeds, and exposed fuel tanks made helicopters vulnerable to ground attack, and rapid approach and departure protocols were developed for battlefield landings. The helicopter was, however, the vehicle of choice for rapid troop deployments in difficult terrain. In one 14-day operation in Malaya in 1953, 415 helicopter sorties moved 1,600 troops and their equipment on counterinsurgency patrols through high-altitude jungle that prevented rapid deployment by foot.

CONTEMPORARY SOURCES

Most insurgent movements made extensive use of radio broadcasts to deliver political instructions, propaganda, and military directives. Many of the publicized analyses of anticolonial military campaigns produced by their leaders were prepared for use by other combatants, and thus were broadcast rather than printed for general circulation. An important exception to this rule was the promulgation by Abel Djassi, a pseudonym for Amilcar Cabral, the political leader of the anticolonial movement in Guinea-Bissau, of "The Facts About Portugal's African Colonies" (1960), a pamphlet that outlined nationalists' complaints about Portuguese political and military policies in their colonies. Djassi drew attention to the brutality of Portuguese colonial forces, and appealed to the United Nations for military assistance in restraining Portuguese troops in Guinea-Bissau.

General Georgios Grivas (1898-1974), leader of the Cypriot insurgency against the British, published a treatise on small unit tactics entitled "Agon EOKA kai Antartiopolemos: Politikostratiotike" (1962; "General Grivas on Guerrilla Warfare," 1965), in which he extolled the psychological and political uses of terrorist attacks on colonial targets. He endorsed the tac-

tic of drawing metropolitan forces into ambushes and unfamiliar terrain. He urged insurgents to wear down colonial forces' strength with hit-and-run attacks, which forced colonial forces to commit manpower to guarding potential targets. He encouraged military leaders to incorporate political activities into their tactical plans by coordinating guerrilla actions with protests and demonstrations by civilians.

Political leaders and other combatants have also published polemical tracts and memoirs on colonial warfare. Among polemicists, one of the most important was socialist lawyer and Indonesian nationalist Sutan Sjahrir (1909-1966), the principal negotiator with the Dutch (1946) and prime minister in the earliest Indonesian nationalist government (1945-1947). Sjahrir's tract entitled "Perdjuangan Kita" (1945; "Our Struggle," 1945), outlined the nationalists' political rationale for violent opposition to a return to Dutch colonial rule and the general strategy for postcolonial unification of the geographically dispersed islands of the Indonesian archipelago.

Participant memoirs of colonial warfare constitute a growing literature. Vietnamese Communist leader Hoàng Van Hoan's *Tsan Hai i Su* (1988; *A Drop in the Ocean: Hoàng Van Hoan's Revolutionary Reminiscences*, 1988) emphasizes the Communist Party's oversight and management of the anti-French conflict and reveals the importance of Chinese military assistance to the Communists' prosecution of the anti-French war. K'tut Tantri, a female resistance fighter and intelligence operative who fought against Japanese, British, and Dutch forces in Indonesia in the 1940's, described her experiences in her book *Revolt in Paradise: One Woman's Fight for Freedom in Indonesia* (1960).

Few journalistic accounts convey the full scope of anticolonial armed conflict, but the works of two exceptional reporters merit study. A French specialist on revolutionary warfare, Gerard Chaliand, published a firsthand account of PAIGC guerrillas' daily life and operational activities in *Lutte Armée en Afrique* (1969; *The Armed Struggle in Africa: With the Guerrillas in Portuguese Guinea*, 1969). The prolific journalist and former British intelligence officer Basil Davidson has produced a body of work detailing anticolonial warfare in Africa, including *In the Eye of the Storm: Angola's People* (1973), *The People's Cause: A History of Guerrillas in Africa* (1981), and *The Liberation of Guinea: Aspects of an African Revolution* (1969). The latter volume includes a foreword on revolutionary politics by PAIGC leader Amilcar Cabral, as well as detailed statements on political and military tactics by Cabral and by the Chinese-trained PAIGC commander in northern Guinea-Bissau, Osvaldo Vieira.

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Laura M. Calkins

Warfare in Vietnam

Dates: 1945-1975

Political Considerations

As the conclusion of World War II liberated Southeast Asia from Japanese domination, Indochinese Communist Party leader Ho Chi Minh (1890-1969) swiftly moved ahead with his political goal of a unified and independent Vietnam, proclaiming a Democratic Republic of Vietnam on September 2, 1945. At the same time, however, France began reasserting its colonial rule in Indochina. Ho, previously allied with the United States—especially through its Office of Strategic Services (OSS), the forerunner of the Central Intelligence Agency (CIA), against the Japanese, looked for support in his goal from the United States.

However, with a Cold War developing between the United States and the Soviet Union, U.S. president Harry S. Truman (1884-1972) chose not to risk a break with France and adopted a policy of what has been called "guarded neutrality." The United States accepted France's return to Indochina but required that aid to France not be used in Vietnam. As war in Korea threatened in 1950, the United States recognized the French-supported government of Emperor Bao Dai (1913-1997), the last emperor of the Nguyen Dynasty, and made available both economic aid and military supplies.

The Geneva Conference (1954), which ended the war between France and Ho's Viet Minh, called for a partition of Indochina into four countries—North Vietnam, South Vietnam, Laos, and Cambodia—and for an election no later than 1956 to unify the two Vietnams. The United States, however, assumed political control of South Vietnam from the French in 1955, when the American choice for president, Ngo Dinh Diem (1901-1963), replaced Bao Dai. Diem proclaimed the Republic of Vietnam, and both he and the United States refused to be bound by the call for a reunification election, knowing that the popular Ho Chi Minh would win.

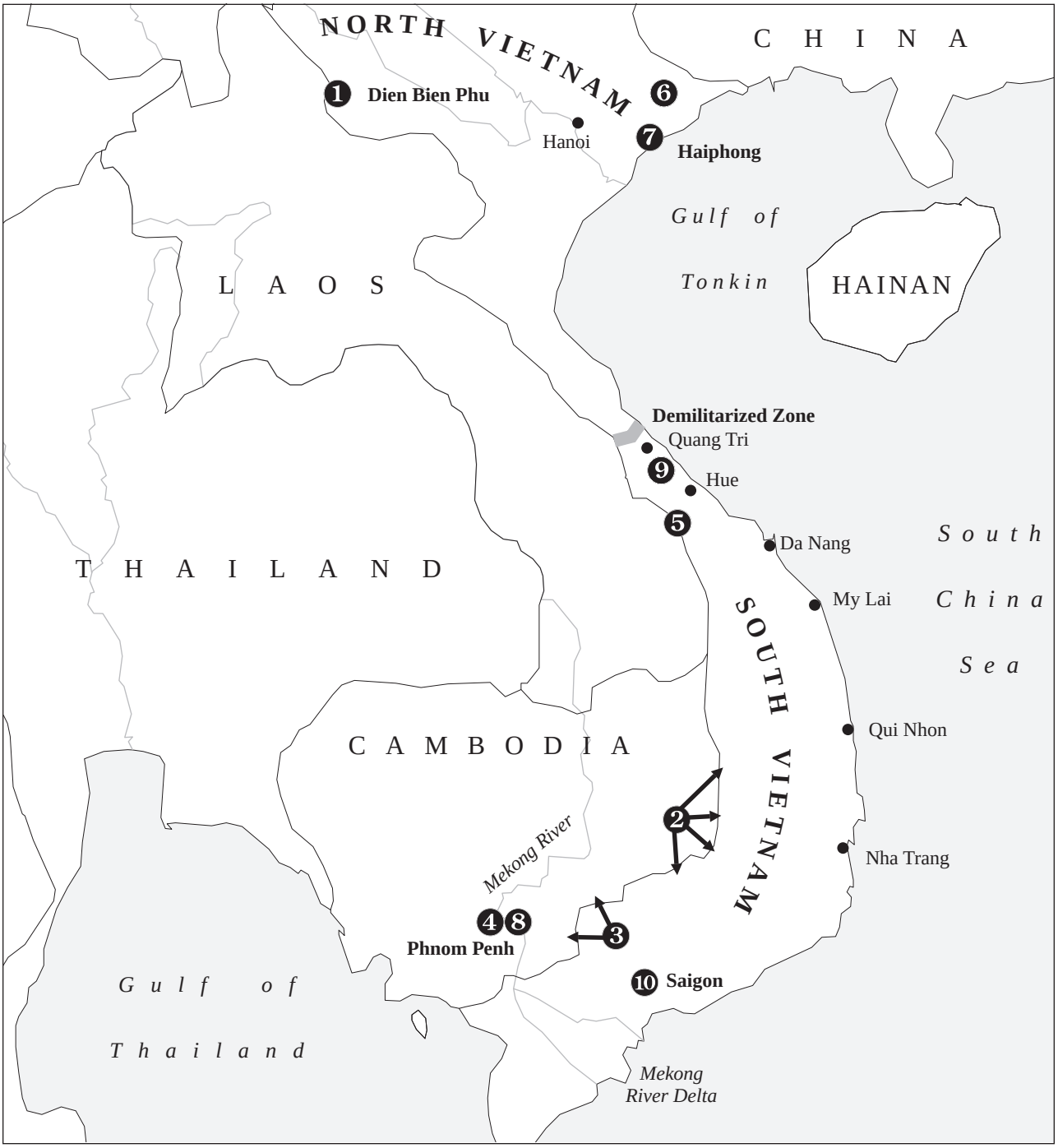
North Vietnam, determined to conquer the South, had the political, financial, and technological support of the Soviet Union and China. The South Vietnamese government sought, with the support of the United States, to maintain its rule in the South. The United States government feared a so-called "domino effect"; if South Vietnam fell to communism, it reasoned, so would other nations in Asia, including India. Both North and South Vietnam were now markers in the Cold War conflict between the three superpowers—the United States, the Soviet Union, and China. During its long struggle in Vietnam, the United States remained hampered by Cold War concerns and the desire to avoid pushing either of the other superpowers into active engagement in the fighting.

Military Achievement

The crushing defeat of the French at Dien Bien Phu in northern Vietnam in 1954 essentially brought the First Indochina War (1946-1954) to an end. However, Ho Chi Minh controlled only the northern half of Vietnam, and although the French had been forced out, the Americans had replaced them. Now the North Vietnamese turned their attention to undermining the South Vietnamese government and extracting such a high price for American involvement that the United States would withdraw.

The date often given for the beginning of the Second Indochina War, or what Americans call the Vietnam War, is 1956, the year in which the United States and Diem rejected the Geneva-mandated reunification elections. In 1959, North Vietnam's Central Executive Committee formally changed the country's approach from political to armed struggle. Remnants of the Viet Minh who had stayed in the South (the Viet Cong) were activated by the North Vietnamese Poliburo.

VIETNAM CONFLICT, 1954-1975



(1) France falls, 1954. (2) Tet Offensive, January, 1968. (3) Cambodian invasion, April-May, 1970. (4) Sihanouk falls, April, 1970. (5) Laotian incursion, February, 1971. (6) Areas of U.S. bombing, 1972. (7) Mining of Haiphong Harbor, May, 1972. (8) Lon Nol falls, April, 1975. (9) North Vietnamese offensive, spring, 1975. (10) South Vietnam surrenders, April 30, 1975.

The Viet Cong specialized in terrorist warfare against U.S. soldiers and South Vietnamese loyal to the Diem government. Their largest campaign was the Tet Offensive of 1968, which ended in the almost complete destruction of the Viet Cong infrastructure and the end of the Viet Cong as a significant military threat. From that point on, the war to unify the country was carried out primarily by traditionally organized North Vietnamese military forces.

U.S. president Richard M. Nixon (1913-1994), taking office in 1969, implemented the policy of Vietnamization, whereby the war effort would be turned over gradually to the South Vietnamese. The final American fighting forces withdrew from Vietnam in late March, 1973, following a January 27 peace agreement. The South Vietnamese were given some breathing room by many American victories, including the decimation of the Viet Cong forces and the disruption of Communist staging areas and transportation routes in Cambodia by means of a 1969 bombing (Operation Menu) and a 1970 invasion. Nonetheless, Saigon eventually fell, on April 30, 1975.

Weapons, Uniforms, and Armor

The French army in the First Indochina War was highly mechanized and had the support of such artillery pieces as 105-millimeter howitzers, 75-millimeter recoilless rifles, and heavy mortars. Quad-50 machine guns, consisting of four .50-caliber machine guns mounted together, were capable of great destruction. France also had fighters, fighter-bombers, and bombers, but only about one hundred planes all together. The Viet Minh began its military efforts against the French with a ragtag collection of arms given them by the United States during World War II or captured from the French. Land mines proved useful against the French, as they would later against the Americans.

As the Korean War (1950-1953) neared its end, arms and other equipment began to flow into North Vietnam from the Soviets and Chinese. Russian heavy-duty Molotova trucks proved invaluable for transporting arms and supplies. Russia provided rifles, machine guns, and a variety of heavier weapons, including 120-millimeter mortars, recoilless cannons, and bazookas.

Effective additions to Viet Minh uniforms were two large wire-mesh disks, one over the helmet, the other hanging from the back. The wire mesh was filled with foliage to hide the troops from both aerial and ground observation.

In the Second Indochina War, or the Vietnam War, the most powerful aerial weapon for the United States was the Air Force B-52 Stratofortress strategic bomber, modified to carry thirty tons of conventional bombs and with a range of 7,500 miles. Leading fighter-bombers were the Air Force F-105 Thunderchief and the Navy and Marine Corps A-4 Skyhawk. The top fighter plane was the F-4 Phantom, flown by the Air Force, Navy, and Marines. Napalm, a jellied gasoline, was widely employed by the United States and South Vietnam in aerial bombs. The South Vietnamese Air Force, trained and supplied by the U.S., flew F-5 Freedom Fighters and A-37 Dragonfly fighter-bombers.

The North Vietnamese essentially had no air force until the mid-1960's when China and the Soviet Union started supplying the North with MiG-15, MiG-17, MiG-19, and MiG-21 jet fighters.

The United States relied heavily on helicopters. The Huey utility helicopter (UH-1) was used to transport troops and supplies, evacuate wounded, and even attack the enemy when modified with heavy armaments. The primary attack helicopter was the AH-1 Cobra gunship, armed with a grenade launcher, machine guns, and rockets.

The U.S. Navy's Seventh Fleet deployed attack carrier strike forces consisting of carriers, cruisers, destroyers, and other vessels. American forces also had access to amphibious ships, swift inland boats to patrol rivers, and air-cushioned hovercraft (PACVs) and airboats for marshy areas.

U.S. artillery included 105-millimeter towed artillery, 105-millimeter and 155-millimeter self-propelled howitzers, 175-millimeter guns, and 8-inch howitzers. The portable, shoulder-fired M72 light antitank weapon (LAW) was used by Americans and South Vietnamese against tanks and bunkers. North Vietnam began to use medium and heavy artillery in the South during the 1970's. Their artillery pieces ul-

timately included 76-millimeter, 85-millimeter, 100-millimeter, 122-millimeter, and 130-millimeter guns and howitzers.

Communist forces in the South had only machine guns and rifles to use against planes early in the war but near the end had Soviet SA-7 antiaircraft missiles and Soviet SA-2 surface-to-air missiles (SAMs), the latter able to reach 85,000 feet. Another SAM, the Soviet SA-7, could be shoulder-fired.

Americans switched in 1967 from the heavy M-14 rifle to the lighter and shorter M-16, which used a smaller, 5.56-millimeter cartridge and could be fired either one shot at a time or fully automatically. The United States also armed the South Vietnamese with the new rifle. The most effective sniper weapon was a carefully modified version of the M-14, the M-14 National Match rifle (M-14NM) with the Limited War Laboratory's adjustable ranging telescope (ART), possessing a range of more than 1,000 yards. North Vietnamese and Viet Cong used the Soviet AK-47 rifle, which was similar to the M-16.

Less conventional weapons included mines and booby traps. The United States and its allies used the antipersonnel Claymore mine, which could be detonated at a distance by closing an electrical circuit, and also did extensive mining from the air. The Viet Cong made widespread use of booby traps, ranging from sharpened bamboo stakes called pungi stakes to a variety of mines including the Bouncing Betty, which would bounce into the air when triggered and explode around waist height.

NARA

U.S. F-105 Thunderchiefs drop bombs over Vietnam in 1966.

Military uniforms of generally standard types were worn by the regular forces. Although Viet Cong are associated with the black pajamas and sandals they sometimes wore in combat, they often mingled during the day with other South Vietnamese, wearing no uniform or other clothing that would set them apart.

Despite the often inhospitable terrain, the United States and South Vietnamese troops used tanks throughout the war, including the diesel-powered M48A3 Patton tank and the M42 Duster tank. North Vietnamese, beginning in 1968, utilized Soviet-made T-34, T-54, and T-59 medium tanks as well as PT-76 amphibious tanks.

The United States made wide use of armored personnel carriers (APCs), especially the M-113 APC. The APCs were often altered to carry weapons and other cargo as well as troops, and, with the addition of gun shields, extra armor, and machine guns, served as attack vehicles.

Turning Points

1945	As World War II concludes, Indochinese Communist Party leader Ho Chi Minh proclaims a Democratic Republic of Vietnam, and France begins reasserting its colonial rule in Indochina.
1954	The Geneva Conference calls for a partition of Indochina into four countries—North Vietnam, South Vietnam, Laos, and Cambodia—and for an election within two years to unify the two Vietnams.
1955	The United States assumes political control of South Vietnam from the French.
1956	The United States and the U.S.-backed South Vietnamese president, Ngo Dinh Diem, reject the Geneva-mandated reunification elections, knowing that the popular Ho Chi Minh would win.
1959	North Vietnam begins armed struggle against U.S. soldiers and South Vietnamese loyal to the Diem government.
June, 1961	Washington conferences lead to the assignment of training specialists and increased military funding for the South Vietnamese army.
Aug. 5, 1964	Tonkin Gulf Resolution by the U.S. Congress authorizes President Lyndon Johnson to "take all necessary measures . . . to prevent further aggression" by North Vietnam.
Mar. 2, 1965	Beginning of systematic U.S. bombing campaign (Operation Rolling Thunder) of North Vietnam.
1968	North Vietnamese and Viet Cong launch the Tet Offensive, which, although unsuccessful, contradicted U.S. reports that a decisive end to the war was near at hand.
1969	U.S. President Richard Nixon institutes "Vietnamization" policy designed to transfer military responsibilities gradually to the South Vietnamese government.
May-June, 1970	U.S. invasion of Cambodia in pursuit of North Vietnamese troops.
1973	The final American fighting forces withdraw from Vietnam in late March, following a January 27 peace agreement.
1975	Saigon finally falls to the North Vietnamese forces, and Vietnam is united under Communist rule.

Military Organization

Both the French and Communist forces used traditional patterns of organization such as battalions, regiments, and divisions. However, Viet Minh general Vo Nguyen Giap (born 1911) gave his commanders considerable flexibility regarding strategy and tactics, thus permitting quick decision-making. French control remained more centralized along World War II models to coordinate armor, infantry, airpower, and parachute drops.

During the Second Indochina War, or Vietnam War, American decision making was fragmented, split along various vectors that included the president of the United States as commander in chief, the secretary of defense, the joint chiefs of staff, and the commander in chief of the Pacific Command (CINCPAC), the latter stationed in Honolulu and responsible for prosecution of the war.

The United States/Vietnam-based command and control entity after 1962 was MACV (U.S. Military Assistance Command Vietnam). As a "subordinate unified command," MACV was required to seek approval from the Honolulu-based CINCPAC headquarters. Virtually all military control for the North Vietnamese was unified under Giap, who was a member of the ruling Politburo, minister of defense, and commander in chief of the armed forces. The United States divided South Vietnam into four tactical zones numbered, from north to south, I, II, III, and IV Corps. Air Force operations, except for Strategic Air Command B-52 actions, were carried out by the Seventh Air Force, with Naval operations conducted by the Seventh Fleet, both ultimately under CINCPAC.

The basic units of the U.S. Army were the squad, platoon, company, battalion, brigade, division, and corps, with minor differences in the Artillery and

Marine Corps. Below the Seventh Air Force in Vietnam was the 834th Air Division, divided into wings, squadrons, and flights. A flight included about five aircraft. Marine and Naval air units were similarly organized.

The South Vietnamese Armed Forces were organized largely in the image of the United States but under the South Vietnam National Armed Forces (SVNAF) Joint General Staff, which increasingly took direction from MACV. The South Vietnamese Regional Forces and Popular Forces, both civilian militias, also were under the Joint General Staff. The Civilian Irregular Defense Groups (CIDGs), primarily Montagnards, were trained and usually led by U.S. Army Special Forces.

The North Vietnamese and Viet Cong were organized generally along the same lines as the U.S. forces, starting with divisions but including regiments rather than brigades. The Viet Cong had a party secretary and various supply, social welfare, and propaganda units. After Tet, remaining Viet Cong were organized into cadres under North Vietnamese control.

DOCTRINE, STRATEGY, AND TACTICS

The primary doctrines that drove the First and Second Indochina Wars were colonialism, nationalism, communism, and democracy. At the conclusion of World War II, France sought to reestablish its colonial rule over Indochina. Ho Chi Minh, widely seen within his country and by the Americans as more of a nationalist than a communist, a perception the validity of which continues to be debated, sought to assert his vision of a unified and independent Vietnam. Ho's triumph over the French in 1954 removed one colonial ruler but failed to unite all of Vietnam.

The Second Indochina War, or the Vietnam War, achieved Ho's nationalist goal of unifying all of Vietnam, but as a Communist nation. The United States throughout adopted the moral high ground of eschewing colonial domination while attempting to help South Vietnam secure permanent freedom as a democratic state, thus containing the spread of communism. These basic tenants led, affected by a variety of misconceptions, to the strategies and tactics adopted by the various warring parties.

The French tried to fight a war of attrition, believing they could wear down the Viet Minh. The French implemented this strategy by constructing hundreds of forts and pillboxes in northern Vietnam, which the Viet Minh simply went around whenever they chose. The French finally decided to adopt a more active strategy, which included cutting supply lines and luring the enemy into face-to-face battles. In the climactic manifestation of this policy, the French began in November, 1953, to establish a "mooring point" for French troops in a valley in northwestern Vietnam near the village of Dien Bien Phu. There the French established a defense perimeter, built two landing strips, and sent out patrols to cut supply lines to the enemy forces in Laos and engage the enemy in direct combat. Giap used Russian-supplied trucks and large numbers of construction workers to enlarge a winding mountain road to permit transportation of heavy artillery into the surrounding mountains and began his assault on March 13, 1954. The battle, and effectively the war, ended on May 7.

The United States, during its Vietnam War, fused a war of attrition with both a limited war to contain communism and a misjudgment that the Viet Cong were engaged in an insurgency that could be opposed with counterinsurgency tactics. Because the United States never fully recognized that North Vietnam was the true enemy and that the Viet Cong were an arm of the North, its primary goals, which included supporting the South Vietnamese government and rooting out insurgent elements in the South, at best addressed only parts of the problem.

President Lyndon B. Johnson (1908-1973), given a free hand by the Gulf of Tonkin resolution (1964), began a steady buildup of American forces in Vietnam that numbered about 550,000 by 1968. The United States had thus abandoned its earlier advisory role and taken over primary direction and prosecution of the war.

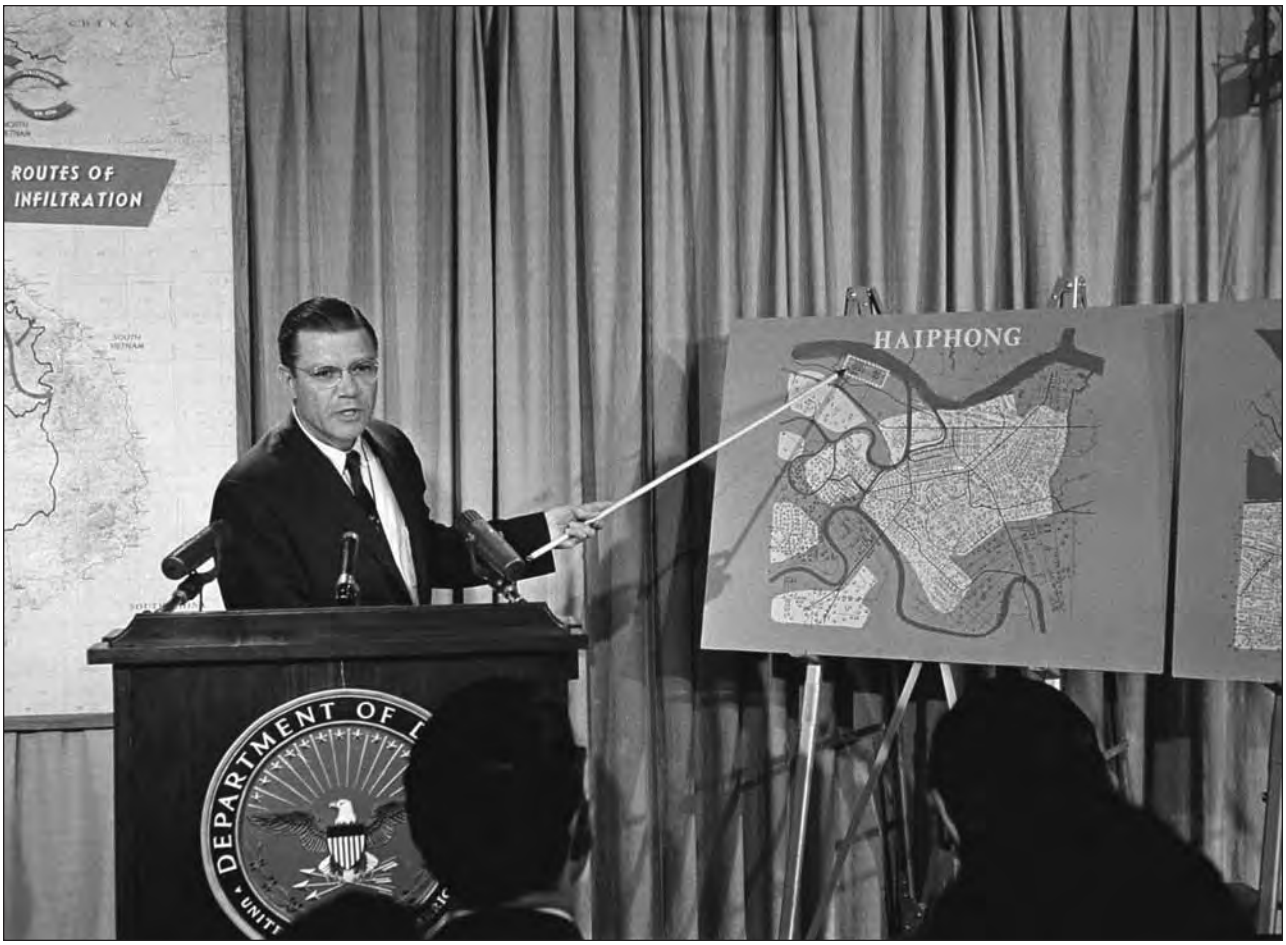
To weaken the enemy's resolve, the United States bombed the North in a campaign called Operation Rolling Thunder that lasted from 1965 until 1968. The bombing stopped in 1968 to encourage peace discussions but resumed in 1972 to push the Commu-

nists toward serious negotiations. The United States also steadily bombed the Ho Chi Minh Trail in fruitless efforts to halt infiltration of men and materials into the South.

Airpower never achieved the major goals the United States set for it, but it did help win many battles in the South with bombing and close support for ground operations. Helicopters proved extremely effective in transporting men and supplies and evacuating the wounded. In addition, the bombing of Cambodia in 1969 and 1970 bought time for the South Vietnamese armed forces to try to improve their war capabilities.

On the ground, American forces attempted to engage the enemy in direct combat operations, which first occurred in the fall of 1965 in the Ia Drang Valley. Like most such encounters, the short-term effect was a victory for the Americans.

Counterinsurgency tactics included such pacification efforts as educational, medical, and economic-development programs and search-and-destroy operations such as Cedar Falls (1967) and Junction City (1967) to deny the Viet Cong access to the countryside and its people. The hammer-and-anvil tactic caught Viet Cong between forces already in place (the anvil) and forces sweeping in from the sides (the hammer). These operations cleared the land for a time, but the Viet Cong inevitably moved back in.



AP/Wide World Photos

U.S. Secretary of Defense Robert S. McNamara discussing strikes on North Vietnam during a 1966 Pentagon news conference.

AP/Wide World Photos

A Vietnamese and a U.S. paratrooper drop from a helicopter during a battle with the Viet Cong. Helicopters were the key transport vehicles during the war.

As a guerrilla force, the Viet Cong used such tactics as mines and booby traps with deadly effectiveness. They dug elaborate tunnel complexes that served as supply depots, hiding areas for troops, even field hospitals.

The Tet Offensive of 1968 was the result of the change in strategy on the part of the North Vietnamese to a wider armed struggle. In cities, towns, and hamlets, North Vietnamese and Viet Cong launched attacks on January 31, during the Vietnamese Tet holiday. In all locations, the Communist forces were ultimately driven back. Although the Viet Cong suffered massive losses and ceased to be a major player in the war, Americans were unaware of the magnitude of their defeat. Instead, seeing attacks all across South Vietnam convinced Americans that the war was going badly. In 1969 President Nixon instituted a new strategy called Vietnamization, which meant getting the United States out of the war and turning the fighting over to the South Vietnamese.

With a plan to capture as much territory as possible before a final peace agreement, the North Vietnamese army launched attacks against provincial and district capitals throughout much of South Vietnam in the spring of 1972. Like Tet, the offensive was a military defeat for the North but a psychological victory, demonstrating how dependent the South Vietnamese were on U.S. support.

By 1975 the North Vietnamese army had twice as many tanks as did the South Vietnamese, and the more than 25,000 North Vietnamese troops in the Central Highlands were easily reinforced from the North. The U.S. failure to recognize North Vietnam as the central enemy had led to peace with the supply lines along the Ho Chi Minh Trail still functioning and the war production effort in the North unimpeded after 1973. The strategic definition of the war as counterinsurgency and the principle of containment, along with fear that movement of U.S. forces into the North might trigger a war between superpowers, meant there would be no invasion by U.S. forces. The United States had by

neither force nor negotiation been able to drive the Communists out of the South. The United States had the military might but not the strategy, and therefore not the tactics, to defeat the enemy.

With the expectation that the March, 1975, offensive would be both a prelude to a final triumph the following year and a test to see whether the United States would intervene, the North began its military push on March 11 with a victory at Ban Me Thuot in the Central Highlands. South Vietnamese president Nguyen Van Thieu (born 1923) decided to abandon the Central Highlands, and the North Vietnamese drove to the sea, cutting South Vietnam in half. The northern provinces fell, Thieu resigned on April 21, and on April 30, the new president, General Duong Van Minh (born 1916), surrendered.

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Americans would have better understood the enemy by examining a variety of books published by North Vietnamese, including General Vo Nguyen Giap, commander of the People's Army of Vietnam (1946-1972). He published a book on the battle that earned him lasting fame, *Dien Bien Phu* (1959; *Dien Bien Phu*, 1962).

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Edward J. Rielly

Warfare in Afghanistan
The Soviet-Afghan Conflict
Dates: 1979-1989

Political Considerations

The war in Afghanistan was the last major conflict of the twentieth century involving a superpower, the Soviet Union, and a regional actor, Afghanistan. The Soviet invasion of Afghanistan in 1979 was precipitated by a premeditated series of events that took place in Kabul and were rooted in the milieu of domestic Afghan politics. In the preceding years, following the coup d'état that had toppled President Mohammed Khan Daoud, the Khalq faction within the People's Democratic Party of Afghanistan (PDPA) seized power and began implementing sweeping reforms that included eradicating illiteracy, eliminating women's dowries, and changing the land tenure system, which alienated the traditional, conservative rural society where 90 percent of the population resided. The PDPA's reform program was hugely unpopular in the countryside.

A spontaneous rural insurgency followed, which the government was unable to control. Between July, 1978, and the autumn of 1979, the Afghan government lost two-thirds of Afghanistan. Complicating the situation was the murder of Soviet citizens in February, 1979, by angry mobs in Herāt. Then in March, 1979, the accession of Hafizullah Amin, also of the Khalq faction, to the post of prime minister marked a steady disintegration in the countryside that culminated in the September assassination of President Nur Mohammed Taraki by bodyguards of Amin, who then assumed the presidency. Amin was killed three months later, shortly after the invasion of the Soviet forces in December, and replaced by Barbak Karmal.

Two patterns emerged from the 1979 Soviet invasion. The first was the Soviets' lack of preparedness to fight, and the second was that their decision to invade was improvised and poorly conceived. Instead of gaining support for the moderate regime, the Soviets encountered a mounting backlash, as thousands of government soldiers and their officers defected to the Islamic guerrillas, or the Mujahideen, as they called themselves, seizing government outposts and their arsenals of weapons and ammunition.

The turning point in the Soviet invasion of Afghanistan came in 1986, when the Mujahideen began to receive large amounts of weapons and technical support through covert programs conducted by the U.S. Central Intelligence Agency (CIA). Mujahideen acquired Stinger surface-to-air missiles, 120-millimeter mortars, and communications equipment that allowed for the coordination of attacks on a broad scale.

Military Achievement

The military conflict in Afghanistan can be characterized as static, with the Soviets retaining control of the cities and towns and the transportation infrastructure, while the Mujahideen retained control of the countryside.

The Soviets established garrisons at strategic points, such as cities, villages, and valleys, from which the army could carry out offensives. Spetsnaz (special forces) units were dispatched into the Mujahideen-controlled countryside to gather intelligence, ambush Mujahideen guerrilla units, and create confusion and chaos among the populace. This tactic effectively divided the Afghan resistance and rendered the Mujahideen incapable of challenging the Soviet army. Even with the introduction of covert military aid from the CIA, the Mujahideen were incapable of sustaining prolonged attacks on Soviet positions.

TURNING POINTS

Apr. 27, 1978	Military officers sympathetic to the People's Democratic Party of Afghanistan (PDPA) overthrow President Mohammed Daoud, who is killed during a *coup d'état*.
Apr. 30, 1978	Nur Mohammad Turaki is appointed Chairman of the Revolutionary Government and Prime Minister.
Dec. 5, 1978	While in Moscow Nur Mohammad Turaki signs a treaty aligning Kabul with Moscow and setting the stage for later Soviet involvement in Afghanistan.
Dec. 27, 1979	Soviet forces enter Afghanistan ostensibly to overthrow the government of Prime Minister Hafizullah Amin and install a puppet government loyal to Moscow.
Jan. 9, 1980	President Babrak Karmal gives a press conference justifying Soviet intervention in Afghanistan.
Jan. 23, 1980	U.S. president Jimmy Carter declares that the United States will consider any threat against the Persian Gulf a threat against its vital interests and will react, if necessary, with military force.
Mar., 1981	Soviets launch their first well-planned offensive in Afghanistan.
Aug. 20, 1985	The Soviet-Afghan troops launch their second offensive of 1985.
July 28, 1986	Soviet leader Mikhail Gorbachev announces a limited withdrawal of Soviet troops from Afghanistan.
Autumn, 1986	Stinger missiles are first used by the Mujahideen to counter the Soviets' overwhelming air superiority.
Feb., 1989	The Afghan Interim Government (AIG) is established, and the Soviet Union completes its withdrawal from Afghanistan.
Oct., 1989	Soviet foreign minister Edvard Shevardnadze publicly condemns the 1979 Soviet invasion of Afghanistan.

WEAPONS, UNIFORMS, AND ARMOR

The Soviet army was ill-equipped for combat in Afghanistan. Although the Soviets had overwhelming military superiority, they were ill-suited for anti-insurgent warfare. In the air, the Soviets used MiG-23's and SU-24 fighter-bombers for carpet bombing and refined the use of the MI-24 helicopter gunship to support motorized rifle units. Troops were issued AK-47's and AK-74's, which were of little use against an invisible enemy.

Uniforms were bulky, clumsy, camouflage overalls. Soldiers were issued crudely made uniforms and greatcoats of khaki, grey, or brown. They carried no body armor but wore vintage 1940's-style steel helmets.

At the onset of the war in Afghanistan the Mujahideen used whatever weapons were available: AK-47's looted from police posts, British-style .303 Enfields, FN-FALS supplied by Pakistan, and leftovers from the colonial wars. Soon thereafter front-line units began to carry DShK machine guns, 82-millimeter mortars, grenade launchers, AK-47's, and AK-74's either looted or bought from government soldiers and garrisons. Then in 1985, the United States began to funnel SAM-7 surface-to-air missiles to the Mujahideen units. Unlike their Soviet counterparts, the Mujahideen boasted no uniform. They wore their traditional tunics and blended into the civilian population.

MILITARY ORGANIZATION

The Soviet military was a modern, centralized military structure, but in order to counter the resistance they encountered, the Soviets continually introduced changes in the size, equipment, and organizational structure of their forces. The occupational forces consisted of three motorized rifle divisions, two independent rifle brigades, one airborne division, one independent air brigade, and three Spetsnaz brigades. These Soviet units were deployed carrying their full equipment, including antitank weaponry and antiaircraft batteries, both of which were poorly geared toward anti-insurgency warfare.

Mujahideen units were organized along ethnic or tribal lines, which dictated the composition of the

guerrilla unit. Often the Mujahideen operated in small mobile units of ten to twenty men that lacked an overall command structure. Overall, the Mujahideen were a conglomeration of some three hundred guerrilla units operating in all twenty-eight provinces of Afghanistan.

Although some of the units were affiliated with political parties, the majority were led by autonomous local commanders. The guerrilla units themselves were composed of untrained, disorganized local recruits who were organized by *qawm*, or tribe, and thus limited to hit-and-run operations.

DOCTRINE, STRATEGY, AND TACTICS

The so-called Brezhnev Doctrine undergirded the Soviet invasion of Afghanistan, during which aiding "democratic" forces consolidated revolutionary gains threatened by "foreign supported subversion." The Soviets had developed the Brezhnev Doctrine as a means of maintaining and defending the Communist bloc countries against internal and external threats, thus reinforcing Soviet dominance over Warsaw Pact nations. The first test of the Brezhnev Doctrine had been the 1968 Soviet intervention in Czechoslovakia, where the Soviets had ruthlessly crushed the Prague Spring liberalization movement. Although Afghanistan was not a member of the Communist bloc, the Soviets justified their use of the Brezhnev Doctrine with a friendship agreement they had made with Afghanistan.

Unlike their Soviet counterparts, the Afghan Mujahideen did not have an overarching military doctrine on which to base their resistance. Historically, warfare was used to improve one's social standing vis-à-vis the other qawm.

Initial Soviet military strategy in Afghanistan was in line with traditional operational strategy: the rapid

AP/Wide World Photos

Mounted Afghan guerrillas ready for combat with Soviet and government forces in western Afghanistan, January, 1980.

deployment of large numbers of armor and troops was intended to strengthen Afghanistan's faltering government. Once the Soviets had become ensconced in the capital of Kabul, little thought was given to strategic and security concerns. Soviet strategy evolved to consolidate control over the country without long-term commitment. Soviet aircraft and heavy artillery would first lay down heavy bombardment, while helicopter transports ferried troops to nearby ridges where they would lay down covering fire. Tanks and combat vehicles could then plough through what was left of the villages.

Initial Soviet tactics, using ground forces supported by tanks, were similar to those used in the 1968 invasion of Czechoslovakia. Following initial consolidation in and around Kabul, the Soviets deployed motorized rifle units to support the Afghan army waging classic large-scale armored warfare.

The well-planned Soviet offensives deployed motorized rifle divisions that used tactics based on warfare in the European theater. These motorized rifle units suffered heavy casualties owing to their lack of training in mountain and counterinsurgency warfare.

Beginning in June, 1980, the Soviets changed their strategy from the centrally controlled high-intensity mechanized operations to antiguerrilla warfare. As Soviet tacticians realized they had to adapt to the geographic and topological conditions of Afghanistan, they reorganized the Red Army itself, sending home antiaircraft missile brigades and artillery brigades and combining army ground forces and supporting them with MI-24 helicopter gunships. They also realized the importance of airborne assaults and covering air support in mountain warfare.

Initially lacking a central command, the Mujahideen never had an overall anti-Soviet strategy, instead adopting localized hit-and-run tactics such as bombings, assassinations, and attacks on supply convoys and military barracks. Over time, the Mujahideen began developing a strategy to counter the Soviets' anti-insurgency measures, attacking isolated military garrisons. Mujahideen tactics were localized and hindered by the lack of communications, properly organized command structures, and clear orders.

CONTEMPORARY SOURCES

By all accounts the Soviet-Afghan War was particularly vicious in nature. Atrocities were committed by both sides. Alex Alexiev, in *Inside the Soviet Army in Afghanistan* (1988), chronicled the individual experiences of individual Soviet soldiers in Afghanistan. Svetlana Aleksievich wrote *Tsinkovye malchiki* (1991; *Zinky Boys: Soviet Voices from the Afghanistan War,* 1992), a harrowing account of the lives of men and women who lived and served in Afghanistan, many of whom carry deep psychological scars from the devastation they witnessed there. Artyom Borovik's *The Hidden War: A Russian Journalist's Account of the Soviet War in Afghanistan* (1990) is a journalistic account of the Soviet-Afghan War. Each book chronicles Afghanistan's deadly descent into near-anarchy, as each battle brought vicious reprisals against the enemy. The Soviets used the terror of carpet bombing and forced migration to depopulate entire villages in hopes of depriving the Mujahideen of their support. The Mujahideen were also guilty of wartime atrocities, as they often shot their Soviet prisoners.

Mujahideen also terrorized Soviet-controlled towns and villages, bombing and killing civilians. In the Soviet-Afghan conflict, the use of terror became the norm. Little has been written about the real victims of the war, the people of Afghanistan, who endured ten years of civil war and forced migration, as the Soviets depopulated huge areas of the countryside. Although, as in Rasul Bakhsh Rais's *War Without Winners: Afghanistan's Uncertain Transition After the Cold War* (1994), attempts have been made to examine the factors that account for the Afghan tragedy and the fragmentation of the country, until the people of Afghanistan can tell their own stories, the full scope and nature of the Soviet-Afghan War will not be known.

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Keith A. Leitich

WARFARE IN THE GLOBAL AGE

Warfare in Iraq

Dates: Since 1990

Political Considerations

Although conflict between Iraq and the United States and its allies did not begin until 1990, in order to understand the political situation that led to the conflict, it is necessary to start with a review of U.S.-Iraqi relations from 1980 to 1990. In 1979, a group of Islamist Iranian revolutionaries occupied the American embassy, taking fifty-three Americans hostage as a protest against U.S. support of the regime of Mohammad Reza Shah Pahlavi. In this pivotal episode in the history of U.S.-Iranian relations, the hostages were held for more than a year, through a failed U.S. rescue attempt, and released only after the intervention of Algeria just as President Ronald Reagan took office. As the Iranian hostage crisis wore on into 1980, American and Saudi leaders looked for a bulwark against the spread of Islamic revolution throughout the Middle East. The most likely candidate seemed to be Iraq, led by President Saddam Hussein. More than willing to invade Iran, Hussein quickly became an ally of the West, keeping both Iran and his own nation mired in an eight-year-long war of attrition.

By the end of the Iran-Iraq War in 1988, however, Hussein was embittered toward the Arab and American leaders, who he felt had led him into a self-defeating conflict. Additionally, he was particularly angry at Kuwait, his neighbor to the south, which he accused of slant drilling across the border into Iraqi oil fields and, at the same time, refusing to extend credit to Hussein's regime. U.S. ambassador April Glaspie's ambiguous response to Hussein's explanation of his frustration with Kuwait gave Hussein the impression that the United States would not oppose his planned invasion. He could not have been more wrong.

On August 2, 1990, Iraqi forces crossed the border into Kuwait, easily seizing control of the small nation. Within less than a week, the United States, led by President George H. W. Bush (the first Bush presidency), began Operation Desert Shield, massing troops in Saudi Arabia, ostensibly to prevent a further Iraqi invasion. The United Nations Security Council condemned Iraq's invasion, giving the American buildup international backing. By November, the U.N. Security Council had voted to place a deadline of January 15, 1991, on Iraq to remove all troops from Kuwait. After waiting one extra day, American forces, along with those of other allied countries, began the softening of Iraqi forces through a massive bombing campaign, and on February 24, 1991, Operation Desert Storm began when coalition ground forces engaged the Iraqis, beginning an extended period of conflict.

Military Achievement

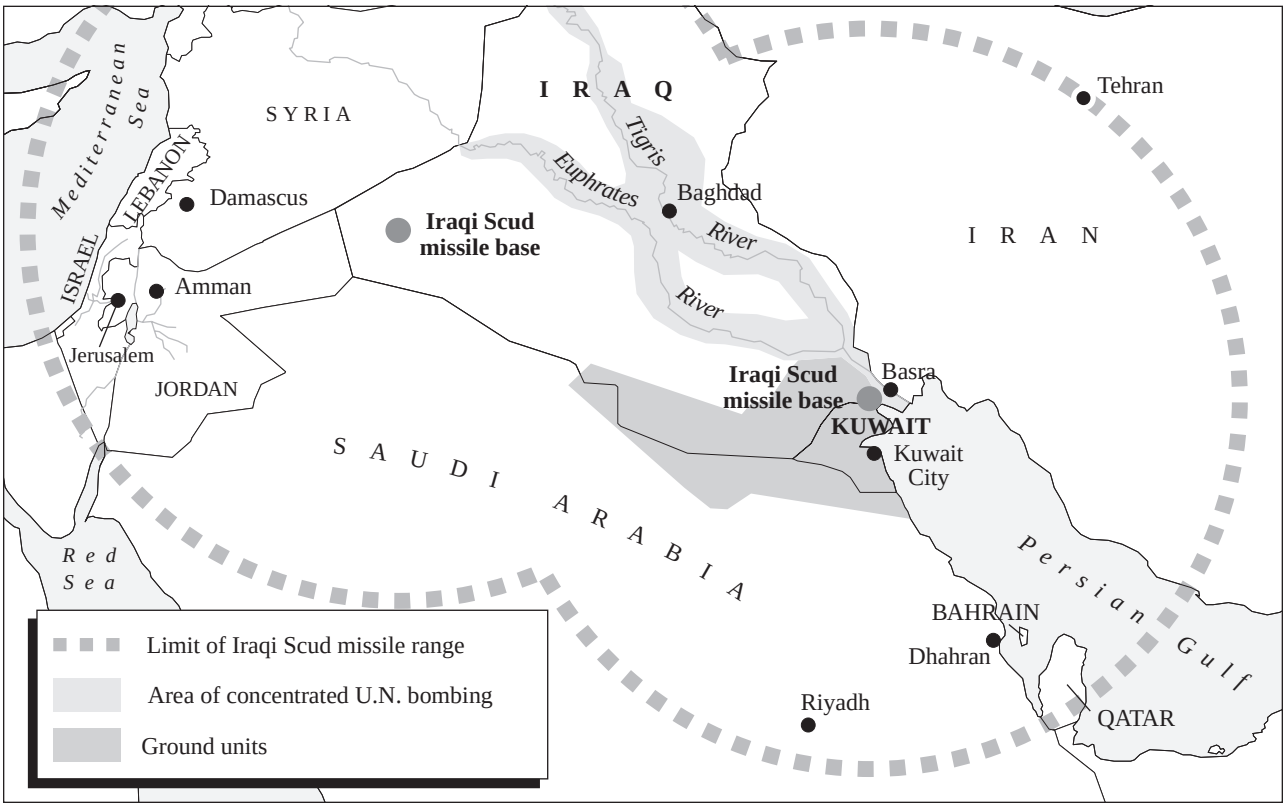
By the time Operation Desert Storm began, the United States was engaged in a "War on Terror," even though it was not yet called that. The holding of the fifty-three American hostages for 444 days in the U.S. embassy in Iran had turned the Middle East from a troubled but far-off region to a clear and present danger in the American mind. The 1983 bombing of the U.S. embassy in Beirut, Lebanon, and, later that same year in the same city, the deaths of 241 Marines in another bombing only intensified fears. Terrorist attacks, such as the 1988 bombing of Pan Am flight 103 over Lockerbie, Scotland, continued throughout the decade. These attacks were directed against the West and nationals from Arab states, such as Saudi Arabia and Kuwait, who were friendly with the West. When Hussein's attitudes toward the West changed during the late 1980's, he quickly went from being a friend of the United States to becoming an enemy, and he was consequently painted with the same brush as terrorist groups such as Hezbollah, Islamic

Jihad, Hamas, and the recently established al-Qaeda.

The stated primary goal of American actions in the Persian Gulf War (1991), the interwar period, and the Iraq War (beginning in 2003), was to limit Iraqi participation in the terrorists' *jihad*, or holy struggle, against the West, particularly the United States, Israel, and America's Arab allies. The immediate goal of the Persian Gulf War, as most of the American public understood it, was the removal of Hussein as a threat. However, the United Nations' mandate was only for the reestablishment of the status quo, that is, the removal of Iraq from Kuwait. By that limited definition of the Persian Gulf War's aim, the war was a success. However, if the Persian Gulf War is viewed as one incident in a larger War on Terror, with the longer-term goal of removing Hussein as a threat, the Persian Gulf War was a dismal failure, a failure that would haunt the rest of the first Bush presidency and impact the way his son, George W. Bush, would view the region during the second Bush presidency (2001-2009). As a part of the agreement that ended the Persian Gulf War, Hussein agreed to the presence of U.N. weapons inspectors and an American patrolled "no-fly zone" over much of Iraq. These measures placed the United States and the United Nations in Iraq for the long term, which only exacerbated anti-Western feeling both in Iraq and throughout the Middle East.

For much of the interwar period, the United Nations Special Commission on Iraq conducted no-notice inspections on sites throughout Iraq, uncovering clandestine programs to create weapons of mass destruction (WMDs). Though sporadic incidents of airborne conflict continued throughout the 1990's, it was not until after the terrorist attacks against the World Trade Center and the Pentagon on September 11, 2001, and the second Bush presidency that Iraq once again came to be seen as a primary threat in the

GULF WAR, 1991



War on Terror. Although the Central Intelligence Agency (CIA) repeatedly asserted that there was no connection between Iraq and al-Qaeda, the terrorist group headed by Osama Bin Laden that carried out the 9/11 attacks, the American people wanted someone to pay for the thousands of Americans who had died, and Iraq was a convenient and immediate target. Those who opposed the war speculated that the second conflict, known as the Iraq War, or Operation Iraqi Freedom, was more about finishing the job begun by the first President Bush and protecting American oil interests than actually fighting against world terrorism. The final assessment of the achievement of goals will have to wait until years after the Iraq War concludes, but members of the second Bush administration, notably Vice President Dick Cheney, have repeatedly asserted that the Iraq War, and the larger War on Terror, have been successes, as evidenced by the fact that there have been no further terrorist attacks on American soil after 9/11.

Weapons, Uniforms, and Armor

As warfare in Iraq has extended for twenty years, the number of different weapons used by Iraqi and coalition forces is vast and has evolved over the course of the conflict. However, two generalizations are possible. First, the Iraqi military, though the fourth largest standing army in the world in 1991, was using relatively outdated Soviet military hardware. Second, and this flows from the first, the United States and its allies enjoyed overwhelming superiority in terms of both the number and quality of its weapons.

Listing the staples of Iraqi weaponry is relatively simple. The main infantry rifle was the Soviet-made AK-47. The primary tank fielded was the Soviet T-72, which was introduced in 1974. Though vastly outnumbered by American air forces, the Iraqi Air Force utilized a number of Soviet aircraft, including the MiG-21, MiG-23, MiG-25, and MiG-29. However, the best-known Iraqi weapon of the Persian Gulf War has to be the SS-1 Scud missile. Though few in number and relatively inaccurate, these Scuds were used by the Iraqis to strike terror into Israeli and Saudi civilians, by firing a few missiles during the conflict, resulting in about thirty deaths. At the end of the first conflict, the weaponry allowed to what remained of the Iraqi military was severely curtailed. Almost all of the Scuds were destroyed, and the Iraqi Air Force basically ceased to exist. Therefore, by the beginning of the Iraq War in 2003, the Iraqi military was at an even greater disadvantage, while the American forces were even better equipped.

Although the coalition forces fielded a much wider variety of weapons, their workhorses are also easily listed. The infantry rifle used was the M16A2 semiautomatic rifle. The main battle tanks of the conflicts were the M1 and M1A1 Abrams tanks, though the venerable M60 Patton also saw action. In the air, the F-14, F-15, F-15E, F-16, and F/A-18S fighters saw heavy action in the first conflict, being joined by the F-117 Stealth fighter during the second. The Patriot and Tomahawk missiles were the weapons that struck fear into Iraqi civilians, as the Scuds did for the Saudis and Israelis. Among the vast numbers of weapons wielded by the West that the Iraqis did not have were the strategic bombers, including the B-52, B-1B, and B-2 Stealth bombers. The might of the U.S. Navy stood unchallenged by the few small Iraqi patrol boats.

Military Organization

During the Persian Gulf War, the command of the coalition forces was divided between the Western armies, under the leadership of U.S. general Norman Schwarzkopf, and allied Arab nations' forces, under the leadership of Saudi general Khaled Bin Sultan. This division was seen as necessary to avoid the perception that the offensive into Iraq was a case of a Western nation invading and occupying an Arab nation. The two separate commands coordinated very closely—thanks to the efforts of the Coalition Coordination, Communications, and Integration Center—and no problems arose because of the division. It was clear to all that Schwarzkopf had the final word. The Iraqis operated under a unified command structure with approval from Baghdad necessary for nearly every military action. The practical ramifications of

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M-1A1 Abrams tank in Iraq during Operation Desert Storm.

this were that when the United States began its bombing missions in anticipation of the invasion, the centers of authority for the Iraqi military were primary targets, which were hit with regularity. The ensuing confusion played directly into the coalition's hands. Although the Iraqi military was said to have been the fourth largest standing army in the world, it was an army that had recently finished a grueling eight-year war with its neighbor, Iran. Although it fielded sixty divisions, many units were undermanned and many commanders were inexperienced, due to Hussein's purges of military leaders. What did concern coalition leaders were the elite Republican Guard and other special forces units, who were battle-hardened.

The end of the Persian Gulf War, however, was not the end of conflict. The cease-fire agreement that ended the war called for Iraq to allow U.N. weapons inspectors to enforce a ban on offensive weapons systems and allowed the coalition air forces (those of the United States, the United Kingdom, and France) to enforce so-called no-fly zones over northern and southern Iraq. Although defeated in the Persian Gulf War, Iraq bristled under the restrictions and actively engaged coalition air forces with antiaircraft weapons. This situation continued, and began to intensify, in the months following the 9/11 attacks, eventually seeing Hussein expel U.N. weapons inspectors from the country.

The coalition put together for the Iraq War was much smaller than the broad, multination, U.N.-based coalition during the Persian Gulf War. Essentially consisting of the United States, the United Kingdom, Canada, and Australia, American primacy in the prosecution of the war was even more complete. General Tommy Franks, as head of U.S. Central Command (CENTCOM), the unified American command in charge of American interests in the countries of the Middle East, was the supreme commander as the United States invaded Iraq once again. If the command structure of the Iraqi military had been centralized during the Persian Gulf War, it was even more concentrated during the Iraq War. All Republican Guard and Special Republican Guard units reported directly to Hussein and his son Qusay. All key military posts were given to hand-picked, dedicated supporters of Hussein, so it is not a stretch to say that he exercised complete and nearly direct control over all military units in Iraq. Hussein's loyalists

manned all four Air Command Sector Operations Centers, which were set up to coordinate defense on a regional level.

Just as in the Persian Gulf War, the aerial bombardment of Iraq was effective, this time even more so as the technology behind the smart bombs had evolved dramatically during the twelve years between the conflicts. Though Iraq fielded a larger army and more tanks than did the coalition, Iraqi tanks were even more outdated and their army much more poorly trained and led. In addition, the superiority of American air forces was complete.

Doctrine, Strategy, and Tactics

A simple way of looking at the guiding doctrines of the three phases of the conflict is to look at the presidents who were commanders in chief at those times. President George H. W. Bush oversaw the Persian Gulf War, and his working with a large coalition to enforce a U.N. mandate fit with his overall way of pursuing foreign policy. President William J. Clinton governed during most of the interwar period, and his use of the no-fly zone rules and food-for-oil programs fits with his ideas of using less direct means of increasing diplomatic pressure on Saddam Hussein. George W. Bush became president about eight months before 9/11, and his Bush Doctrine of preemptive war guided the American buildup to and prosecution of the Iraq War.

The Western powers believed that the doctrine guiding Saddam Hussein's 1990 invasion of Kuwait was a desire to dominate the oil supply in the Persian Gulf. This, then, raised fears of a further invasion of Saudi Arabia, one of the nations Hussein blamed for goading him into the Iran-Iraq War. Further, by opposing the United States, Israel's most important ally, he hoped to take a leadership position in the Arab world. The U.S. doctrine going into the Persian Gulf War was simple. President Bush hoped to liberate Kuwait in fulfillment of the United Nations' mandate, defend the world's oil supply, and emasculate the Iraqi military's capabilities and pursuit of WMDs.

Whereas Iraq followed the strategy of an entrenched, defensive war, the coalition followed the strategy set out in the Army AirLand Battle Doctrine. This set out the idea that gaining and maintaining total air superiority and overwhelming, but carefully targeted, bombing were the keys to success. Hussein, for his part, did not believe that the bombing campaign would weaken his defenses significantly, and he did believe that the U.S. strategy would mean a long, costly land war, which he could either win or force into a stalemate. However, what he was not prepared for was a new generation of weapons that allowed the coalition forces to target military installations precisely and hit them with massive force. As former Air Force chief of staff Michael Dugan said: "Technology has caught up with doctrine."

During the interwar period, the U.S. strategy on the militarily diminished but not destroyed Iraq rested on two ideas: economic sanctions and the no-

U.S. Navy

Sailors aboard the USS Abraham Lincoln *in San Diego on May 2, 2003, announcing "Mission Accomplished" in Iraq. The war would actually continue for several more years.*

fly zones. President Clinton's goal was to diminish Hussein's influence in the region through diplomatic means and the threat of military force. Iraq was allowed to sell oil only to buy food, which was used as a means of keeping Iraq from recovering economically. As effective as that might have been, it was not the military in Iraq that suffered but the people. Hussein was able to rebuild his military capability, though not to the level he had in 1990. The army was approximately 40 percent smaller. The same tanks he had in 1990 were fewer in number and twelve years older. His air force was practically nonexistent.

As George W. Bush took office in 2001, Iraq already occupied a prominent place on his agenda. Though Iraq was diminished, the Bush administration feared that Hussein was succeeding in acquiring weapons of mass destruction that could be launched against Saudi Arabia or, worse yet, Israel. When the 9/11 attacks happened, Bush administration officials immediately attached their agenda on Iraq to the newly declared War on Terror. Though there was no evidence that Iraq played any role in fomenting or supporting the attacks, Vice President Cheney and Defense Secretary Donald Rumsfeld led a massive public opinion campaign to transform the resurgence in patriotism spurred by 9/11 into support for a war in Iraq. Ignoring world opinion and leading a small coalition consisting of only America's closest allies, U.S. forces under the command of General Tommy Franks quickly defeated the Iraqi army, leading Bush to declare, infamously, "Mission accomplished."

Of course, the mission was not accomplished but was just beginning, as the Iraq War went from a conflict between the American and Iraqi military forces to a long, bloody insurgent war, much more reminiscent of Vietnam than any other conflict in which the United States had engaged since. As the war became increasingly unpopular with the American public, a new strategy known as the "surge" was implemented in January, 2007, serendipitously coinciding with what would become known as the Anbar Awakening: a Sunni revival movement that sought to expose Shia insurgents. An additional 29,000 American troops were deployed, mostly in Baghdad, and violence declined, although American public opinion remained strongly opposed to the war, as the presidential election of 2008 demonstrated.

Antiwar feeling certainly contributed to Barack Obama's victory, as he promised to bring the troops home within eighteen months. However, even before he took office, the Bush administration began to draw back the number of troops in Iraq, in many cases redirecting them to the growing conflict in Afghanistan. Once in office, President Obama followed through on his campaign promise, implementing strategies designed to transfer responsibility for maintaining order in Iraq to the Iraqi military and police forces.

CONTEMPORARY SOURCES

Over the course of the interwar years, many of the policy makers and commanders during the Persian Gulf War wrote memoirs. A number of memoirs by the chief policy makers during the first Bush administration are among them, including Secretary of State James A. Baker III's *The Politics of Diplomacy: Revolution, War, and Peace, 1989-92* (New York: Putnam, 1995) and Joint Chiefs of Staff chairman Colin Powell's *My American Journey* (New York: Random House, 1995). Both the Western and Arab commanders during the conflict have written as well: H. Norman Schwarzkopf's *It Doesn't Take a Hero* (New York: Bantam, 1992) and Khaled Bin Sultan's *Desert Warrior* (New York: HarperCollins, 1995). Numerous assessments of the Persian Gulf War have also been published, including the House Armed Services Committee's *Defense for a New Era: Lessons of the Persian Gulf War* (Washington, D.C.: Government Printing Office, 1992). A good memoir of the interwar period was written by Hans Blix, the chief U.N. weapons inspector in Iraq: *Disarming Iraq* (New York: Pantheon, 2004). Over the course of both conflicts, numerous soldiers wrote accounts of their time in Iraq, and embedded journalists during the Iraq War also wrote extensively. There are not as many "insider" memoirs on the Iraq War, as the conflict is ongoing, though some hearings have proven fruitful for firsthand opin-

ions about the conflict. A prime example is a Senate Armed Services Committee hearing with the American commander Tommy R. Franks and Secretary of Defense Donald Rumsfeld, entitled *"Lessons Learned" During Operation Enduring Freedom in Afghanistan and Operation Iraqi Freedom, and Ongoing Operations in the United States Central Command Region* (Washington, D.C.: Government Printing Office, 2004).

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Steven L. Danver

Warfare in Afghanistan

The United States

Dates: Since 2001

Political Considerations

The attacks by al-Qaeda against the United States on September 11, 2001, led to the war in Afghanistan, also known as Operation Enduring Freedom. Since 1996, Osama Bin Laden had been granted sanctuary in Afghanistan by the Taliban, a militant Islamic group (led by Mullah Mohammad Omar) that seized power that same year. Because both al-Qaeda and the Taliban were hostile to the United States and the West, espousing a militant and violent interpretation of Islam, they quickly became allies. One month after the attacks of 9/11, the United States, Allied forces (primarily those of Britain), and anti-Taliban forces known as the Northern Alliance invaded Afghanistan with the stated aim of overthrowing the Taliban government and ending Afghanistan's role as a terrorist sanctuary for al-Qaeda. Suffering heavy casualties from U.S. and Allied air strikes and ground combat assault by U.S. and Allied special forces and Northern Alliance forces, al-Qaeda and Taliban forces retreated toward the eastern mountains of Afghanistan along the Pakistan border. Despite the swift collapse and defeat of the Taliban and al-Qaeda, Bin Laden and Mohammad Omar eluded capture or death, presumably fleeing during the December, 2001, Battle of Tora Bora into the lawless border areas of Pakistan (the North-West Frontier Province and Federally Administered Tribal Areas).

On December 20, 2001, the United Nations Security Council (UNSC) established the International Security Assistance Force (ISAF), led primarily by members of the North Atlantic Treaty Organization (NATO) but including nonmembers as well. ISAF was given the dual responsibility of assisting the United States in securing Afghanistan against al-Qaeda and the Taliban and also of promoting economic reconstruction of that devastated country after more than twenty years of civil war. ISAF was originally tasked with defending the capital city of Kabul and surrounding areas, but on October 13, 2003, the UNSC authorized ISAF to expand its presence throughout Afghanistan and in 2006 began to operate throughout the country. Until August, 2003, command of ISAF rotated among different nations on a six-month basis, but thereafter NATO assumed responsibility for appointing a commander, and ISAF was commanded by generals from Germany, Canada, Turkey, Italy, Britain, and the United States.

As of May, 2009, ISAF forces numbered more than 58,000 troops from forty-two different countries, including the United States, NATO-European countries, Australia, New Zealand, and Jordan. The ISAF force comprised 25,000 U.S. troops along with 30,000 troops from non-U.S./NATO countries. Another 17,000 U.S. troops operated independently of ISAF in training the Afghan National Army (ANA) and battling al-Qaeda and Taliban forces in eastern and southern Afghanistan along the lawless border regions of Pakistan used by al-Qaeda and the Taliban as a sanctuary. After the United States, Great Britain had the second largest presence in Afghanistan, with a total of 8,300 troops, the vast majority serving in Helmand Province, the heartland of the al-Qaeda and Taliban insurgency; Canada had 2,830 troops stationed in Kandahar—the former capital of the Taliban when it ruled Afghanistan—in the dangerous south; France had 2,800 troops deployed in Kabul; Germany had 3,500 troops stationed in the relatively peaceful north and northeast of the country; the Netherlands had almost 2,000 troops deployed in dangerous southern Afghanistan; and Italy had 2,350 troops in relatively peaceful western Afghanistan. A total of 159 British, 118 Canadian, 27 French, 31 German, 19

Dutch, and 14 Italian troops died in Afghanistan between 2001 and mid-2009.

The bulk of ISAF forces were in the insurgency-wracked south and east of the country, especially in the provinces of Helmand and Kandahar; elsewhere, ISAF troops were involved in peacekeeping and reconstruction instead of combat, according to the decisions of particular countries not to commit their forces to combat. By mid-2009, ISAF had deployed twenty-five provincial reconstruction teams to different parts of the country to rebuild damaged schools and hospitals and restore water supplies and damaged infrastructure in order to establish the conditions in which Afghans could enjoy a stable and inclusive democratic government to meet their needs and, in so doing, delegitimize and marginalize al-Qaeda and the Taliban. At the same time, however, continuing attacks by al-Qaeda and Taliban delayed progress in reconstruction. ISAF forces were also backed up by 80,000 troops of the Afghan National Army (ANA) and 30,000 Afghan policemen. The ANA conducted operations alongside U.S. and ISAF forces but were still unable to conduct combat operations independently, relying instead on Allied forces for logistics, artillery, and air support. In 2003, the Taliban and al-Qaeda had started regrouping and began launching attacks against U.S. and ISAF forces in Afghanistan.

The security situation worsened over the next five years, for a variety of reasons. First, the Afghan government of President Hamid Karzai remained weak, corrupt, and unable to govern effectively; its authority did not extend to large areas of the country and remained incapable of providing essential services to most of the people of Afghanistan. Second, as the security situation in Iraq dramatically improved in 2008-2009, al-Qaeda terrorists fled from Iraq to Afghanistan. Third, political instability and rising suicide bombings and attacks by al-Qaeda and the Taliban in Pakistan consumed that country and sapped its willingness to confront Taliban and al-Qaeda terrorists in Pakistan, leading to concern that Pakistan's pro-Western government might collapse as large parts of Pakistan remained under de facto control of al-Qaeda and Taliban militants.

On May 9, 2009, General David Petraeus, commander of U.S. forces in Iraq and Afghanistan, stated that Pakistan's lawless frontier border regions had become the headquarters of al-Qaeda's senior leadership, having displaced Afghanistan as al-Qaeda's main stronghold, and served as a sanctuary for the planning of attacks and for fund-raising and recruiting of members. Fourth, many Americans, including U.S. president Barack Obama, also attributed the deterioration of security in Afghanistan to the administration of President George W. Bush (2001-2009), which, by deciding that U.S. troops should invade Iraq in March, 2003, allegedly became distracted by that war, ignored Afghanistan, and failed to devote sufficient resources to the military effort there.

In any case, as American military deaths in Afghanistan rose in 2008 by 35 percent (to 155 soldiers killed) and were on track to exceed that rate in 2009, President Obama announced on March 27, 2009, that "urgent attention and swift action" were required because "the Taliban is resurgent in Afghanistan, and al-Qaeda . . . threatens America from its safe-haven along the Pakistani border." Pledging to "disrupt,

AP/Wide World Photos

Brigadier Tim Radford (right) speaks with the district governor in Gereshk, Afghanistan, in July, 2009.

dismantle, and defeat al-Qaeda and the Taliban," Obama dispatched an additional 17,000 combat troops to Afghanistan, as well as 4,000 military trainers from the Eighty-second Airborne Division to train that country's army—bringing the total number of U.S. troops in Afghanistan to some 60,000. Of these 17,000 additional troops, 10,000 were to be Marines stationed in the south; 3,800 were to be with an Army Stryker Brigade; 1,000 were to be Special Operations Force trainers; and 3,200 were to be force enablers.

MILITARY ACHIEVEMENT

After the defeat in Afghanistan of al-Qaeda and the Taliban in the fall of 2001, fighting continued on a sporadic basis, with occasional real battles, and control of the country largely reverted to the regional warlords who had held power before the Taliban. Britain, Canada, France, the Netherlands, and other NATO nations provided forces for various military, peacekeeping, and humanitarian operations. By the end of 2002, some stability, though tenuous, had been achieved in Afghanistan, but sporadic, generally small-scale fighting continued, particularly in the southeast, with the Taliban regaining some strength and even control in certain districts. In August, 2003, NATO assumed command of the international security force in the Kabul area. In early 2004, the United States and NATO both announced increases in the number of troops deployed in the country, and these increases continued into 2005. The U.S. troop increase coincided with new operations against an increasingly resurgent Taliban and al-Qaeda, and the spring of 2005 was marked by an increase in attacks by these militants.

Tensions with Pakistan escalated in early 2006, as members of the Afghan government increasingly accused Pakistan of failing to control Taliban and al-Qaeda camps in areas bordering Afghanistan; by the end of the year, President Karzai had accused elements of the Pakistani government of directly supporting the Taliban. In January, 2006, a U.S. air strike destroyed several houses in eastern Pakistan where al-Qaeda leaders were believed to be meeting. May saw the U.S.-led coalition launch its largest campaign against Taliban forces since 2001; some 11,000 troops undertook a summer offensive in four southern Afghan provinces where the Taliban had become stronger and more entrenched. In July, NATO assumed responsibility for peacekeeping in southern Afghanistan. NATO troops subsequently found themselves engaged in significant battles with the Taliban, particularly in Kandahar Province, the birthplace of the Taliban. NATO took command of all peacekeeping forces in the country, including some 11,000 U.S. troops, in October; some 13,000 U.S. troops remained part of Operation Enduring Freedom, assigned to fighting Taliban and al-Qaeda forces in the rugged mountainous areas bordering Pakistan. In the second half of 2006, as casualties mounted, NATO commanders encountered difficulties when their call for reinforcements failed to raise the necessary number of troops and resources. NATO leaders also joined Afghan leaders in criticizing Pakistan for failing to end al-Qaeda's and the Taliban's use of areas bordering Afghanistan, especially in Baluchistan, as safe havens. By the end of 2006, 98 U.S. soldiers and 93 Allied soldiers had been killed.

In March, 2007, NATO forces launched a new offensive in Helmand Province against the Taliban and al-Qaeda. Around the same time, Pakistan's construction of a fence along the border with Afghanistan led to protests from Afghanistan and sparked several border clashes between the forces of the two countries, as Afghanistan disputed the border with Pakistan. In May, NATO forces killed the top Taliban field commander, Mullah Dadullah, but Taliban forces mounted some guerrilla attacks as deep as the outskirts of the capital, Kabul, and in the north during 2007. Also in 2007 and particularly in 2008, as Afghanistan suffered the worst violence since the overthrow of the Taliban in 2001 with more than 4,000 killed—perhaps as many as one-third estimated to be civilians—Afghan civilian casualties during U.S. air strikes increasingly became a source of anger and concern among Afghans, which in turn not only put immense pressure on the Karzai government but also made it unpopular.

Afghan civilian casualties from U.S. air strikes continued to be a problem in 2008, straining relations

between Afghanistan and the United States. Significant fighting with insurgents continued through 2008, as the Taliban mounted some of their most devastating attacks ever. As the year progressed, U.S. forces mounted strikes against insurgent sanctuaries across the Pakistan border, leading to tensions with Pakistan. In April, President Karzai escaped an assassination attempt unhurt, and in July, he accused Pakistani agents of being behind insurgent attacks in Afghanistan, among them a suicide bombing of the Indian embassy in Kabul. By the end of 2008, 155 American and 139 Allied soldiers had died in combat that year, compared to 117 and 155, respectively, in 2007.

In 2009, as President Obama deployed additional U.S. troops to confront a resurgent al-Qaeda and Taliban, General Petraeus reported that these militants were planning a "surge" by moving weapons and forces into areas where the United States was adding troops. As the militants relocated across the border into Pakistan, the United States used unmanned Predator drones to fire missiles at dozens of militant targets inside Pakistan, killing several top al-Qaeda figures, but U.S. officials acknowledged that al-Qaeda's senior leadership had survived these attacks and that they continued to plot counterattacks, recruit fighters, and raise funds.

Al-Qaeda's resurgence in Pakistan, thus, posed a policy dilemma for the Obama administration: Pakistan's government would not allow U.S. military forces into that country, preventing the U.S. military from confronting these militants in ground combat to deny them sanctuary. Instead, without "boots on the ground," the United States was forced to strike either at targets from a distance (a tactic with limited military effect, even when it worked) or instead rely on Pakistan's military (which proved reluctant to venture into al-Qaeda's and the Taliban's sanctuaries). Pakistan's reluctance to confront al-Qaeda and the Taliban in its own country was said to stem from fear by the Pakistani government that this might lead to either (1) a collapse or even a mutiny among its military, which in addition to being trained to fight a conventional war against India was unwilling to confront its own Muslim countrymen, or (2) a civil war that could bring down the nuclear-armed Pakistani government. The Pakastani government seemingly alternated between trying to fight and trying to appease the militants. Indeed, in late April, 2009, while consolidating their control over two northwestern districts after Pakistan's government agreed to the Taliban's demand for Islamic law to be applied in the Swat valley, Taliban forces moved to within 60 miles of Pakistan's capital, Islamabad, before withdrawing. This move prompted Pakistan to launch a military offensive in the North-West Frontier Province, allegedly to rid the region of al-Qaeda and the Taliban; such operations in the past, however, had failed in their objectives.

After complaints in private failed to diminish or end the practice, President Karzai in 2009 demanded an end to U.S. air strikes in Afghanistan because of the allegedly high number of innocent civilians being killed. The U.S. and Allied forces, in turn, blamed the Taliban and al-Qaeda for hiding among innocent civilians and continued the air strikes.

American dead and casualties between 2001 and mid-2009 in Afghanistan were 610 killed and at least 2,766 injured. The total number of Allied casualties for that period was 452 dead. In April, 2009, six NATO soldiers, all Canadian, were killed in a roadside blast, bringing to 118 the total killed for Canadian troops alone. Although President Obama decided to send 17,000 more U.S. combat troops and 4,000 more training personnel, European NATO allies such as Britain, Canada, France, and Holland declined his request to send additional combat forces, although Australia announced it was deploying 450 additional troops to Afghanistan (bringing the total number of Australian troops to 1,550, of whom 10 had already died in the conflict). On Monday, May 11, as President Obama tried to turn around what by all accounts was a stalemated war, it was announced that he was replacing the top general in Afghanistan, David McKiernan, with Army Lieutenant General Stanley McChrystal. With national elections scheduled in Afghanistan for August, 2009, al-Qaeda and the Taliban were expected to continue and escalate their attacks.

Because al-Qaeda and the Taliban lack the firepower, particularly in terms of artillery and air power as well as night-vision equipment, of U.S. and Allied

forces, they generally avoid open and direct, prolonged engagements and prefer ambush, hit-and-run attacks, and suicide bombings to frustrate and demoralize their adversaries by denying them a decisive victory. These tactics significantly prolong the conflict and, in so doing, make the conflict seem endless and thus unwinnable. Based on events between 2006 and 2009, the militants had succeeded in turning the war in Afghanistan into a stalemate, with the momentum on their side.

WEAPONS, UNIFORMS, AND ARMOR

As al-Qaeda is a most unconventional "army," their weapons, uniforms, and armor are equally unconventional. Conventional arms have little place with al-Qaeda, because the movement's combatants do not participate in conventional attacks. Their weapons have run the gamut from car bombs, boat bombs, and bombs attached to suicide bombers to—in their most notable attacks, perpetrated in the United States on September 11, 2001—jet airliners used as massive bombs.

The Taliban, as a ruling authority for part of its existence, had the Afghan military at its disposal, but in more recent years it has become the province of local warlords, whose forces are neither organized nor standardized either in uniforms or in arms.

MILITARY ORGANIZATION

As it did in Iraq, the United States appointed one supreme commander for the Afghanistan theater. In May, 2009, Lieutenant General Stanley McChrystal took over for General David McKiernan as head of the nearly 30,000 U.S. troops in Afghanistan, headquartered at Bagram Air Base, Afghanistan. Reporting to the U.S. commander were the Combined Joint Task Force 101, which handled specific missions throughout Afghanistan, and the Combined Security Transition Command-Afghanistan, which worked directly with the Afghan National Army and the Afghan National Police to train them for an eventual takeover of security operations.

Under separate, NATO-led command were approximately 65,000 troops (including approximately an additional 30,000 U.S. troops, along with troops from Australia, Canada, the Czech Republic, Denmark, Estonia, France, Finland, Germany, Hungary, India, Italy, Latvia, the Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Spain, Turkey, and the United Kingdom), which form the ISAF. The ISAF was led by the Joint Force Command Brunssum in Brunssum, Netherlands. The ISAF commander reported to the Joint Force Command Brunssum and had five regional commanders who reported to him.

The opposing forces, usually given the umbrella term "Taliban," really were made up of several distinct groups, all fighting against the Afghan government and U.S. and NATO forces. The official Taliban leadership, headed by Mullah Omar, was strongest in the Kandahar and Helmand provinces. Some insurgent forces operated under the jurisdiction and with the approval of the Taliban central authority, but many acted independently of any authority and sometimes were no more than local criminal elements using the Taliban name as a means of legitimization.

DOCTRINE, STRATEGY, AND TACTICS

Al-Qaeda and the Taliban developed significant combat experience fighting the Soviet Union in Afghanistan from 1979 to 1989, and those experiences served as the basis for their insurgency campaign against U.S. and Allied forces, including NATO forces, in Afghanistan. Hit-and-run and ambush attacks, suicide attacks, and improvised explosive devices (IEDs) such as roadside bombs killed hundreds of American and Allied, including NATO, troops. In 2008, the U.S. military reported 3,800 suicide and roadside bomb attacks against Allied forces, killing 127 Allied troops, and in the first five months of 2009, there was a 25 percent increase in such attacks, killing a total of 53 U.S. and 52 Allied soldiers.

The terrain in Afghanistan is dotted with high mountains and deep valleys and caves, along with treacherous weather, especially in the winter. As a result, combat with al-Qaeda and the Taliban often oc-

AP/Wide World Photos

Blocks of TNT explosives used for improvised explosive devices (IEDs) and other weapons, confiscated from insurgents in August, 2009.

curred in close quarters in remote and inhospitable areas, undermining, if not negating, the effectiveness of armor, artillery, and even aerial firepower. In addition to difficult terrain, the lack of a national system of roads made travel exceedingly difficult; where roads existed, they were dirt roads. Compounding the problems faced by the United States and its allies was the issue of national identity among the Afghan people: Although al-Qaeda and the Taliban were not necessarily popular with most Afghans, their lack of a sense of national identity or unity and their tendency to see themselves instead as members of a tribe or clan made it difficult for the Afghan government to enjoy the support of either the people or local clans and tribes. Furthermore, the presence of a porous mountainous border with Pakistan to the east and the vast, essentially anarchic Pakistan border regions of the North-West Frontier Province and Federally Administered Tribal Areas, autonomous from Pakistani government control, gave al-Qaeda and the Taliban sanctuary.

President Obama continued the policy of the predecessor Bush administration of sending unmanned Predator drones to strike both along the Afghan-Pakistan border and inside both of these Pakistani provinces—much to the anger of local residents, who not only sympathized with (if not supported) al-Qaeda and the Taliban but also claimed that these strikes killed innocent civilians. The Pakistani government, too, objected to these strikes as a violation of its sovereignty, which also fanned anti-American sentiment.

Complicating the war in Afghanistan, the weak, corrupt, and unstable Pakistani government was paralyzed from both a series of political disputes and a surge of attacks and acts of terrorism by al-Qaeda and the Taliban. There was also much tension between the United States and its NATO allies regarding Afghanistan. The U.S. resented having to shoulder most of the military burden in Afghanistan and hoped Europe could do more to help in the fight against al-Qaeda and the Taliban. Except for the British, Canadians, and Dutch, most European countries either did not permit their forces in Afghanistan to engage in combat or limited combat to defense against attack; this caused tension between European NATO countries as well. Moreover, the Iraq War had strained U.S.-European relations, and most European governments came to regard the war in Afghanistan as unwinnable. Hence, they objected to the single-minded military focus of the American war effort, arguing that instead the best way to blunt the appeal and strength of al-Qaeda and the Taliban was to rebuild the country's economy and infrastructure.

Despite his immense popularity in Europe, President Obama failed during his April, 2009, European trip to garner pledges for additional support for the war in Afghanistan from European members of NATO. Withdrawing or abandoning Afghanistan would not, however, make the United States safe from al-Qaeda, the Taliban, and future terrorist attacks but would only embolden these groups and once again turn Afghanistan into the terrorist safe haven it was during the 1990's.

On February 9, 2009, Frederick W. Kagan, a noted military historian and influential scholar behind the successful "surge" strategy used in Iraq, in an article entitled "Planning Victory in Afghanistan," published in the *National Review*, criticized the current U.S. strategy in Afghanistan for conducting effective counterterrorism operations against al-Qaeda and the Taliban without simultaneously protecting the population from the militants and using economic and political programs to build popular support for the Afghan government (which would promote popular resistance to al-Qaeda and the Taliban). The U.S. focus exclusively on defeating al-Qaeda and the Taliban without simultaneously working to win over the Afghan people had delegitimized and marginalized both groups.

CONTEMPORARY SOURCES

The war in Afghanistan is an ongoing conflict, and much of the primary source information on the Afghanistan War is current and available online, including the U.S. Department of Defense's annual Narcotics Control Reports (Afghanistan section) and the U.S. Department of State's South and Central Asia Reports.

Most of the book-length primary sources take the form of memoirs that are just beginning to appear. *At the Center of the Storm: My Years at the CIA* (New York: HarperCollins, 2007) is a memoir by former director of the Central Intelligence Agency George Tenet, in which he discusses all aspects of the U.S. response to the September 11, 2001, terrorist attacks, the War on Terror, the Afghanistan War, and the Iraq War. Douglas Feith, former undersecretary of defense for policy, in *War and Decision: Inside the Pentagon at the Dawn of the War on Terrorism* (New York: Harper, 2008), gives an insider's view of the history of the early years of the War on Terror, including the Afghanistan and Iraq Wars. His book also includes facsimiles of U.S. government memos and other documents from the period.

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Stefan M. Brooks

The War on Terror

Dates: Since 1988

Political Considerations

Though the name "War on Terror" was invented by the administration of U.S. president George W. Bush (2001-2009), the conflict between the Western powers (and their allies) and the usually less organized and therefore more difficult-to-track terrorist groups long predates the 2000's. The constant conflict between Israel and its Arab neighbors, not to mention its Palestinian residents, made terrorism a concern of the United States, as Israel's staunchest ally. During the late 1970's, the birth of the Islamic revolutionary movement in Iran provided the United States with its longest involvement with Arab groups bent on America's destruction, when fifty-three hostages were held in the U.S. embassy in Iran for 444 days. Further attacks, such as the 1983 bombings of the U.S. embassy and Marine Corps encampment in Beirut, Lebanon, and the 1988 bombing of Pan Am Flight 103 over Lockerbie, Scotland, continually kept terrorism near the top of the evening newscasts.

The 1990's witnessed a rise in the frequency and lethality of international terrorism, principally from the Middle East, perpetrated by Islamic religious fanatics and culminating in the attacks against the United States on September 11, 2001. This tragic, three-pronged attack—in which hijacked airlines were deliberately crashed into the World Trade Center towers, the Pentagon, and (after heroic action on the part of passengers) a field in Pennsylvania—was followed by bombings in Bali, Indonesia, in 2002; Madrid, Spain, in 2004; London, England, in 2005; and Mumbai, India, in 2008.

After the 9/11 attacks, the United States' efforts under President Bush to combat international terrorism—particularly from al-Qaeda and its associates and affiliates—was called the War (or Global War) on Terror. Taking office in 2009, President Barack Obama dropped this controversial phrase in favor of "Overseas Contingency Operation." Nevertheless, the United States and Europe, as President Obama announced during his April, 2009, trip to the Continent, continued to face the very real threat of international terrorism.

Terrorism is not a new phenomenon—the 1960's and 1970's witnessed terrorism—nor has it been limited to foreign perpetrators. However, the decline and subsequent collapse of the Soviet Union in 1991, the rise of Islamic fundamentalism and its radicalization of the Middle East and Arab politics, the status of the United States as the sole remaining world superpower (along with the envy and hatred this created), the development of a truly global economy, and a growing interdependence among states in terms of communications, trade, and travel have all contributed to make terrorism more far-reaching and lethal to nation-states. The threat of nuclear war between the United States and the Soviet Union during the Cold War years (1945-1991) was replaced by international terrorism, and while that threat was disrupted and even weakened by the actions taken by the United States and its allies, it has yet to be eliminated, as demonstrated by the November, 2008, attacks on a hotel in Mumbai, India, which killed more than 170 people and injured some 300.

Initially, the world, including the United States, was slow in realizing—much less confronting—the growing danger posed by Islamic terrorism. Indeed, the National Commission on Terrorist Attacks upon the United States (the so-called 9/11 Commission), which investigated the events leading up to and during the September 11 attacks, cited a "failure of imagination" on the part of U.S. intelligence services, the Central Intelligence Agency (CIA) and the Federal Bureau of Investigation (FBI), as well as Congress for insufficient oversight of these and other agencies. Instead of recognizing the grave threat posed by al-Qaeda and like-minded groups, through-

out the 1990's the American intelligence services were operating from a Cold War mind-set. In addition, American law prohibited the sharing of intelligence between the CIA and the FBI, and outdated laws crippled efforts to track suspected terrorists in the United States.

Historically, the United States has suffered few terrorist incidents and thus on September 11, 2001, had little experience dealing with terrorism, such that the federal government was slow and unprepared to confront this growing threat. Even Western Europe, which had suffered acts of terrorism over the preceding few decades, seemed to have failed to appreciate the growing threat posed by Islamic terrorism. For example, as a brutal civil war raged in the former French colony of Algeria throughout the 1990's, pitting the army-run government against the terrorist organization known as the Islamic Armed Group (or GIA, Groupe Islamique Armée, for the French name of the group), the GIA launched terrorist attacks in France in retaliation against France's alleged sympathy (if not also covert support) for the army-backed Algerian government. GIA attacks in France included the 1994 hijacking of an Air France flight from Algiers to Paris with the aim of flying the plane into the Eiffel Tower or blowing up the plane over Paris to inflict mass casualties; the plane was recaptured by French commandos in Marseille, France, while being refueled. The GIA also launched a series of bombings in the Paris metro in 1995 that killed eight people and injured more than one hundred. These attacks by the GIA—particularly the attempt to use a commercial aircraft as a bomb, as would be done on 9/11—seem neither to have alerted European nations that Islamic terrorists were starting to direct their attacks toward Europe nor to have signaled the increasing reach and operational capability of these groups. Even the February 26, 1993, World Trade Center and April 19, 1995, Oklahoma City bombings in the United States seemed to have been treated by the U.S. government as almost aberrant acts—perhaps because of the successful arrest and prosecution of those responsible for both attacks: Ramzi Yousef (a member of al-Qaeda) in the case of the 1993 World Trade Center attacks and Timothy McVeigh and Terry Nichols (anarchist opponents of the federal government) in the Oklahoma case.

Preoccupied with events in Europe as the Cold War came to an end, the breakup of Yugoslavia and the ensuing civil wars in Bosnia and Croatia, the building of a "new world order," the push to expand the North Atlantic Treaty Organization (NATO) into Eastern Europe, and the outbreak of the 1990-1991 Persian Gulf War (which precipitated the decades-long confrontation with Iraqi leader Saddam Hussein), the world failed to appreciate not only that terrorism was growing but also, more ominously and for the first time, that terrorist groups, particularly Arab Islamic groups, had begun to develop an international character in terms of presence and reach, finance and support. Disparate Islamic Sunni groups that had fought together against the Soviet Union in Afghanistan (1980-1988) developed a sense of identity that transcended nationality and were organized between the late

TURNING POINTS

1988	After Pan American Flight 103 explodes over Lockerbie, Scotland, killing hundreds, state terrorism mounted by Libya is suspected as cause.
1993	A bomb attack on New York's World Trade Center kills 6 people and injures more than 1,000.
1995	The April bombing of a federal office building in Oklahoma City, Oklahoma, by one or more individuals allegedly affiliated with militia groups kills 168. Within the same week, a Japanese religious cult mounts a gas attack in a Tokyo subway, hospitalizing 400.
1996	Millionaire Islamic extremist Osama Bin Laden issues a declaration of war against United States.
1998	The simultaneous bombings of U.S. embassies in Kenya and Tanzania in August kill 224, and Bin Laden group supporters are suspected. United States conducts counterattack shortly thereafter against Bin Laden training base in Afghanistan.
2000	The October 12 suicide bombing of the USS *Cole* in the Persian Gulf kills 17 sailors.

1980's and early 1990's by the exiled Saudi Arabian Osama Bin Laden into al-Qaeda (Arabic for "the base").

Bin Laden, like countless other Muslims, had gone to Afghanistan to wage jihad (holy war) against the Soviet Union and used his inherited family fortune and organizational skills to recruit, arm, train, and organize the mujahideen (Arabic for "holy warriors of jihad"), thereby developing a favorable reputation among the mujahideen community. Shortly after forming al-Qaeda, Bin Laden met fellow mujahideen Ayman al-Zawahiri in Afghanistan, merging al-Qaeda with al-Zawahiri's Egyptian Islamic Jihadist followers in the early 1990's. Announcing that America had declared war on God and Islam, in February, 1998, Bin Laden and al-Zawahiri arranged for an Arabic newspaper in London, England, to publish a fatwa (or religious edict) calling it the duty of every Muslim to kill Americans. In a May, 1998, interview with ABC News reporter John Miller, Bin Laden said the defeat of the Soviet Union in Afghanistan and its subsequent collapse convinced him that "we shall—with the grace of Allah—prevail over the Americans and the Jews." In the same interview, he also warned that unless the U.S. government stopped catering to "the interests of Jews," al-Qaeda would "inevitably move the battle to American soil, just as Ramzi Yousef and others have done"—a direct threat to commit terrorist attacks in America. By 1992, al-Qaeda had begun launching terrorist attacks, first in the Middle East and then, as the organization and its members' competence expanded, in other parts of the world, including Africa, the United States, and Europe.

Military Achievement

Before the mass casualties inflicted by the attacks of 9/11, the United States and the rest of the world regarded terrorism as a problem for law enforcement rather than the military, emphasizing the arrest and prosecution of terrorists, such that where military force was used, it was limited to missile or air strikes designed to punish rather than destroy the terrorists and their safe havens. Until 9/11, despite several attacks overseas, the United States did not view terrorism as an act of war, and consequently airport security was lax and ineffective. Not until after 9/11 did President Bush declare a War on Terror, announcing to the world on November 6, 2001, that "you are either with us [the United States] or against us" in the global war on terrorism. Until 9/11, neither President Bill Clinton nor President Bush regarded terrorism as much of a threat to the United States. For that matter, the world was as surprised and horrified as Americans were at the ability of al-Qaeda to inflict such death and destruction (more than twenty-seven hundred people died in New York alone) on 9/11.

Despite the 1993 World Trade Center bombing, which had killed six people and injured more than one thousand, and the 1996 bombing of the U.S. Air Force's Khobar Towers barracks in Saudi Arabia, which killed nineteen airmen, not until August 7, 1998, and the American embassy bombings in Kenya and Tanzania, which killed twelve Americans and more than two hundred Africans, did President Clinton launch cruise missile strikes (on August 20) against al-Qaeda targets in Sudan and Afghanistan. These strikes, however, failed to kill al-Qaeda's leadership, including Bin Laden and al-Zawahiri, and, although destroying some al-Qaeda training camps (abandoned in anticipation of an American attack), had no effect on the organization; indeed, Bin Laden and al-Zawahiri promised more attacks against the United States. Although it is likely that any American response would have provoked additional al-Qaeda attacks, because America's response was ineffective and the use of missiles was interpreted by al-Qaeda as a sign of weakness (that the U.S. was unwilling to commit significant military forces and risk suffering casualties by committing ground troops to Afghanistan), Clinton's missile strikes probably only emboldened al-Qaeda.

It is worth remarking, however, that no political support existed among either Democrats or Republicans—or among the American people—for launching an invasion or even a limited ground campaign in Afghanistan, where the Taliban government had granted al-Qaeda sanctuary in 1996. In 1998, America still suffered from a false sense of invulnerability against terrorism, and therefore neither the will nor

U.S. Department of Defense

The USS Cole, *after a terrorist attack in Yemeni waterways in October, 2000, possibly by the Aden-Abyan Islamic Army.*

the support existed for overthrowing the Taliban regime and depriving al-Qaeda of its sanctuary and bases in Afghanistan. In 2000, al-Qaeda terrorists attacked the U.S. Navy ship USS *Cole* in Yemen, killing seventeen sailors and severely damaging the ship, but failed in an attempt to bomb Los Angeles International Airport after the bomber—who apparently was under surveillance by Canadian intelligence—was arrested at the U.S.-Canadian border with explosives in his vehicle.

The attacks of 9/11, however, shattered America's sense of invulnerability and, tragically, literally brought home the threat posed by al-Qaeda. Like his predecessor, it was not until faced with a crisis—this time, the 9/11 attacks—that President Bush took decisive action against al-Qaeda and international terrorism, launching the War on Terror with the stated aim of destroying al-Qaeda and states sponsoring or supporting terrorism. There was a strong outpouring of sympathy and support for the United States from most of the world as the 9/11 attacks united much of the world in solidarity with the Americans against al-Qaeda and terrorism. One month after 9/11, the United States, along with Britain, invaded Afghanistan, and two months later they overthrew the Taliban regime, inflicting heavy casualties on both Tali-

ban and al-Qaeda forces as U.S. and British troops and their Afghan allies in the Northern Alliance pursued fleeing militants. However, despite the swift collapse and defeat of the Taliban and al-Qaeda, Bin Laden and al-Zawahiri eluded capture or death, presumably fleeing during the December, 2001, Battle of Tora Bora into the lawless tribal areas of northwestern Pakistan.

On March 20, 2003, the United States and Britain invaded Iraq to overthrow Saddam Hussein for his continued refusal to comply with sixteen U.N. resolutions stipulating that he account for and give up all of his weapons of mass destruction (WMDs)—namely, biological and chemical weapons—and thus prove that he no longer possessed them. President Bush alleged that Hussein's defiance of the United Nations, his continued efforts to develop WMDs (in defiance of the United Nations), his past use of WMDs, the brutality of his regime, and his links to terrorism (including, allegedly, to al-Qaeda) constituted a threat to the United States and the world. Bush believed that with Hussein redeveloping his WMDs and ties to terrorism, he might once again wage war against his neighbors (as he had done by invading Kuwait in 1990), form alliances with terrorist groups (including al-Qaeda), and even supply terrorists with WMDs. In the wake of 9/11, Bush argued that the specter of Hussein repossessing WMDs was intolerable. The March, 2003, invasion of Iraq, followed by the overthrow of Hussein's government one month later, killed about 150 American soldiers in two months of fighting. The post-invasion occupation of Iraq, however, proved to be an enormous challenge and a problem for the United States in terms of mounting casualties (4,277 as of April 19, 2009, according to the U.S. Pentagon), sustained and soaring costs (estimated at around $860 billion as of 2009), and loss of significant world support. The Iraq War not only preoccupied the Bush administration for the next six years but also proved to be the main factor in the six-year decline of Bush's approval ratings (to approximately 34 percent, according to Gallup) by the time he left office on January 20, 2009. By 2007, however, after a much-needed shift in U.S. strategy and tactics, the situation in Iraq had finally started to improve, and by 2008 violence in Iraq, including American casualties, had declined significantly and the country and its nascent democratic government had become much more stable.

Although the situation in Iraq improved, conditions in Afghanistan worsened as al-Qaeda terrorists fled from Iraq to Afghanistan, political instability consumed Pakistan and sapped its willingness to confront Taliban and al-Qaeda terrorists hiding in Pakistan, and the Taliban and al-Qaeda regrouped and launched an insurgency against U.S. forces and the democratic Afghan government of Hamid Karzai. As American military deaths in Afghanistan rose by 35 percent in 2008 (and to 113 soldiers killed in February, 2009), President Obama pledged to "disrupt, dismantle, and defeat al-Qaeda and the Taliban" and dispatched to Afghanistan an additional 17,000 combat troops and 4,000 military trainers from the Eighty-second Airborne Division to train that country's army, bringing the total number of U.S. troops to about 27,000.

Weapons, Uniforms, and Armor

Al-Qaeda and its affiliates and associates have resorted to largely unconventional weapons to wage terrorism, using vehicles, boats (as in the case of the USS *Cole* attack), and airplanes (as on 9/11) to inflict mass casualties. In Afghanistan and Iraq, improvised explosive devices (IEDs), to say nothing of deadly ambush attacks, have killed hundreds of American and Allied, including NATO, troops. Al-Qaeda has also been known to rely on suicide bombings, as on 9/11 and in the Bali, Madrid, and London bombings.

Al-Qaeda and the Taliban lack firepower and technology, particularly the artillery, air power, and night-vision equipment used by U.S. forces. Therefore, they generally avoid open, prolonged engagements and favor ambushes and hit-and-run tactics. These serve to frustrate and demoralize their adversary, denying the enemy a decisive victory and thus prolonging the conflict. In so doing, the Taliban and al-Qaeda hope to win the psychological battle of wearing down the enemy by making the war seem endless and thus unwinnable.

MILITARY ORGANIZATION

The organization of forces in the war against terrorism is as nebulous and varied as it is vast. On the U.S. and Allied side, military organization comprises military and civilian departments within the U.S. government and the military forces and government offices of other Allied nations. Although the military structure and interrelationships of the myriad terrorist and extremist groups worldwide would take more than one volume to cover in detail, some rundown of the main players in the War on Terror is helpful.

Each terrorist group has a different structure, and often those structures change as soon as Western intelligence can classify them. Although al-Qaeda and the Taliban dominate the headlines, groups classified as current threats are not limited by geography. Other groups involved in the War on Terror include Colombia's National Liberation Army and Revolutionary Armed Forces of Colombia (both of whose members have carried out kidnappings of American citizens), Al-Jihad (whose members assassinated Egyptian president Anwar el-Sadat), al-Gama'a al-Islamiyya in Egypt, the National Liberation Army of Iran in Iraq, Aum Shinrikyo (Supreme Truth) sect in Japan (which carried out the 1995 Tokyo subway attack using sarin nerve gas), Hezbollah in Israel and Lebanon (which carried out the 1983 bombing of the U.S. Marine barracks), Hamas in Israel, Harakat ul-Ansar and Harakat ul-Mujahidin in Pakistan, the New People's Army in the Philippines, the Revolutionary United Front in Sierra Leone, the Liberation Tigers of Tamil Eelam in Sri Lanka, the Revolutionary People's Liberation Party in Turkey, and the Islamic Movement of Uzbekistan. Of course, the very nature of these transitory groups means that they are constantly and currently metamorphosing, as new groups are founded out of the remnants of old ones.

In the aftermath of the September 11, 2001, terrorist attacks, President Bush created the Department of Homeland Security, under whose auspices many previously independent federal bureaus and offices were consolidated, including the National Guard, the Federal Emergency Management Agency, the Coast Guard, Customs and Border Protection, Immigration and Customs Enforcement, Citizenship and Immigration Services, the Secret Service, the Transportation Security Administration, and the Civil Air Patrol. In addition, although the U.S. government has long called operations to quell terrorism and secure the country a "war," the varied and often unstructured nature of terrorist organizations has raised questions as to the status of their "soldiers." For its purposes, the United States has called them "unlawful combatants," which allows the United States to escape the provisions of the Geneva Conventions. However, such a characterization has not gone without criticism by the American public, as has been demonstrated by the backlash against the use of torture and the indefinite confinement, without being charged, of Iraqis and other nationals deemed to have been involved in international terrorism at the Joint Task Force's detention camps at Guantánamo Bay (Gitmo).

DOCTRINE, STRATEGY, AND TACTICS

Al-Qaeda and the mujahideen community in general developed significant combat experience fighting the Soviet Union in Afghanistan from 1979 to 1989, and those experiences served as the basis for their insurgency campaign against U.S. and Allied forces, including NATO forces, in Afghanistan and Iraq. In Iraq, the United States was able, under the leadership of U.S. Army general David Petraeus, then commander of U.S. forces in Iraq, to reverse most of the violence and terrorism plaguing Iraq. His strategy, known as the surge, changed the way the United States and its allies were battling al-Qaeda and other insurgents and terrorist groups in Iraq by denying them the ability to control territory, terrorize, and enjoy sanctuary among the local population. Under General Petraeus, the strategy of the United States was to clear and hold territory; instead of remaining ensconced in well-defended bases distant from violence, the U.S. military, along with Iraqi forces, took up residence inside the most violent areas of Iraq not only to eliminate insurgent activity but, just as important, to hold the territory, thereby denying the insurgents and terrorists sanctuary and support. As security improved (along with the competence of Iraqi

forces), so did civil services, and the insurgents and terrorists lost much of their support and, at least temporarily, were rendered largely ineffective. In 2009, al-Qaeda no longer even mentioned Iraq in its propaganda broadcasts—a tacit admission it had failed to turn Iraq into a terrorist state.

In addition to the surge, al-Qaeda's killing of Muslim insurgents contributed to the improvement in Iraq's security, encouraging many Iraqis to turn against al-Qaeda through so-called awakening councils and enabling the United States to recruit former insurgents and terrorists to fight al-Qaeda.

Whether such a surge can succeed in Afghanistan is a different matter, since conditions in that country are very different from those in Iraq. Unlike Iraq, terrain in Afghanistan is dotted with high mountains and deep valleys and caves, along with treacherous weather, especially in the winter. There is little sense of a national identity or unity among the people of Afghanistan, and politics are based instead on ethnic (tribal, clan, and linguistic) identities. The country lacks a history of a centralized government and, in addition to its rough terrain, its lack of a national system of roads makes travel difficult. Furthermore, the presence of a porous mountainous border with Pakistan to the east—and vast, essentially anarchic border regions (the North-West Frontier Province and Federally Administered Tribal Areas), autonomous from Pakistani government control—gives al-Qaeda and the Taliban sanctuary.

In his first year in office, President Obama continued the Bush administration's policy of unmanned Predator drone strikes along the Afghan-Pakistani border and also inside both the North-West Frontier Province and Federally Administered Tribal Areas, much to the anger of local residents, who not only sympathized with al-Qaeda and the Taliban but also claimed that these strikes have killed innocent civilians. The Pakistani government also objected to these strikes as a violation of its sovereignty, because of the civilians killed as well as the effect that attacks had of fanning anti-American sentiment. Exacerbating these problems was a weak and unstable Pakistani government, paralyzed from both a series of political disputes and a surge of terrorist acts fomented by al-Qaeda and its affiliates and associates. The tension and hostility between the United States and its NATO allies regarding Afghanistan was another factor contributing to the problems: The United States resented having to shoulder most of the military burden in Afghanistan and viewed Europe as not doing enough to help in the the fight against al-Qaeda and the Taliban; in addition, most European countries did not permit their forces in Afghanistan to engage in combat (or limited such engagements to responses to being attacked).

On the other side, the Iraq War strained U.S.-

U.S. Navy

A small portion of the destruction of the World Trade Center towers in Manhattan, a few days after the September 11, 2001, terrorist attacks.

European relations, and most European governments, regarding the war in Afghanistan as unwinnable, objected to the military focus of the American war effort, arguing that the best way to blunt the appeal and strength of al-Qaeda and the Taliban was to rebuild the country's economy and infrastructure. Despite President Obama's immense popularity in Europe, his April, 2009, European trip was notable for its lack of success in gaining pledges of additional support for the war in Afghanistan.

In any case, withdrawing or abandoning Afghanistan would not make the United States safe from al-Qaeda and future terrorism; such a course of action would only embolden al-Qaeda and Afghanistan would once again become the terrorist safe haven it was during the 1990's. It seems likely that the War on Terror will continue for a very long time, and the best-case scenario is that the United States will stop and maybe even reverse much of the surge in al-Qaeda and Taliban attacks.

CONTEMPORARY SOURCES

Despite President Obama's change in nomenclature, the War on Terror is an ongoing conflict, with new primary sources being generated almost daily. There are a few indispensable pieces, without which the War on Terror cannot be fully understood. *The 9/11 Commission Report: Final Report of the National Commission on Terrorist Attacks upon the United States* (New York: W. W. Norton, 2004), is a sort of manual for the War on Terror, outlining the context of the September 11, 2001, terrorist attacks, and the U.S. government's response to the attacks. Most of the book-length primary sources take the form of memoirs that are just beginning to appear. *At the Center of the Storm: My Years at the CIA* (New York: HarperCollins, 2007) is a memoir by former director of the Central Intelligence Agency George Tenet, in which he discusses all aspects of the U.S. response to the September 11, 2001, terrorist attacks, the War on Terror, the Afghanistan War, and the Iraq War. Douglas Feith, former undersecretary of defense for policy, wrote *War and Decision: Inside the Pentagon at the Dawn of the War on Terrorism* (New York: Harper, 2008), in which he gives an insider's view of the history of the early years of the War on Terror, including the Afghanistan and Iraq wars. The book also includes facsimiles of U.S. government memoranda and other documents from the period.

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Stefan M. Brooks

Warfare and the United Nations

Dates: Since c. 1990

Political Considerations

International law recognizes the right of states to defend themselves. The United Nations system requires all states to abide by Article 2.4 of the U.N. Charter, prohibiting threat and use of force while also requiring that states resort only to peaceful countermeasures when addressing a breach of their legal rights by another state.

Chapter VII of the U.N. Charter vests the U.N. Security Council with broad powers of forcible intervention. It can intervene whenever it determines, under Article 39, that there exists a threat to the peace, a breach of the peace, or an act of aggression. It can then decide, under Article 41, upon sanctions that do not involve the use of force of arms, or it can then decide, under Article 42, to take action by force of arms against the aggressor or the state threatening peace.

The basic rule about the unilateral use of force in international relations is that such use is forbidden. The only exception is in the "inherent right of individual or collective self-defense if an armed attack occurs." The term "armed attack" in this context means a "very serious onslaught" either on the territory of the injured state or on its agents or citizens, while they are at home or abroad, meaning in another state or in international waters or airspace. According to Article 51 of the U.N. Charter:

> Nothing in the present Charter shall impair the inherent right of individual or collective self-defence if an armed attack occurs against a Member of the United Nations, until the Security Council has taken measures necessary to maintain international peace and security. Measures taken by Members in the exercise of this right of self-defence shall be immediately reported to the Security Council and shall not in any way affect the authority and responsibility of the Security Council under the present Charter to take at any time such action as it deems necessary in order to maintain or restore international peace and security.

States have the right to resort to collective self-defense in the case of aggression by arms, subject to the request or consent of the victim of aggression. The collective self-defense measures do not affect or prejudice the possible operation of the U.N. security system. The U.N. security system may authorize states to take forceful measures against the wrongdoer if the U.N. Security Council concludes that a gross violation of international community obligations amounts to a threat to the peace, a breach of the peace, or an act of aggression. The U.N. Security Council takes over when it faces an international wrongful act that it deems that Article 39 of the U.N. Charter covers.

The U.N. Charter also sets a number of limits upon the right of self-defense, which Article 51 enshrines. This provision, which has developed into a provision of general international law, allows the use of force only in self-defense in order to repel an "armed attack," and the defending State must immediately inform the Security Council of the action of using arms in self-defense. Article 51 envisages self-defense as a provisional measure by which the victim of an attack by force of arms may safeguard its rights until the security system, which centralizes this function, begins to work.

The basic deficiencies of the collective security system the U.N. Charter outlines include the assumption of continuing agreement among the permanent members of the Security Council: the United States, Russia, China, the United Kingdom, and France. This "P5" consensus was the basis for the proposal of a collective monopoly of force that they would hold accordingly. Dissent with the individual veto power that the U.N. Charter gives to each permanent mem-

ber gives each the right to cripple the system. The Cold War gave the permanent members the incentive to exercise this veto against an adversary's draft resolutions proposed under Chapter VII. Consequently, a distinguishing tendency to the present has emerged among states to engage in war under the cloak of "self-defense" without having to fear any decisive hindrance from the United Nations. In a number of cases, states have resorted to unilateral force under the cover of self-defense, protection of nationals abroad, or preemptive self-defense.

MILITARY ACHIEVEMENT

The end of the Cold War with the 1991 dissolution of the Soviet Union led to an increase in Great Power cooperation. The net result has been an increase in the number of peacekeeping operations, as well as in their size and complexity. The United Nations established only fifteen peacekeeping operations before 1988. Since then, the United Nations has established approximately forty such operations.

Two other critical features of peacekeeping operations are consent of the territorial state and impartiality. In some cases, peacekeeping has proceeded on the basis of a partial consent, meaning that peacekeeping forces have lacked the consent of one or more of the parties in the conflict. This situation has jeopardized the impartiality requirements of the operation. In 1992-1995, the U.N. Operation in Somalia (UNOSOM I) underwent a radical transformation through action by the Security Council, when UNOSOM I became UNOSOM II. The Security Council endowed UNOSOM II with enforcement powers under Chapter VII of the U.N. Charter (Resolution 814/1993). In Resolution 836 (June, 1993), the U.N. Security Council authorized the U.N. Protection Force (UNPROFOR) in the former Yugoslavia, "acting in self-defense, to take the necessary measures, including the use of force, to reply to bombardments against the safe areas by any of the parties."

The United Nations deployed forces in all three cases where no peace existed to keep, that is, in situations of ongoing conflict within states and in which a partial or nearly total breakdown of governmental authorities had taken place. This trend in entrusting peacekeeping forces with enforcement functions has, however, undergone strong criticism—nor has it developed to the point of creating a special category of U.N. peace-enforcement units, which U.N. Secretary General Boutros Boutros-Ghali envisaged in 1992 in his "Agenda for Peace."

On other occasions, the U.N. Security Council implicitly authorized regional or other organizations or arrangements to use force. The Security Council authorized, for example, maritime operations to enforce the embargo, as well as air operations to back up the peacekeeping forces (UNPROFOR) protecting safe areas. The implementation of the authorization was implicitly but obviously to occur through the West European Union (WEU) and the North Atlantic Treaty Organization (NATO). The Security Council authorized NATO to establish a multinational force in Bosnia-Herzegovina, the Implementation Force (IFOR), which subsequently became the Stabilization Force (SFOR) after the end of the war in 1995. Its mandate was to ensure, if necessary by the use of force, the implementation of the General Framework Agreement for Peace in Bosnia and Herzegovina (Dayton Agreement).

Yugoslavia was the conflict with the greatest degree of complexity that the United Nations had confronted since the end of the Cold War. The developments in the following years of war in the former Yugoslavia included unsuccessful diplomatic efforts to end the conflict, including the Vance-Owen plan, the establishment by the Security Coun-

TURNING POINTS

Feb., 1991	U.N. forces undertake a decisive ground assault on Iraqi positions in Kuwait.
Apr., 1991	No-fly zones are established and enforced in Iraq to prevent repression of Kurds in northern Iraq.
Jan., 1996	An international force composed largely of NATO troops is deployed in Bosnia to ensure the implementation of the Dayton Accords.

cil of an International War Crimes Tribunal with the jurisdiction to prosecute crimes that had occurred in the violent conflict in the former Yugoslavia, and the authorization of member states by the Security Council in Resolution 816 in 1993 to take "all necessary measures in the airspace of the Republic of Bosnia and Herzegovina, in the event of further violation, to ensure compliance with the ban on flights." On May 6, 1993, Security Council Resolution 824 declared the cities of Sarajevo, Tuzla, Zepa, Goražde, and Bihać in Bosnia-Herzegovina as safe areas, after the United Nations declared Srebrenica and its surroundings as a safe area in Resolution 819 of April 16, 1993. Between April, 1994, and February, 1995, NATO airplanes conducted nine limited attacks against Serbian targets on the ground. In March, 1995, the Security Council decided on the replacement of UNPROFOR by three separate but interlinked peacekeeping operations in Bosnia-Herzegovina (UNPROFOR), Croatia (U.N. Confidence Restoration Operation, or UNCRO), and Macedonia (U.N. Preventative Deployment Force, or UNPREDEP).

AP/Wide World Photos

U.S. M-1A1 Abrams tanks enter Bosnia in 1995 as part of a U.N. peacekeeping force that would allow the United Nations to focus on humanitarian issues.

On August 28, 1995, thirty-eight people died in the Muslim part of Sarajevo by artillery fire, for which NATO held the Serbs responsible. This action led to Operation Deliberate Force on August 30, 1995, which lasted until September 14, 1995. It included heavy bombardment of troops, weapons, military installations, and production sites. The targets also included civilian traffic routes, intersections and bridges, and targets throughout the whole part of Bosnia-Herzegovina that the Serb forces controlled, going beyond the U.N. mandate to protect the safety zones.

The parties initialed the General Framework Agreement for Peace in Bosnia and Herzegovina on November 21, 1995, at a U.S. Air Force base near Dayton, Ohio. They signed this "Dayton Agreement" in Paris on December 14, 1995, with the five members of the "Contact Group" witnessing: the United States, Russia, France, Germany, and Britain. In accordance with the terms of the agreement, on December 15, 1995, the U.N. Security Council authorized the deployment of a 60,000-member multinational military Implementation Force (IFOR), having within it NATO and non-NATO forces, to replace

UNPROFOR as of December 20, 1995, and to ensure compliance with the Dayton Agreement. Apart from the air strikes, in the case of Yugoslavia the Security Council was reluctant to back up by military sanctions the decisions it had taken under Chapter VII following the initial Resolution 713 of September 25, 1991.

The 1999 Kosovo crisis put this post-Cold War system, which the international community had consolidated, at significant risk. NATO decided to attack the Federal Republic of Yugoslavia (Serbia and Montenegro) without any Security Council authorization because of the massive gross violations of human rights by de facto and de jure state agents who were perpetrating them against the Kosovar population. The response of some commentators is that the Security Council, acting through Resolution 1244/1999 (adopted after the end of the war), endorsed NATO's action ex post facto. A gradual alteration of the legal framework governing the use of force emerged as a consequence of the events of September 11, 2001, which focused world attention on terrorism. Which terrorist group had actually launched the attack was not clear on that day or for weeks afterward—nor was the answer clear as to whether or not one or more states had been instrumental in organizing and effecting the strike or at least harboring and assisting the terrorists.

The U.N. Security Council unanimously passed a resolution, 1368, on September 12, 2001. Its preamble "recognized" the right of individual and collective self-defense, plainly of the United States and other states willing to assist it, respectively. The resolution defined the terrorist acts of September 11 as a "threat to the peace" and, therefore, not as an "armed attack," which would legitimize self-defense under Article 51. A later U.N. Security Council resolution, 1373, which it adopted on September 28, 2001, expressed the Security Council's "readiness to take all the necessary steps to respond to the terrorist attacks . . . in accordance with its responsibility under the Charter of the United Nations." The U.N. Security Council declared itself, thereby, to be ready to authorize military and other action, if necessary. This resolution wavered between the desire to take matters into its own hands, on one hand, and resignation to unilateral action by the United States, on the other. The ambiguity of the resolution probably stems to a large extent from the will of the United States to manage the crisis by itself, though with the possible assistance of states of its own choice. It wanted to do so without having to go through the U.N. Security Council and regularly report to it.

On the same day, relying on Article 5 of the NATO Statute, the North Atlantic Council unanimously adopted a statement providing for the right of collective self-defense in case of attack on one of the (then) nineteen members of the Alliance. The NATO member states opted to base their solution on U.N. Charter Article 51, thereby referring to the right of self-defense as the avenue rather than collective use of force under the authority of the Security Council.

Practically all states took an attitude that implied a considerable departure from the legal system on the use of force in the matter of a few days, to the effect of broadening the notion of self-defense. States came to assimilate action by a terrorist group amounting to a "threat to the peace" with aggression by force of arms, thereby entitling the victim state to resort to individual self-defense and third states to act in collective self-defense at the request of the former state. The events following September 11, 2001, allowed the victim state of terrorism to resort to a delayed response, undertaking self-defense use of force after some lapse of time. Classic legal doctrine on self-defense requires that the state react immediately to a specific aggressor state. The international community held as admissible that the United States could establish by its own judgment which state had harbored, supported, and assisted the terrorists. The United States thereby became itself accountable and a legitimate target of military reaction. The traditional U.N. Charter system of self-defense implied that the state acting in self-defense may strike only at a specific state or group of states—that is, the aggressor or aggressors. In other words, the victim state could not choose the target; the victim state was to respond immediately to an act of aggression.

On October 7, 2001, the United States, with the initial assistance of the United Kingdom, initiated military action against Afghanistan, which it termed Operation Enduring Freedom. The United States al-

leged that its aim was to destroy the bases and infrastructure of the terrorist organization al-Qaeda in that country. It also intended to disrupt the incumbent Afghan authorities, the Taliban. The United States claimed that the Afghan authorities actively assisted, supported, and even used the terrorist organization. The United States invoked the right to individual self-defense, and the United Kingdom relied upon the right of collective self-defense. Both the United States and the United Kingdom claimed that they were responding to the terrorist attacks on the World Trade Center and the Pentagon, thereby acting to deter further terrorist attacks. The military action in Afghanistan lasted a few weeks. Only Iraq and Iran among the community of states openly and expressly challenged the legality of resort to force by the United States, with initial British help. Later, in a letter to the U.N. Security Council, the United States asserted its right to use force not only against Afghanistan but also against other organizations and countries that it claimed were supporting terrorism. Later, the United States mentioned Iran, Iraq, and North Korea. The United States acted forcibly through the United Nations in Iraq in 1990-1991, in Somalia in 1992, and in Bosnia-Herzegovina, 1992-1995, but when the U.N. support was not forthcoming, it acted through NATO in Kosovo in 1999. In other instances, the United States refrained from taking action because it did not have a sufficiently intense interest to intervene (Rwanda in 1994, Sierre Leone in 2000), or it engaged in military operations without any U.N. authorization (Iraq, 2003-2004).

WEAPONS, UNIFORMS, AND ARMOR

National ground-force contingents participating in U.N. peacekeeping operations are typically characterized by their distinctive, white-painted armored vehicles, designed to facilitate their identification as a neutral force. Military personnel typically paint their helmets the distinctive U.N. sky blue. The United Nations also awards its own military decorations for meritorious service in peacekeeping operations.

MILITARY ORGANIZATION

The founders of the United Nations never envisaged the formation of an "army" that was to be at the disposal of the U.N. proper, exclusively dependent on the U.N. Security Council. Originally, the various member states were to place forces at the disposal of the Security Council as military contingents. Special agreements would determine the number and type of forces and their readiness. The U.N. Security Council would exercise its authority over national forces. These national forces would act under the strategic and military direction of the Security Council's Military Staff Committee. The Charter did not envisage that a state sending a contingent would continue to exercise command and control over it, but by the same token it did not clearly exclude national control,

AP/Wide World Photos

The U.N. Security Council in 1999, voting to allow one more month for the Taliban, which controlled Afghanistan, to hand over Osama bin Laden for trial.

AP/Wide World Photos

U.N. peacekeepers with clearly marked vehicles drive toward Kibati in eastern Congo in November, 2008.

leading to the dangerous possibility of a "dual allegiance" paralyzing these units. However, with the polarizing effect of the Cold War, the attempt at centralizing the use of force failed.

DOCTRINE, STRATEGY, AND TACTICS

The framers of the U.N. Charter envisaged a different Chapter VII regime governing the use of force in international relations other than the role that U.N. peacekeeping operations fulfill, just as the "authorizations regime" giving complete control to individual member states when using force to enforce the will of the U.N. Security Council also differs. Nevertheless, Chapter VII has become one of the most important U.N. tools, and often the only available one. According to Antonio Cassese (Italian jurist and first president of the International Criminal Tribunal for the former Yugoslavia), the international community universally recognizes it as consistent with the Charter.

The intent of peacekeeping operations is not actually to compel the parties to accept a solution that the U.N. imposes but rather to help put into practice, on the spot, the solution upon which the contending parties agree. U.N. peacekeepers can be very helpful in facilitating the fulfillment of complex peace processes in which the parties are willing to cooperate and build for the future. They of course must serve the first task of stopping the parties from fighting. They also, however, have come under criticism for being counterproductive, in that they freeze the situation without providing a real solution to the basic problems lying at the root of the conflict. An example of a successful U.N. peacekeeping operation in-

cludes the United Nations Interim Force in Lebanon (UNIFIL), which assisted in making possible, and less dangerous, the Israeli withdrawal from Lebanon in May and June of 2000. UNIFIL helped stabilize the situation there.

The notion of anticipatory self-defense is a controversial one, with prominent legal scholars disputing and qualifying it. The main concern is that anticipatory self-defense becomes a justification for any use of force. Nuclear weapons, and arguably other forms of weapons of mass destruction (WMDs), have added a new dimension to this argument. Many reject the principle of anticipatory self-defense as legally valid, arguing that it has no legal basis in Article 51 of the U.N. Charter or in customary international law.

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Benedict E. DeDominicis

Global Military Capabilities

Dates: 2010

Overview

The military capabilities of 2010 are not goals for the future but the functions of our militaries today. Indeed, some militaries today seem to be militaries of tomorrow, with robots, drone airplanes, and other high-tech weapons. Speed and communication are considered the most valuable traits in a modern army, the high cost of which has led to an incredible diversity in military capabilities. The level at which a nation can conduct warfare has many measurements. Is it strong enough to protect itself from aggressive neighbors? Can it project power beyond its own borders? How far can it project and how much of its forces can be mobilized? How quickly can its army move its forces?

Significance

Throughout the ages, armies have used superior speed and mobility to gain an advantage, and the armies of today must be faster than ever before. Beyond conventional warfare, a modern military must also be able to compete with asymmetric warfare—to deal with guerrilla tactics, kidnappings, terror bombings, and fighting in close proximity to civilians. Like conventional warfare, asymmetric warfare has evolved. Insurgents and malcontents make excellent use of mass communications to strike at civilians around the globe.

Definitions of Global Military Capabilities in 2010

The complications mentioned above create benchmarks by which the military capabilities of a nation can be assessed. Few nations are able to excel in all areas. The strata of modern militaries can be broken down into innumerable subcategories of those who are able to meet certain challenges but lack the capabilities to meet others, but for simplicity's sake can be divided into three groups. Those in the top tier are, unsurprisingly, those nations with high military budgets, nuclear weapons, and a hand in the direction of global politics. The second-tier nations all have respectable conventional militaries, capable of protecting their borders, but lack the resources to project that power in other parts of the world. The third tier consists of nations that lack advanced military technology and use archaic weapons and weapon systems. This analysis will address the soldiers of asymmetric warfare, or "fourth-generation warfare," as it is heralded by some. These soldiers are known by many names: guerrilla, insurgent, terrorist, and freedom fighter among them. Although it is difficult to gauge the capabilities of these forces with accuracy, any study of upcoming armed conflict, and military capability, would be remiss to exclude them.

It is generally those nations with the strongest economies and highest military budgets that have the most advanced militaries. In 2010, the nations on this exclusive list were the People's Republic of China (referred to herein as China), the Russian Federation, the United States, France, the United Kingdom, India, Pakistan, Israel, and North Korea. These nations have sophisticated machines, cutting-edge electronics, and huge numbers of troops, planes, and tanks. It is important to note that not all of the world's major powers seek to project military force globally. Many are simply concerned with national security. Currently North Korea, Israel, India, and Pakistan are mainly interested in national security. China is evolving from a period of defense to one of interest in global affairs. In fact, only the member nations of the North Atlantic Treaty Organization (NATO) seem mainly concerned about projecting their military

AFP/Getty Images

U.S. president Barack Obama at the Group of Eight (G8) meetings in Italy during July, 2009, where he expressed "serious concern" over post-election violence against demonstrators in Iran.

might across the planet. Therefore, as different as each of these nation's military goals are, their nuclear weapons tie them together.

Some individuals and organizations argue that nuclear weapons have, to a great extent, lost their place in battle and have become purely political tools. The invasion of Israel in 1947-1948 illustrates that nuclear weapons do not necessarily prevent attack. Nuclear weapons give negotiating power, but they do not win wars or protect any nation completely. For rival nuclear powers like India and Pakistan, the possibility of nuclear war is very real, held off only by a fragile peace. Here nuclear weapons produce the same circumstances that they did in the Cold War. The theory of mutual assured destruction (MAD) has brought the nations to the negotiating table.

Hence, the major asset of a nuclear arsenal remains the defensive advantage gained by the threat of large-scale destruction. An excellent example is the newest member to the nuclear club. In 2006, North Korea conducted its first successful nuclear test. The result was that Western powers were forced to see North Korea in a new light; once admitted to the club, "nuclear" nations are given a new respect. Even before North Korea started its nuclear weapons program, it had built a substantial military. In fact, having the enormous amount of money that is necessary to develop nuclear weapons, as all of these nations have, means there is a great deal of money available for investment in building an excellent conventional army. Let us take a closer look at the military capabilities of the United States and China.

U.S. MILITARY CAPABILITIES

Strategic capabilities are what make the U.S. armed forces such a powerful military. The United States has the ability to project military power to almost any part of the globe and can do so very quickly. The American military has bases throughout Europe—in Germany, Italy, and the United Kingdom. It has bases in the Pacific—in Alaska, Hawaii, Singapore, Japan, and Australia. It even has permanent bases in the Middle East—in Kuwait, Oman, Qatar, and Saudi Arabia. Beyond bases, it has forces abroad in Bosnia, Egypt, Ethiopia, Hungary, Turkey, Kyrgyzstan, Tajikistan, Uzbekistan, and the former Yugoslavia. Even that is not a complete list of known bases and deployments. This worldwide presence gives the United States its unmatched ability to deploy troops far and wide; it is strategic planning at the highest level.

How fast can the American military respond to international threats? Unfortunately, that information is not readily available. The U.S. military is understandably cautious about disclosing response times to international threats; however, some of the U.S. ability to deal with domestic threats has been announced. The U.S. government has stated that the Marine Corps is capable of deploying two platoons of soldiers anywhere in the United States within twenty-four hours, and then is able to support those Marines with another thousand soldiers within three days. Considering the size of the continental United States, twenty-four hours is quite a short amount of time. The use of this type of accelerated deployment domestically is a response to new threats.

AP/Wide World Photos

A robot designed to detect improvised explosive devices (IEDs), used by terrorists and other insurgents, in Afghanistan in 2005.

The shock of the terrorist attacks on September 11, 2001, sent a devastating message to the United States. Americans realized that, although they had little to fear from most conventional armies, they were still vulnerable. As in the case of the special unit of Marines mentioned above, the U.S. has invested heavily in research and development of tactics to deal with asymmetric warfare. In the search for viable counterstrategies to terrorism, the United States has developed ideas such as "network-centric warfare" and has invested billions in robotics and information technology.

One pursuit of the United States and other top-tier nations has been robotics. Used commonly in manufacturing, robots (robotic devices) have been examined by the military for their use in warfare. The wars in Iraq and Afghanistan have finally brought these science-fiction dreams into reality. Drone airplanes, controlled by soldiers thousands of miles away, are a perfect example of the type of warfare one can expect to be increased in the future. Drone airplanes, and the robotic aides that accompany ground troops, mark a very interesting turning point in warfare. Many of the robots in service now are used to do jobs that are considered too dirty, too dangerous, or too demanding (the "three D's") for human soldiers. In using robots to locate and disarm improvised explosive devices (IEDs), for example, robots have become human proxies; they are being used to limit the discomfort and danger of warfare. The impact of robots in the near future has not yet been fully conceived, however, and tough questions are already being asked. How do robots identify targets? What if the robot's program fails to work and it attacks a friendly target? What if it sees a child with a gun? Although we are a long way from automated tanks and electronic super soldiers taking over for humans, the presence of robots on the battlefield increases daily, and their impact on warfare is changing the way that militaries assess threats.

China's Military Capabilities

In stark contrast to the United States, China's military seems powerful but slow. This is not a failing of the Chinese military People's Liberation Army (PLA) but is in fact adherence to China's central international policy: noninvolvement. Despite that ideology, China is beginning to emerge from its shell and is enhancing its capabilities for power projection. In mid-April of 2009, China celebrated its navy's sixtieth anniversary. To mark the occasion, it brought out a great deal of its fleet on maneuvers. The fleet is composed of modern destroyers, submarines, and frigates. Although many Chinese citizens flocked to the highly publicized event, the maneuvers were not for the people's entertainment; they were intended as a spectacle for the rest of the world to see.

China has the largest land army in the world, but it is still in the process of modernization. China announced that during the 2010's it will focus on closely integrating its various military branches—a prerequisite for developing advanced strategic capabilities. China's two international focuses are acquiring sources of oil and the reintegration of Taiwan (the latter is considered a domestic issue by the People's Republic). Although the United States pledges its continued support to Taiwan's independence, if China decided to invade Taiwan, the conflict would be short and likely end in China's favor, since China is fully capable of quickly pacifying the tiny nation. American support, however, keeps Taiwan's independence a political and not a military issue. In January of 2007, China shot one of its own satellites out of space. The action was a show of China's military advances. Along with its own program to put more satellites into space, the satellite strike suggested that China is moving to become a player in the game of information warfare.

Network-centric Warfare

The greatest technological advances have been in information-gathering technology, not robotics. Since 1991, a great deal of the information and communication technology that the United States used to overpower Iraqi forces has become commercial technology: the Global Positioning System (GPS), night-vision goggles, thermal imaging cameras, and satellite photographs of anywhere on Earth available over

the Internet. Since these technologies are now widely available, advanced nations seek to gain further control over the flow of information. This information advantage forms the basis for network-centric warfare (sometimes referred to as "net-war").

Freed from constant military threats, advanced nations like the United States, Russia, and China have turned their focus to dominating their opponents' communications. Because of the incredible amount of information that is available from satellites, spy planes, and long-distance detection devices, a battle can be fought over hundreds of miles in multiple locations. The modern theater of engagement could include offshore batteries from miles away, tactical bombing and missile attacks from aircraft, indirect fire from mobile batteries, and enfolding tactics from soldiers behind enemy lines (deep striking). With modern technology, attacks can be synchronized and coordinated across an entire country.

The key theory in net-war is that the army that has the most information, and that is able to make best use of that information, is unbeatable—or, as stated in a report by the Center for Strategic and International Studies, "[to be] able to penetrate the enemy's decision making system and react so quickly that the opponent cannot compete." In ages past, if a battlefield commander could find a key spot in battle from which to gain the advantage, that commander was said to have an "eye" for the battlefield. Now battlefields are so large that the only "eye" of any use is one from a satellite or aircraft.

FOURTH-GENERATION WARFARE AND NONCONVENTIONAL THREATS

The capability for power projection via strategic warfare is what stands between many modern nations and a world-class army. Although some nuclear powers are not actively projecting power, they have the capabilities to do so. The second-tier nations listed above lack the resources or motivation to project power outside their region. These nations build up their militaries mainly for defense. Outside the major powers there are many large and powerful militaries. Most European countries are proud of their armed forces, as are nations like Turkey, Egypt, and South Korea.

Not everyone, however, is convinced that the robot revolution and net-centric warfare are the keys to modern military dominance. Fourth-generation warfare, or 4GW for short, is a theory that focuses on the changing nature of warfare. 4GW states that in the modern era we have passed the days of centralized warfare between well-organized armies, having moved into an era of warfare when armies fight against small cells of armed civilians. Fourth-generation warfare has its own critics, however, who point out that a new theory is not needed to explain guerrilla war tactics—which have been used for thousands of years. What the theory of fourth-generation warfare identifies is that we are moving into a period when conflicts between ideologies and inequalities are championed (or taken advantage of) by militant groups. Using modern technology, these militants are able to move quickly and communicate secretly. Military analysts point to conflicts like those in Vietnam, the wars in Afghanistan (both the 1979-1989 Soviet and the current U.S. attempts to pacify the area), and the current conflicts in Israel and Iraq to show the weakness of conventional armies. Therefore, modern militaries must adapt; they must become more flexible, more covert, and better able to handle a range of different threats. Instead of using a platoon of tanks to accomplish a mission, for example, they must use covert operations ("black ops").

One great benefit of the 4GW theory is that it takes into account a wide range of capabilities and combatants. In fact, that range is the whole point of 4GW—it covers militants from African warlords to the Sri Lankan Tamil Tigers. They are usually either loosely connected or not connected to traditional armies and fight for ideology, resources, or family or tribal groups instead of a national military. These groups are so small that they are infuriatingly difficult to pin down by conventional militaries. However, like traditional militaries, these sideline groups have evolved.

The West holds some stereotypes of nonconventional combatants: that they all use AK-47 machine guns, old Soviet RPG launchers (rocket-propelled

grenades), and the infamous IEDs, or homemade bombs, to harass invaders. Due to constant news coverage and stories from the Middle East, most Americans would connect this type of warfare to extremist Muslim groups. The tales of suicide bombers have become all too commonplace on the nightly news. However, this type of fighting neither is confined to the Middle East nor represents the extent of these groups' capabilities.

In *The New Face of War* (2003), Bruce Berkowitz describes a friend, a reporter, who bought a computer from a pawnshop while covering the conflict in Afghanistan. The pieces for his new computer had all come from a PC that was looted when al-Qaeda forces were routed and pushed into the mountainous areas near the Afghanistan-Pakistan border. Recognizing his luck, the reporter sent the hard drive to a computer specialist to crack and retrieve the information. What he found on the hard drive was a plethora of plans and communications of incredible complexity. It should be understood that the terrorists who owned that computer represent the majority, and not the minority, of modern nonconventional threats. Antulio J. Echevarria, in her work *Fourth-Generation War and Other Myths* (2005), debunks the legitimacy of the 4GW theory, although she concedes that it is tempting to see new, nontraditional combatants as a brand-new and trendsetting threat simply because they are so far from the cave-dwelling nomads with AK-47's that many believed they were.

Asymmetric soldiers have access to such a wide range of technology and are so mobile that they are able to strike almost anywhere. In his award-winning research on nuclear disarmament, Ward Wilson argues that nuclear weapons are most useful to those (perhaps useful only to those) aiming to spread terror. Governments are justifiably worried about terrorist groups acquiring weapons of mass destruction. In the 1960's the United States was forced to fight asymmetric warfare against national communists in Vietnam; however, the Vietnamese were incapable of striking at the American people. The situation has changed: In 2010, militaries and governments must prepare to fight a new breed of nonconventional opponent who is globally mobile and capable of massive attacks on civilians.

Militaries of today face the constant pressure of modernization and preparation. If there is any single military truth that has made its way through history and is unlikely to change soon, it is that militaries must constantly evolve. Not only are traditional militaries expanding their capabilities; even nonconventional military forces are expanding and adapting their strategies to gain the upper hand. This element adds a new level to an already difficult and expensive competition. Today the threat from the nonconventional opponents is perhaps the most pressing.

To meet these threats, foreign and domestic militaries will continue to adapt. They will buy more robots, build more ships, acquire new long-range cameras, piece together new tanks, and develop new tactics and technologies. The militaries will continue to evolve—as they must. The militaries of 2010 are our militaries of today; however, with phenomena like global reach, network-centric warfare, airplane drones, and combat robots, the capabilities of some advanced militaries embody our ideas of the future.

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Bryan Buschner

UNCONTROLLABLE FORCES

Geography, Weather, and Warfare

Some Geographic Considerations

Warfare takes place within natural contexts that humans can do little to affect. Whether in military action, gathering to fight, campaigning, or fighting in pitched battle, geographical factors such as terrain, food resources, water, weather, and climate have all played major roles in shaping the nature and conduct of organized human conflict. Natural features such as swamps or marshes, ore fields, natural harbors, and mountain passes, or human-made features such as roadways, cultivated fields, and cities have provided both the means for waging war and the targets of territorial aggressors.

Natural resources dictate the availability of military matériel: wood for ships; plentiful grass for herds of horses; and iron, copper, or tin for weapons. Geographic access is necessary for trade that can enhance natural resource deficiencies, and natural trade routes themselves can become military targets, for either control or plunder. In the premodern world, climate tended to dictate where people congregated, and weather tended to restrict military campaigning to the summer months between spring planting and fall harvest.

Human interaction with the landscape shaped the course of warfare in China, the West, and other rather limited regions in the premodern world. Organized cultivation of the land provided rich stocks of food that attracted hungry nomadic peoples who took what they wanted and were able to take. Walled cities, in which people, wealth, and industry concentrated, developed both defensive and offensive capacities that revolutionized military thinking and action. Developed ports became wealthy points of trade and colonial expansion, as well as cradles of naval development and warfare, especially around the Mediterranean basin. Chinese, Persian, Roman, and Incan roads channeled armies quickly within their empires, enabled rapid communication, and consolidated expansion into neighboring areas. Bridges afforded the easy crossing of natural obstacles such as rivers and gorges. Fortification of natural strongpoints along frontiers, coastlines, and travel routes defended political boundaries and economic interests. Finally, great walls such as those of China and Rome's frontier in Britain clearly marked territory and limited depredation by invaders.

Military technology and the changes in thinking and fighting that both drive its development and are in turn affected by it seem to have evolved most rapidly and thoroughly in regions of the world where geographical access encourages contact among varied human groups. Natural obstacles such as heavy forests, jungles, deserts, and mountains tend to insulate peoples from one another and place limitations on effective interactions among even neighboring groups. Where mobility is limited, advances in military technology (and, arguably, in all phases of technology) are likewise limited. Even far-ranging contact by sea, such as that of the Athenians, Vikings, or Polynesians, revolutionized neither the native peoples nor the colonizers. Across the face of the great Eurasian landmass, however, the use of metallurgy, wheeled vehicles, cavalry, and gunpowder technology spread and found ready acceptance along the way. Perhaps because the Western peoples—from Persia to Britain and from Scandinavia to the Sahel—remained in some form of sustained contact from the mid-first millennium B.C.E. through the Persian, Hellenistic, Roman, Celtic, and Islamic empires, major technological innovations developed, took hold, and spread rapidly. Aside from the lack of major geographic obstacles to invasion—the Alps are passable in summer and the Mediterranean is as much a highway as a barrier—early urbanization and intense rivalries both within and among regions account for much of this dynamism.

A range of shifting political and even religious foundations for warring societies may also have played a part in military development. In Mesopota-

mia, Akkadian king Sargon the Great (c. 2334-2279 B.C.E.) melded the independent, feuding city-states into an empire and created the core of a limited imperial army drawn from throughout the region. In their movement from kingship to functional democracies to imperial subjection, the ancient Greeks shifted from an organization of heroic warriors to a phalanx of citizen shock troops, a force of multiethnic mixed arms with a heavy reliance on cavalry. The Greeks' proximity to and contact with their many neighbors, such as the Persians, Egyptians, Romans, Etruscans, and Carthaginians, resulted in trade, competition, and conflict that necessitated unprecedented innovations. Not least among these areas of development were naval technology and strategy. Rarely outside the West was sustained land and naval competition so fierce and so regular.

Religious considerations drove the Hebrew people to conquer and dominate much of the Levant, and the terrific successes of Islam stemmed far more from aggressive religious fervor than from military innovation or organization. The conflicting desires to create a territorial Hebrew promised land, to spread the Dar al-Islam, and to reconquer the same promised land for Christian purposes from the Dar al-Islam all speak to the geographic expressions and impulses upon which Western religions as well as political entities have relied. The same religious zeal also applied to the Crusaders who were fighting in terrain that was generally unfamiliar, and in far hotter weather than they were used to in Western Europe.

GEOGRAPHIC RESOURCES AND WARFARE

Humans have certain needs for food and shelter that nature must supply. Historically humans largely have occupied a zone of the globe in which climate is conducive to food crops and extremes in temperature and weather are minimal. Some communities shifted from hunting and gathering to herding or domesticating animals and cultivating the soil. After settling in one place, people began to create and store food surpluses and to build permanent shelters. People who remained wanderers (nomadic peoples) or who were perhaps displaced from their own settlements preyed upon these centers of primitive wealth, necessitating the construction of defensive walls and the earliest cities.

Although cattle raids among the Irish, described in the Irish epic *Táin bó Cúailnge* (late eleventh or early twelfth century; the driving off of the cows of Cooley) exemplify the precivilized expression of tribal rivalry, struggles over cultivated lands and the cities they sustained typified warfare in the ancient world. Surplus in food led to the creation of other forms of valuables through specialization of labor. In some of these settings, warriors stood apart from cultivators, protecting them and living off their labor. In others, the cultivators themselves served as soldiers, denying a basic class distinction. In either case, the initial impulse was defensive, although in the former, the urge to display one's virtues as a warrior or leader may have fueled rivalries or conquests of neighboring lands. In many cultures that practiced primitive warfare, conflicts were strictly limited, highly ritualized, and sometimes relatively bloodless. Resources might have been exchanged but not destroyed or plundered outright. Because of the traditional nature and functions of these battles, little change took place over time. The likeliest events to upset rituals and shape new forms and meanings for organized conflict were major environmental changes (such as disease or sustained weather problems), inmigration, or conquest.

Warrior societies were generally poor materially and relied upon predation for their own wealth. They evolved among cultivators of poor soil, as in the case of the Vikings, or from herdsmen, as did the Central Asian peoples of the steppe. In both of these cases the warriors gained tremendous mobility from clinker-built longships and mounted horses, respectively. In both Viking and steppe nomad societies, trade was as important as plunder, but their native territories provided little of value to others. These warrior groups ranged widely and sought to despoil where defenses were weak; they shared no ritual niceties with their enemies and terrified the people who did. With limited resource bases of their own and without any clear sense of territoriality, these groups could not take and hold power for any sustained period without adapting

to the material and social cultures of the conquered, as did the Mongols in China and the Vikings in Normandy. They also chose areas particularly vulnerable to their method of fighting. For the Vikings, the villages near the coast or in river estuaries were regularly attacked, and for the Huns and the Mongols, the open plains of southern Russia had little to inhibit their cavalry.

Geography and Empire Building

Long-term military success lay, in ancient times, with those who controlled resources and the means of transforming some of them into weapons. Those societies with this power were able to consolidate and control territory that contained raw materials and to defend it from invaders. Indeed, territorial lordship seems to have evolved out of these needs in the Nile Valley, Mesopotamia, China, and parts of the Indus Valley. Land-based empires tended to expand into contiguous areas until forced by geography to halt or to vault barriers. The deliberate expansion of Rome in Italy, of Alexander in the Persian territories, of the Franks in Western Europe, and of Islamic warriors along the Mediterranean littoral and into Persia all followed this pattern.

Lands with valuable resources or connections to other such territories were brought under political and military control. This was one of the reasons for the Carthaginians holding onto Spain and its silver mines, and the Romans keen on attacking England to take control of tin. With trade and ultimately colonization, a society could transcend both its own home territory and its direct neighbors to draw upon far-flung resource centers. Early examples of such societies are the Polynesians, Greeks, Phoenicians, and later the Carthaginians. Seaborne Arabs sailed the Indian Ocean. In more modern times, the Spanish, Dutch, and English all expanded their territory to acquire resources. In each of these cases, expansion into immediately neighboring territories was unfeasible, undesirable, or thwarted, and maritime and naval technology opened distant doors.

The expansion of land-based empires relied upon superior technologies and skillful uses of them, and military organization that could allow operation at a distance from home bases. It also could require adaptation of tactical and sometimes strategic assumptions and factors. Assyrian and Hyksos warriors created and ruled their empires from horse-drawn chariots. Alexander the Great's (356-323 B.C.E.) combination of sarissa-wielding phalanxes and superb cavalry spelled the end for the Persian charioteers and lightly armored infantry. Frankish heavy cavalry bested the lighter Arab horsemen on open fields in central Gaul, and the articulated Roman maniples maneuvered skillfully through rough Italian mountain terrain in ways no massed phalanxes could have. Roman soldiers were also road-builders and connected their conquests directly with urban supply bases and ultimately with Rome itself.

The Assyrians were apparently the first people systematically to utilize protected lines of communication, supply depots, and baggage trains. Alexander's widely ranging army often relied upon supply from both coastal ships and stocked depots, and they suffered tremendously when these failed them. Persian king Xerxes (c. 519-465 B.C.E.) lost his bid for control of southern Greece when his supply ships and their escorts were destroyed at Salamis in 480 B.C.E. In his fourth-century B.C.E. *Bingfa* (c. 510 B.C.E.; *The Art of War*, 1910) the Chinese military theorist Sunzi (Sun Tzu) recommended that the armies of invading commanders carry their own equipment from the homeland but rely on enemy lands for provisions.

Seaborne empires require unobstructed sailing channels that connect the home ports to those of the colonies. Ships had to be adaptable for either trade or battle and ideally could carry on both simultaneously. Ships sought either friendly or directly controlled ports as safe havens along the routes, and those that harbored hostile ships were given a wide berth. Open sea could not be controlled effectively, and individual ships were very vulnerable to predators either alone or in groups. Control of surrounding land could be a factor protecting shipping, but, as Venice discovered in its own Adriatic Sea, it was no guarantee of insulation from bold, swiftly moving enemy fleets.

Ports, as interfaces between land and sea, enjoyed

the strengths and weaknesses of both elements. A stout wall, such as that of Constantinople, could hold enemy armies at bay indefinitely, while supplies could flow in from the sea. A blockading fleet could bottle up the harbor, but unless an army controlled the land approaches to the city, its hinterland could provide for its needs. By its very nature a port city was likely to be well stocked in needed provisions and thus likely to withstand any but the most determined siege. Constantinople fell only when the Turks brought to bear cannons that were capable of breaching its land-side wall in 1453. Ports were, however, vulnerable to raids by fleets that were naturally invisible in the vastness of the open sea or that lay in wait in nearby friendly waters. Before telescopes and artillery, there was little time between spotting raiders and setting out a naval defense, and no way of striking back beyond a bow shot.

Throughout history, invading groups have been drawn to the rich ports of Mediterranean mercantile nations: Iberian pirates in the first century B.C.E., Vandals in the sixth century C.E., Arabs in the ninth, Vikings in the tenth, and feuding Genoese and Venetians in the fourteenth. As trade and conquest extended out of the Mediterranean, ship technology evolved to accommodate oceanic conditions and eventually transoceanic voyages, by which time shipboard cannons and small arms had begun to replace crossbows and javelins. There is an interesting parallel between the development of weapons for use on land and those for sea warfare: Most weapons used at sea were first developed for land fighting. Even the ramming prow began as the battering ram; the Roman *corvus* as a siege tower bridge; Greek fire as a weapon against wooden gates. These modifications make sense if one views a ship as a small, mobile castle at sea.

U.S. Air Force

U.S. and coalition aircraft fly over the southwest Asian desert in 2003.

Although the creation and maintenance of seaborne empires required resources and techniques of attack and defense rather different from those of land-based ones, the fundamental human needs for movement, provisions, and effective weapons remained the same. When peoples such as the Persians, Romans, Arabs, or Byzantines could manage the resources to afford both formidable armies and fleets over the long run, the power of their empires was awesome. For some, such as the fifteenth century Chinese, the matériel was there, but the will to project power and awe was not. For others, such as the Phoenicians and later Carthaginians, vulnerability of the home base spelled doom, while Athens and its empire suffered defeat in the Peloponnesian War (431-404 B.C.E.) when the superb Spartan army allied itself with the Persian fleet.

Geography and Mobility

The ability to build and manage ships enormously enhanced people's ability to treat water as a pathway rather than an obstacle. Wide rivers provided easy downstream movement and ready, if difficult, upstream travel and shipping. When an army in motion needed to cross a river, its width and depth determined the means. When fording proved impossible, bridging on pontoons, usually small boats lashed together, did the trick. The Assyrians were apparently the first to use regular bridge engineers, and the Carthaginians used makeshift bridges during Hannibal's invasion of Italy. However, the Romans developed efficient bridging on the march into an art form. Permanent bridges, though, provided ready access for enemy armies coming from the opposite direction and had to be fortified or guarded with care. Armies could also be ferried across broad expanses of river, but boats brought to or created on the scene were necessarily quite small and light.

Armies that could not use ships to attain their goals were forced to use land routes to maneuver, within both their own and enemy territory. When in motion, the premodern army relied predominantly on human feet and legs, which could traverse a wide variety of terrain and cover great distances when provisions were at hand. Pack animals that could cover the same ground carried supplies but required fodder, which was either carried or found along the way. The Macedonian armies used servants as carriers, but the Roman legions employed about eight hundred pack animals for each legion. Part of the reason for these differing choices may stem from the Macedonians' heavy reliance on cavalry: limited fodder went to Alexander's war horses instead of pack animals. Sledges provided platforms on which provisions and supplies could be carried, dragged by either human or limited animal power.

After armies began using wheeled conveyances, the need arose for fairly smooth and consistent pathways unrestricted by obstacles such as strewn rocks, swamps, or overly steep or narrow passages. Unpaved roads, as found in the Persian Empire, proved perfectly passable in good weather but turned into muddy morasses when heavy rains came. Romans and Chinese created artificial surfaces that retained the road's integrity in all but the worst weather. Carts might be drawn by people or draft animals, such as oxen. The use of horses did not become widespread until after breeders had developed animals of suitable size and strength, and carters had created appropriate harnesses. Progress at human and draft animal speed was steady but slow on easily traversed terrain without steep grades and somewhat faster on paved roadways.

Before horses were ridden, they were harnessed to light chariots. Developed earliest on the Iranian Plateau, horses provided warriors and soldiers much greater speed and range, both prior to and during battle. Organized aggression on a large and mobile scale began with the charioteers. Flat, hard terrain was a necessity, however, and chariots triumphed only where this was in abundance: in Mesopotamia, China, Egypt, and parts of Celtic Western Europe. Before battle, Persian soldiers swept and leveled the field to aid the maneuver of their wheeled warriors. Aryans initially invaded the Indus Valley in chariots, and Mycenean Greeks and Etruscans also used war chariots, but the rocky geography of Italy and Greece limited their usefulness in large formations. Chariots provided platforms from which to shoot arrows or hurl missiles and could easily run down broken formations of lightly armed infantry. Although the fielding and maintenance of a corps of chariots was an expensive proposition, chariot warfare became a standard part of empire building in both China and western Asia. Horses needed large amounts of grass or grain, however, and when dessication set in, as in Mesopotamia, their days were numbered.

Where the availability of grasses allowed, horses were eventually bred, raised, and used for cavalry, first perhaps on the Iranian Plateau around 1400 B.C.E. By around the eighth century B.C.E. horses with backs strong enough to be ridden forward, rather than on the haunches, provided people of the Eurasian steppe between the subarctic northern forest and the great Asian deserts with devastating power and mobility. These horse people had the run of their own vast areas of grass, but were drawn to the civilization and wealth of India, China, and the West. Scythians, Cimmerians, Huns, Mongols, and Turks each in turn

terrorized civilized peoples and forced them to adapt to the horseman's threat. However, these were culturally nomadic peoples, and only those Mongols settling in China and those Turks remaining in Asia Minor were transformed into a stable populace. The mobility of the steppe nomads provided their freedom and defined their military tactics: bow-, sword-, and spear-wielding hordes aligned in a great crescent that thundered across the open plain. They were quick to fire their missiles and disperse, reforming and charging again as needed. They could bleed or milk their mounts for food, and as long as the grass was plentiful, they could maintain their control. Beyond the steppe, however, they could not long survive without adapting or retreating.

Arabs and Europeans adopted cavalry as an arm of mixed-force armies, and Western armies gained clear, if limited, mobility from the use of cavalry. Islam was spread as quickly as it was by fervent horsemen who established both the religion and its rulers from southern Gaul to India. These Islamic warriors arrived in desert areas by camel and fought on horseback. Their goal was not territorial conquest per se, but the diffusion of the truth of Islam and worship of Allah. Yet their tremendous mobility spurred the post-Roman West to create its own cavalry, with enormous repercussions for medieval European society and politics. Western cavalry units were quite small relative both to those of the steppe hordes and to the size of their own societies because local Western economies were settled and agricultural rather than nomadic. The warrior class was supported by the agricultural and trading classes, and the European idea of the chivalry of the mounted knight dominated in Europe as part of a larger social, political, and economic reality.

When horsemen introduced themselves into areas previously lacking in horses, such as South Africa, the Americas, and Australia, the enhanced range and speed, as well as accompanying firepower, gave these invaders a huge advantage over local warriors. Nonetheless, areas of extreme heat or cold and mountainous, heavily forested, jungle, and swampy regions have all proven inhospitable as theaters of operation to bodies of cavalry.

In general, the same routes that provided the most direct pathways for merchants, pilgrims, diplomats, and migrating peoples also served the needs of campaigning armies. The paths of least geographical resistance have been trod for centuries, if not millennia. Just as cities are rebuilt time and again upon the ruins of their predecessors for reasons of geography, so battles will repeatedly occur on the same spots as armies vie to enter or defend territory that retains its importance. If the province of Edirne, formerly Adrianople, is the most contested spot on the globe, however, it is not because of its natural resources, but rather because of its position along the southern bridge between Europe and Asia. Similarly, the southern region of Israel has seen conflict from the ancient Egyptians attacking northward, their enemies the Hyksos and later the Hittites moving south to attack Egypt, the Macedonians under Alexander the Great, the Selucids in the Diadochi Wars, the Romans, the Seljuk Turks, the Crusaders, and the Ottoman Turks, as well as, many years later, the French under Napoleon I, the Allies in World War I, and the Arab-Israeli wars of the second half of the twentieth century.

Similarly, in northern France, conflict in that region in the Hundred Years' War (1337-1453) was only a harbinger of future wars: the Wars of Religion (c. 1517-1618), the War of the Spanish Succession (1701-1714), the War of the Austrian Succession (1740-1748), the Seven Years' War (1756-1763), the French Revolution and Napoleonic Wars (1793-1815), and World War I (1914-1918), which have all involved fighting in a relatively small area of land. Nature has provided the obstacles to human movement as well as the highways along which the armies of the world have campaigned.

TERRAIN AND WARFARE

In *The Art of War*, Sunzi stated, "Those who do not know the conditions of mountains and forests, hazardous defiles, marshes and swamps, cannot conduct the march of an army." Of Sunzi's five fundamental factors of war, two are geographical: climate and terrain. The fifth century Roman military historian Vegetius posited that each of Rome's major military

arms had its own terrain-specific role: the cavalry had the plains; the navy had seas and rivers; and the infantry had hills, cities, and flat country. The peoples of the great riverine civilizations of China, India, and the West created the great armies of conquest and consolidation. The peoples of the littoral regions of the Aegean, the northern fjords, Oceania, and the Indian coast sent out their seaborne forces for trade, plunder, and colonization. The steppes bred and unleashed on the world the nomadic hordes of charioteers and horsemen. The open terrains of plain, sea, and steppe fostered types of warfare that pitted relatively mobile forces against fixed targets, such as towns, ports, castles, and walls; highly mobile forces, such as fleets and cavalries, against one another; or relatively static armies against each other on the battlefield. Less open terrains, such as mountains, swamps, heavy forests, or jungles, called for conflicts in which neither the massing of troops nor the nimble maneuvering typical of other settings was desired, or even at times possible. Poorer terrain tended to be economically poorer as well, and war tended to flow out of these areas into the wealthier and literally more attractive regions. Territorial defense by the world's early civilizations often meant pacifying the surrounding hills and forests occupied by these outsiders.

Warriors who developed their skills in these less accessible areas had often acquired tactics and weapons that complemented those of the larger armies they joined, as either allies or willing captives. In general, fighting men from these marginal regions were considered "irregular," whether fighting or joining highly organized armies. Mountain and forest terrain lent itself to relatively small, highly mobile, independent parties who would strike and retreat quickly. Such fighters often proved resistant to both authority structures and the discipline necessary to phalanx warfare. Their fluidity and their tendency to raid and ambush, major parts of their strength, have frustrated regular troops from ancient Persia to twentieth century Vietnam. Tu Mu, a ninth century commentator on Sunzi, suggested avoiding or at least scouting areas of danger to chariots and armies: mountain passes, river crossings, and the places where vegetation is luxuriant.

The use of javelins, bows, and slings enabled irregular fighters to engage at a distance, ensuring a buffer that allowed for escape when necessary. The Chinese, Persians, Macedonians, and Romans all incorporated irregulars into their service, adding a needed dimension to their infantry and cavalry arms. The wilderness areas from which irregulars came also provided places of resistance and refuge in times of upheaval or invasion. The difficulty of operating either deterred incursion by regular armies, hampered it effectively, or led to disaster, as in the Teutoburg Forest in 9 C.E., when Germanic warriors annihilated a Roman army that had pursued it too far. In that instance it is thought that the Germans allowed the Romans to enter a narrow defile where the numbers of their attackers would lead to a German victory. Similarly, at Agincourt in 1415, a much smaller English force was able to defeat a larger French one.

By the time of the first Sack of Rome (410 C.E.), the Roman soldier had become increasingly barbarized and was expected to wield the sling, bow, and even darts. Flavius Vegetius Renatus recognized the barbarian origins of the sling in the Balearics and suggested its use derived from the waging of war in stony places. He cited the need for mounted archers to count the same among their enemies and mentioned the origin of the "lead-weighted darts" among the Illyrians. Vegetius also recognized the untrained and undisciplined nature of the *auxilia* soldiers drawn from diverse barbarian peoples. Roman adaptation to the strengths and weaknesses of their enemies had evolved by Vegetius's time, so that the use of concealment and ambush played major roles in his thinking. He believed that good generals would not attack in open battle where the danger is mutual, but rather from a hidden position. Similarly, when the Welsh nationalist leader Owain Glendower faced the English army near Worcester in 1405, neither was prepared to move from a defensive position, and hence no battle was fought. The nature of the battlefield is also of major consideration to the commander and should be studied with regard to its appropriateness to either the cavalry or the infantry.

The difficulties of forcing large groups of foot soldiers to cross desert environments meant that battles

in truly desert terrain generally occurred between bodies of men on camels or horses. The heat and lack of water allowed for armies of only limited size, and generally lightly armed and armored characters took part in desert warfare. On the fringes of these areas fought the Byzantine cataphracts and crusading knights, relatively heavy shock troops whose enemies generally wielded the bow and maneuvered agilely into the desert wasteland itself when retreat was warranted. Fluidity and expectations of minimal gains influenced their tactics and strategies, as they did peoples of the mountains and forests. From horseback slings, bolos, and even lassoes could be used by light cavalry to hamper heavy formations in open fields.

CLIMATE, WEATHER, AND WARFARE

In temperate zones early military campaigning was generally a summertime activity, conducted by civilized peoples between the spring planting and the fall harvest. For professional armies, the winter season presented conditions of cold, wind, and precipitation that were best avoided. In spring, flooding rivers often proved impassible, and spring and fall rains turned marching routes into morasses. Chinese, Incan, and Roman roads alleviated some of the last inconvenience, but seasonal campaigning remained the norm. Vegetius recommended conducting naval maneuvers only between late May and mid-September. Foul-weather attacks presented both risks and the opportunity for surprise. Long-term sieges of cities or fortresses had necessarily to last beyond the campaigning season, and while the inhabitants often suffered from lack of food and other supplies, those blockading, relegated to second-class field quarters, often endured worse. Sunzi, who always argued against protracted warfare, advised against sieges of cities under even the best of conditions.

In hotter zones periodic monsoons made military maneuvers all but impossible, and desert conditions affected the size, movement, and armament of military bodies. The Crusaders quickly found that their heavy armor was a deadly encumbrance rather than an aid in the Levant. Lighter clothing and lighter armor characterize warm-climate warriors and soldiers. As such, lighter weapons could kill them. Native allies often became very important when an empire struck too far north or south from its homeland, and adaptations to local conditions became mandatory. Deaths from dehydration, heat stroke, and unfamiliar diseases had to have been plentiful when men from the temperate zones marched south. One explanation for Attila's (c. 406-453) refusal to march south into Italy is his fear of the area's summertime heat and disease.

Ships at sea are far more vulnerable than land armies to occasional storms, and occurrences of storms breaking up large fleets are not rare in ancient chronicles. Perhaps the most famous is the *kamikaze*, or "divine wind," that destroyed the Mongol invasion fleets that threatened Japan in 1274 and 1281.

It is similar, in some ways, to the divine wind that brought, according to legend, William of Normandy's fleet to England in September, 1066, although modern historians have suggested that his reasons for delaying the attack were not solely dictated by the weather. In spite of these recent reservations about William's actions, conditions on the English Channel were sufficiently variable for the Allied Command for the D-day operation to consult weather forecasters on a daily basis to work out the best time to launch the invasion of France in June, 1944. Prior to the use of professional weather forecasters, soothsayers and fortune-tellers were consulted.

THE HUMAN LANDSCAPE

The development of cities, more than any other human activity, focused military aggression and provided the means for increasing the scope and deadliness of warfare. Cities became targets of predatory nomadic peoples and of each other. Banded together under a single leader, the combined surpluses of a city provided the wherewithal to carry on protracted campaigns of conquest. Between cities stretched roads along which merchants and armies traveled, and urban wealth grew with the trade that followed. The oldest known urban place, Jericho, sported walls

U.S. Coast Guard

More than 100,000 American and British soldiers landed on the Normandy coast of France during the D-day invasion of June, 1944, overcoming the challenges of an amphibious assault.

in its earliest form: walls clearly meant to keep out challengers. The desire to defend and defeat these human landmarks led to an entire branch of military science. Like cities, fortified outposts within which soldiers huddled to defend frontiers and approaches developed defenses appropriate to current siege technologies. At the extreme, these developed into curtain walls.

For Sunzi and his commentators, cities were, like other geographic obstacles, to be avoided by the campaigning army. When cities or large fortifications were not the objective, careful consideration had to be made in deciding whether to attack. Unlike mountains, forests, or marshes, cities and fortifications certainly held people, and probably armed men who could cut supply and retreat lines. The Chinese seem to have assumed rather quick and shallow offensive sallies, on which their supply lines and escape routes would be minimally vulnerable. Alexander was willing to bypass strongholds, the major exception being Tyre, which he besieged at a great cost in time and energy from January to July 332 B.C.E. Empires and kingdoms tended to fortify along their frontiers, leaving the interior relatively unprotected. The decision of the Roman emperor Aurelian (c. 275-215 B.C.E.) around 270 B.C.E. to build up the city of Rome's walls speaks to the Romans' very real fear of the Germanic tribesmen, as distant as they were. After all, fortified cities were needed along the imperial boundaries, not deep within. Where and when the political geography was fragmented—as in classical Greece, China during the Warring States period, feudal Europe, and Renaissance Italian city-states—every center was vulnerable and had to be defended.

Few premodern city walls were spared the experience of siege, and great innovations accompanied the evolving practice of siegecraft. It has been suggested

that the first true professional soldiers evolved from the need for protracted and well-organized sieges. Professional soldiers were neither elite warriors nor citizen soldiers. They brought the patience and skill necessary to invest a fortified area successfully. Weapons and techniques for gaining forced entry developed as simple blockades of city gates proved of little practical use. Egyptians may have used battering rams as early as 1900 B.C.E.; siege towers were depicted from the eighth century B.C.E.; and catapult-like machines for hurling projectiles against the walls or into the protected areas emerged in the fourth century B.C.E. The use of scaling ropes and ladders and the practice of undermining walls are probably of even greater antiquity: The earliest levels of Jericho show signs of a dry moat. Other methods of defense included bastions that jutted out from the walls to provide flanking fire by archers and others; towers that protected vulnerable corners and gates; crenellations; machiocolations; battering (sloping out) of wall bases; and, at least during the high Middle Ages, increasingly ingenious ways of defending gateways. Like other types of military technology, siege engines and defensive forms migrated: The round towers and curtain walls of Edward I's (1239-1307) Welsh castles have their origins in the Islamic Near East.

Geography above all other considerations determined the locations of cities and fortifications. When defense was a major factor, location on hills or along ridges provided the best position from which to resist and repel attackers. After laying siege to Celtic and Etruscan strongpoints, the Romans either destroyed them or forced the inhabitants to move to the valley below, as, for example, at Gubbio in Umbria. Here the medieval citizens relocated to the side of the hill, where the main civic structures remain. Human needs also dictated sufficient living and storage space, a source of fresh water, and easy access in time of peace. When garrisons were consistently small, as in the Roman forts along the Saxon shore or along the frontier of the Sienese Chianti, the needs were small and there was little need for growth. As fortified cities expanded, however, the urban geography changed as the location of the site became less important than the human alterations to it.

Strings of forts marked the Incan and Roman frontiers, but the greatest expressions of the siege mentality were the great walls of the Roman emperors Hadrian (76-138) and Antoninus (188-217) in Britain, and the crowning achievement of Chinese engineering, the Great Wall. The Great Wall stretches for some 4,000 miles and initially linked a series of hilltop fortifications along a border of steppe and mountain, wilderness, and civilized terrain during the Qin (Ch'in) Dynasty (221-206 B.C.E.). Climatic shifts in the region to and from desertification made its reinforcement of a natural physiological boundary irrelevant, and the Great Wall's failure to hold back the Mongol advance is legendary.

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Joseph P. Byrne

CULTURE AND WARFARE

Art and Warfare

Overview

"War art" is a form of artistic expression with warfare as its subject. Historians of art as well as military historians have traditionally interpreted war art in purely mimetic terms, defining it by what they believed it represented: the timeless essence of war. This understanding of war art led to studies that focused on the continuity of the representation of war throughout the ages rather than on culturally specific differences. More recent studies of war art have begun to acknowledge that both war and art are expressions of specific times and places, and scholars are finally acknowledging the role of cultural change in shaping the understanding of both art and war.

Significance

The cultural turn in the study of war art is important for a number of reasons, not the least of which is that it forces a reconsideration of the complex relationships among art, war, and culture. Furthermore, this change of focus in regard to war art leads to increased reflection on the understanding of change and continuity throughout time. War art has followed a progression over a broad expanse of time, from the ancient world to the present day. The discussion of this progression below is far from comprehensive, but it offers a window into key moments in the evolution of war art.

History of Art and Warfare

Ancient World

Visual representations of war first appeared around 4000 B.C.E. in cave paintings later uncovered in northern Australia; these paintings show what are believed to be groups of warriors hurling spears at each other. War art did not become prolific, however, until the emergence of the Sumerian culture in Mesopotamia (c. 4000-2340 B.C.E.) and the cultures of ancient Egypt (c. 2920-1070 B.C.E.). The artifact known as the Royal Standard of Ur or the Standard of Ur (c. 2600-2400 B.C.E.) shows the chariots of the Sumerian king's army returning to him with the spoils of war, including prisoners, while the king stands motionless at the center of the top panel of this three-paneled work. The king's position in the image highlights his absolute power; all things begin and end with him. The ancient Egyptian artifact known as the Palette of King Narmer (c. 3150-3125 B.C.E.) conveys a similar message of imperial power, but here the king is seen taking direct action: He holds his enemy with one hand while preparing to strike with the other.

Later cultural productions from Greece and Rome did not differ greatly in message from these earlier works, but they moved toward a more sophisticated representation of warfare. The north frieze of the Treasury of the Siphnians, located at Delphi in Greece, is known as the Battle of the Gods and Giants (c. 530 B.C.E.). Despite the mythical subject of this work of art, viewers can envision the battle with much greater facility than they can with such earlier representations of war as the Royal Standard of Ur. Men engage in hand-to-hand fighting in this scene, using swords and spears, and an animal is even depicted biting into the side of one of the soldiers. The realistic portrayal of mythical battles was continued by the Romans, but they began to include elements of more recent history in their war art as well. One example of this Roman method of representation can be found in the *Ara Pacis Augustae* (c. 13-9 B.C.E.), a large sculpted marble altar that was commissioned by the Emperor Augustus (63 B.C.E.-14 C.E.) to celebrate the peace brought about during his reign. The figures on the north and south walls of the altar represent the various segments of Roman society, including the family of the newly crowned emperor, while those on the east and west sides depict episodes from

Roman mythology. Together these scenes are designed to create the impression of peace and stability, but they also suggest imperial power. The *Ara Pacis Augustae* illustrates that war art in the ancient world was primarily a matter of putting state power on display. Consequently, most ancient war art was what today would be considered public art; it took such forms as temples, sculptures, statues, territorial markers, and royal burial chambers, all of which highlighted the role of the ruler as the guarantor of both victory and peace.

MEDIEVAL WORLD

In the medieval period (476-c.1400), war art continued to illustrate the power of the monarch in matters of peace and war, but the added element of Christian belief meant that the secular king would have to share his power with God. Since secular power was subordinate to divine authority, one of the primary sources for war art in this period was the Bible. Medieval Bibles were extensively illustrated with both stand-alone plates and images skillfully blended into the text. Of these "illuminated manuscripts," the Maciejowski Bible (c. 1250), also known as the Morgan Bible, contains some of the most graphic imagery of war found in the art of this period. One set of illustrations depicts the death of King Saul and his sons at Beth Shan. Saul's body hangs headless and partially naked in the top left-hand corner of the page, dominating the viewer's attention. Careful examination of the

North Wind Picture Archives via AP Images

Eugène Delacroix's Liberty Leading the People *commemorates the July Revolution of 1830.*

Time & Life Pictures/Getty Images

Francisco Goya's Third of May 1808: Execution of the Citizens of Madrid *(1814).*

four illustrations reveals the story that explains Saul's gruesome death and the presence of his headless and naked body on the edge of the page. The top two panels show Saul's beheading and the Philistines then raising his headless body above their ramparts as a trophy of war. The two bottom panels show the bodies of Saul's sons being burned and the head of Saul being brought to the Philistine king. The Maciejowski Bible is the product of a world consumed by religious wars, but, like most illuminated manuscripts, it does not make specific reference to contemporary events.

Biblical and Christianized images borrowed from earlier classical texts were the primary subjects of war art in the medieval period. It was not until the emergence of the Renaissance (c. 1400) that historical subjects began to reappear in war art. The painting *The Battle of San Romano* (1454-1457) by Paolo Uccello (1397-1475) is an early example of Renaissance war art. Commissioned by the Florentine leader Cosimo de' Medici (1389-1464) to decorate his home, the work depicts in three separate panels a battle that occurred in 1432 between the armies of Florence and Siena. Despite the painting's lack of depth and the stylized poses of the main characters, Uccello's portrayal of a recent battle marks the beginning of the modern period in war art. From this point on, specific battles or historic events associated with battles became regular subjects of war art.

Modern World

Two distinct artistic visions of war emerged following the Renaissance. The first continued in the earlier heroic tradition but was updated to meet the needs of that specific time and place. The second was an entirely new view of war that focused on its unheroic aspects, such as the human cost. Although the artists

who produced both kinds of works were interested in war art as historic record, they had entirely different focuses and understandings of war.

Jacques-Louis David's (1748-1825) painting *Napoleon Crossing the Alps* (1800) represents the earlier heroic tradition, both in the artist's choice of subject and in the work's execution. The great leader Napoleon I (1769-1821) is at the center of this portrait, preparing to lead his armies across the Alps and on to victory. Also seen, engraved into the rocks on which Napoleon's horse stands, are the names of the two military leaders who had previously crossed the Alps with their armies: Hannibal and Charles the Great. David's painting thus places its subject within an ongoing narrative of military leadership and imperial power. Francisco de Goya's (1746-1848) painting *The Third of May 1808* (1814) is more historically specific than David's, as the title tells the exact date of the events portrayed. The shift of perspective in this painting, from military leaders to civilian victims of war, also radically changes the story about war that it tells. Here war is the bringer of sudden and violent death rather than the preserver of an ancient code of heroism. What little heroism the viewer finds in the painting is in the courage of the main character, who, bathed in an eerie light of unknown origin, kneels upon a pile of the already dead as he awaits his own execution by firing squad.

When compared to the majority of nineteenth century war art, Goya's painting is an anomaly. It was not until World War I (1914-1918) that the pathos-laden and unheroic vision of warfare that his painting represents became the dominant artistic mode in the portrayal of war. This shift in focus coincided with the emergence of photography as a new medium of artistic expression. As photographic technology evolved in the twentieth century, it became possible for nonparticipants to view war in something close to real time. One of the more famous photographs depicting a battle in progress is *Loyalist Militiaman at the Moment of Death, Cerro Muriano, September 5, 1936* (1936), by Robert Capa (1913-1954). The viewer does not see the entire battle but only a moment from it and feels like an intruder as well as a participant in the scene. The photo shows a soldier, presumably attacking the enemy, precisely at the moment when he is shot and about to fall to the ground. Capa does not provide any key to interpreting this photo; rather, he leaves the viewer to ponder the reality of sudden death in war.

Something similar happens to the viewer of photographs taken by Eddie Adams (1933-2004) during the Vietnam War (1961-1975). Adams's most famous photograph is of South Vietnamese brigadier general Nguyen Ngoc Loan shooting an unarmed prisoner during the 1968 Tet Offensive. At first glance, this scene appears to represent a moral outrage as an armed soldier kills a crying and unarmed civilian. The reality, however, is far more complicated, as the man being executed in the photo, Captain Bay Lop, was an officer in a Viet Cong cell responsible for infiltrating Saigon. The inability of the still image to explain fully the events of war was partially responsible for the emergence of moving images and mixed-media works as the dominant forms in war art in the late twentieth century. Films, whether fictional or documentary, are better able than other art forms to show war as a complex experience (involving all five senses) that evades easy interpretation. They are the perfect artistic form for the twenty-first century, which is an age less of certainty than of seeking and doubt.

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John Casey

Commemoration of War

Overview

Commemoration relies on objects (such as monuments) and rituals (such as parades) that function as catalysts for remembering specific events. The selection of these catalysts for collective memory depends largely on the values and beliefs of the particular society as well as the nature of the events to be remembered. In the case of war, commemoration has always been challenging, as it is difficult to balance the desire to celebrate victory and martial valor with the equally strong desire to mourn. Modern scholarship on the commemoration of war reflects this age-old challenge, but it also illustrates the radical changes that have taken place in the interpretation of war and shows how those changes have altered the ways in which war is remembered. Personal narratives of remembrance have come to be favored over official state interpretations, as remembering war has come to be understood as the act of memorializing a shared sense of loss.

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The Iwo Jima memorial statue in Arlington, Virginia, commemorates the U.S. Marines.

Significance

An examination of the evolution of war's commemoration is essential to an understanding of the modern perspective regarding war, as the two are inextricably linked. In ancient and medieval times, war was seen as a positive good, and this was reflected in the ways societies chose to remember wars. The Romans named the month of March after their god of war, Mars, and the culture of medieval England incorporated warfare into the fabric of society through the code of chivalry. It was not until the modern period that the view of war as either a necessary evil or the greatest of all disasters came into being, a factor that radically changed how wars would be remembered. The brief and selective history of the commemoration of war that follows shows a few key

moments in this process of evolution in both the understanding and the remembrance of war.

HISTORY OF THE COMMEMORATION OF WAR

ANCIENT WORLD

"Sing, O Muse, of the wrath of Achilles"—thus begins one of the earliest works of Western literature, Homer's *Iliad* (c. 750 B.C.E.; English translation, 1611), which also happens to be a commemoration of war. Documenting events that took place during the Trojan War (c. 1200-1100 B.C.E.), the *Iliad* is a written artifact from an earlier oral culture. In oral cultures the poet was both a priest, serving as an intermediary between the gods and humanity, and the keeper of cultural traditions. War was remembered in oral cultures as part of a larger set of norms and mores that were reinforced with each telling of specific tales.

As writing began to replace storytelling, the commemoration of war moved away from ritual retellings of cultural truisms to fixed objects of remembrance. One example of this change can be found in ancient Rome. The *Aeneid* (29-19 B.C.E.; English translation, 1553), created by the poet Vergil (70-19 B.C.E.), pointed back to an earlier oral culture that was connected to the ritual commemoration of war. At the time Vergil wrote his epic, however, Roman culture was experiencing a massive transition, not only from a republican form of government to an empire but also to a form of memory that relied heavily on public monuments. Although monuments had been part of the communal remembrance of war during the Roman Republic (527-509 B.C.E.), it was not until the early years of the empire and the reign of Augustus (27 B.C.E.-14 C.E.) that they were gradually separated from social rituals. Triumph was transformed from an event into an object. Whereas in the Roman Republic the triumph was a procession of the victorious army through the capital with the spoils of war, in the empire triumph was presented as an accomplished fact. The Column of Trajan (113 C.E.), which was built to commemorate the victory of the emperor Trajan (c. 53-c. 117 C.E.) against the Dacians in what is now Romania, does not require participation to create its meaning. Trajan's victory is already interpreted for the viewer, whose only job is to see and agree with its message. Movement from a republican participatory remembrance of war,

Time & Life Pictures/Getty Images

The Vietnam Veterans Memorial in Washington, D.C., contains the names of American soldiers who died in that conflict, engraved into a wall of polished black marble.

however, to the more passive approach of the empire did not lessen the Roman obsession with victory. Like most ancient cultures, Rome saw little use for the recollection of defeat unless it was that of its enemies. Roman commemorations of war were thus designed primarily to put the state's power prominently on display.

MEDIEVAL WORLD

Unless churches are considered to be monuments, the medieval world contained few public memorials of war. Most of the objects of war commemoration created in this period took the form of hand-illustrated books or interior decoration of churches and castles. Also, with the notable exception of the Bayeux tapestry (c. 1077), which depicts the Norman invasion of England in 1066, early medieval remembrances of war focused on ideal warriors and the chivalric code by which they lived rather than on specific real-world wars and battles. Consequently, many commemorations of battles from ancient mythology and history or the Bible were created. For example, a wall painting in the church of San Pietro al Monte, *Civate* (c. 1100) in Como, Italy, shows the archetypal Christian warrior, the angel Saint Michael, slaying the seven-headed dragon from the Bible's book of Revelation. This image would have highlighted for the medieval viewer the necessary connection between Christian belief and martial valor.

An illustration from the Anglo-Norman poet Thomas de Kent's work the *Book of All Chivalry* (1308-1312) seems to represent a complete departure from the Christian iconography mentioned above. This work's illumination shows a well-known historical scene, Alexander the Great fighting the Persian king Darius, but the text helps the viewer interpret the scene properly. Alexander becomes evidence of the classical roots of the Christian warrior's sense of self, which in turn suggests the universal and timeless appeal of the chivalric code.

Because most medieval authors assumed that their audience would be familiar with the chivalric code, few texts from the early medieval period discuss the code with any consistency or at any length. It was not until the late medieval period that explanations of the chivalric code began to appear. One such text is Christine de Pizan's (c. 1365-c.1430) *Le Livre des fais d'armes et de chevalerie* (1410; *The Book of Fayttes of Arms and of Chivalry*, 1489), which was provided as a guide to the French king Charles VII (1403-1461) and his subordinates. Written at a time when the chivalric code was in a state of decline, this text was intended to ensure not only that wars would continue to be fought in the proper (that is, chivalric) way but also that they would be remembered correctly. Great changes in military science, along with a rising sense of historic consciousness, doomed Christine's project from the start. War was changing dramatically, and so were the ways in which it would be remembered.

MODERN WORLD

Memorials to state power and to ideal warriors did not immediately disappear from modern commemorations of war, but the rising sense of historical consciousness that marked the birth of the modern period led to a greater interest in remembering specific wars and battles rather than timeless ideals. The understanding of history as a force for permanent social change also led to the belief that the names and deeds of ordinary soldiers should be remembered alongside the causes for which they fought. As a result of this specificity, the creators of commemorations of war soon became involved in clashes over the interpretations of particular conflicts.

After the American Civil War (1861-1865), former slave, abolitionist, and orator Frederick Douglass (1817[?]-1895) argued that the Civil War should be remembered as a struggle to free the slaves from bondage. Among the white population of the United States, many Northerners saw the war primarily as an action taken to preserve the nation's political union, while those living in the defeated South thought of the war as the tragic destruction of an entire way of life. A new war over how to remember the Civil War had suddenly replaced the conflict on the battlefields. Over time, however, a compromise was reached. Statues commemorating the common Civil War soldier began to appear in town squares, parks, and cemeteries throughout the United States. These statues largely refrained from interpreting the war; instead they reflected a shared national language of sacrifice.

Such a relatively neutral vision of war also predominated in the monuments created in England to commemorate World War I. "Official" (that is, state) monuments included the *Whitehall Cenotaph* (1920), located near the seat of Parliament in London; the *Cross of Sacrifice* (c. 1918), designed by the Imperial War Graves Commission for cemeteries near the European battlefields of the war; and the *Port Sunlight Memorial* (1921) in Liverpool. These monuments were designed to celebrate English valor and patriotism, but the names of the dead engraved on them remind the viewer that they are also sites of mourning. This juxtaposition of individual suffering and loss with martial valor represents in itself a great change in the nature of modern war commemoration.

Even greater, however, is the growing desire to remember military defeat. The *Vietnam Veterans Memorial* (1982) in Washington, D.C., commemorates a highly unpopular war that ended with what many Americans viewed as a humiliating defeat. A list of names of the fallen greets the viewer at this site; the names, arranged chronologically in the order of death, are carved into a wall of black marble that is set slightly below ground level. This memorial, designed by Maya Lin (born 1959), powerfully displays the human cost of war, but the creation of meaning is ultimately left up to the viewer. The memorial, ironically, represents a move away from monuments and other objects of remembrance and back to a much older participatory form of commemoration.

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Beams of light shoot up from the sites of the twin World Trade Center towers as a temporary memorial to those who died in the September 11, 2001, terrorist attacks.

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John Casey

Film and Warfare

Overview

Film and warfare have been linked ever since celluloid images were first projected onto a screen. The practice of using cinema as a nationalistic propaganda tool is as old as the medium itself. Beginning in 1896, one-reelers consisting of "actuality" footage were part of traveling exhibits. In 1898, films of fabricated "events" of the Spanish-American War (using toy boats floated in a bathtub) were used to sway public opinion in the United States. In Great Britain, the drama *The Call to Arms* (1902) rallied support for the Boer War (1899-1902) in South Africa. The cinema has provided a mirror for the values of its parent societies. Though documentaries offer direct messages, narrative feature films are often a better barometer of prevalent societal values. A film depicting current events is later valuable as impressionistic historical evidence. Audiences often focus on World War II when thinking of war films, but the entire history of warfare has been represented on the screen.

Significance

During World War I, Western society experienced one of the first mass propaganda campaigns of the twentieth century. Leaders in Europe and the United States used the burgeoning mass media to rally support for the Allied war effort. The motion-picture industry, just beginning to develop the feature film and its simplistic conventions, became the ideal medium for this campaign. American film producers, who originally depicted warfare to increase ticket sales, were influenced by those presenting positive views of national preparedness.

Ancient World

Filmmakers have repeatedly been attracted to "historical" subjects. Audiences have been captivated by images of warfare, and films set in the ancient world have appealed to their spirit of adventure. While some war films set in ancient times are based on "historical fact," motivating their makers to claims of "realism," these productions frequently offer more information about their parent societies than about the civilizations depicted on the screen.

The Battle of Thermopylae (480 B.C.E.) between the Greek city-states and Persia is the centerpiece of *The 300 Spartans* (1962), an epic that inspired Frank Miller to create the graphic novel *300*, a fictionalized version of the battle that was then adapted for a successful computer-enhanced feature film, released in 2007, that favored digital effects over historical accuracy. Alexander III of Macedonia (356-323 B.C.E.) has been the subject of two major films: *Alexander the Great* (1956), a U.S.-British coproduction, and the Oliver Stone epic *Alexander* (2004), which features several battles that flirt with historical facts. The Third Servile War (73-71 B.C.E.), waged by escaped slaves against Rome, is portrayed in Stanley Kubrick's *Spartacus* (1960). Having lost the lead role in *Ben-Hur* (1959) to Charlton Heston, *Spartacus* star Kirk Douglas created his own ancient epic, giving an intense performance amid a flood of historical inaccuracies, including the crucifixion of Spartacus, who supposedly died in battle.

Roman and Egyptian warfare during the reign of Cleopatra VII (69-30 B.C.E.) provides excitement in two films, both titled *Cleopatra*, that contain references to William Shakespeare's *Julius Caesar* (c. 1599-1600): a 1934 Cecil B. DeMille effort and a historically indefensible 1963 disaster featuring Octavian's victory over Marc Antony at Actium (31 B.C.E.). Producer Samuel Bronston and director Anthony Mann made *The Fall of the Roman Empire* (1964), a box-office bomb (set during 180-192 C.E.) rife with historical falsehoods, including the "Battle of the Four Armies" between renegade Roman legions and a force from Armenia and Persia (actually Parthia). Set during the same period, Ridley Scott's

Michael Ochs Archives/Getty Images

Actor Kirk Douglas as Spartacus in the 1960 film of the same name, depicting the gladiator who rebelled against Rome.

Gladiator (2000) opens with a Roman victory over an army of Germanic Barbarians. Responsible for reviving the "historical" epic (including Wolfgang Petersen's *Troy*, 2004, based on the works of the ancient epic poets Homer and Vergil), the film produced the "*Gladiator* effect," increasing public interest in classical subjects.

MEDIEVAL WORLD

Films depicting medieval warfare have frequently been popular with audiences, whose knowledge of "history" often is gained from what they see on the screen. Since the silent era, the legendary King Arthur has been featured in many war-oriented Anglo-American films. Bronston and Mann also made the romanticized *El Cid* (1961), starring Charlton Heston as the Castilian "master of military arts" who conquered Valencia with a combined Christian and Moorish army (1094-1102). The film vividly depicts an early form of psychological warfare—terrorizing the enemy before attacking suddenly—and the fictionalized ending, with the corpse of the Cid charging into battle, is unforgettable.

The Crusades (1095-1272) have been represented in epics about Robin Hood as well as in Cecil B. DeMille's *The Crusades* (1935) and Ridley Scott's *Kingdom of Heaven* (2005), which prove that "historical accuracy" in films set in the medieval world did not increase much over seven decades. The 1242 Battle of the Ice at Novgorod between Russian peasants and the Teutonic Knights of the Holy Roman Empire is energized by the montage of Sergei Eisenstein and the music of Sergei Prokofiev in the Soviet masterpiece *Alexander Nevsky* (1938).

The story of Joan of Arc has spanned the history of film, from wartime variations during World War I to French epics such as Carl Theodor Dreyer's *The Passion of Joan of Arc* (1928) and Luc Besson's *The Messenger: The Story of Joan of Arc* (1999), which focuses on the teenage Joan's military leadership during scenes featuring anachronistic weaponry. The English perspective during the Hundred Years' War (1337-1453) has been visualized in two adaptations of Shakespeare's *Henry V* (c. 1598-1599): Laurence Olivier's 1944 "wartime version" and a 1989 retooling by Kenneth Branagh featuring a brutal recreation of the Battle of Agincourt (1415).

For *Braveheart* (1995), the epic about William Wallace's role in the Wars of Scottish Independence, director and star Mel Gibson sought optimum historical realism for the battles of Stirling and Falkirk. Members of Clan Wallace appeared as extras, and armorer Simon Atherton provided accurate weaponry. Gibson used rapid editing and thunderous sound to depict the calamity of medieval warfare, creating scenes so shocking in their brutality that they prompted some patrons to flee theaters in 1995. Like most "historical" epics, *Braveheart* was criticized by traditionalist scholars for its revisionism (a tendency

less forgivable in the depiction of modern history but unavoidable in a visualization of the thirteenth century).

Modern World

The English Civil War of the 1640's provided a backdrop for the "historical horror" film *Witchfinder General* (1968) and the epic *Cromwell* (1970), featuring technically impressive though historically inaccurate depictions of the battles of Edgehill and Naseby. In 1939, Hollywood depicted British and Native American attacks in *Allegheny Uprising* (colonial period) and *Drums Along the Mohawk* (revolutionary period). The American Revolution took center stage in *1776* (1972) and *The Patriot* (2000), an ultraviolent and historically inaccurate portrayal in which Mel Gibson plays a variation on *Braveheart*, trading his medieval war hammer for a tomahawk.

In 1927, Abel Gance directed the French silent *Napoleon*, which was groundbreaking in its use of wide-screen battle sequences. France also produced a sound *Napoleon* (1955) that re-created the battles of Austerlitz and Waterloo. A film adaptation of Leo Tolstoy's *Voyna i mir* (1865-1869; *War and Peace*, 1886) was released in 1956 (an Italian-U.S. coproduction), and in 1963-1966 Soviet director Sergei Bondarchuk adapted the work into a four-part series that stands as the most expensive film ever made. In 2003, Russell Crowe starred in *Master and Commander: The Far Side of the World*, a historically detailed adaptation of three Patrick O'Brian novels about Napoleonic maritime warfare.

The Texas War of Independence (1835-1836) has been depicted in many films, including John Wayne's cinematically impressive, historically dubious *The Alamo* (1960) and a 2004 revisionist remake showing the viewpoints of both armies. The Crimean War (1853-1856) inspired Alfred, Lord Tennyson's "The Charge of the Light Brigade" (1854), a poem that has been adapted for two films, a 1936 Warner Bros. adventure starring Errol Flynn and a 1968 British remake. The Indian Rebellion of 1857 provided pro-British colonial warfare for the Hollywood adventure films *The Lives of a Bengal Lancer* (1936) and *Gunga Din* (1939).

The American Civil War was initially represented by Hollywood blockbusters based on pro-Confederate novels. The silent era was revolutionized technically by D. W. Griffith's *The Birth of a Nation* (1915), featuring political and racial stereotypes solidified decades later by David O. Selznick's nostalgic *Gone with the Wind* (1939), which includes some brief scenes of wartime devastation, such as its towering crane shot showing a sea of wounded Confederate soldiers on the streets of Atlanta.

John Huston's 1951 adaptation of Stephen Crane's 1895 novel *The Red Badge of Courage* includes some anachronistic weaponry, but its focus on a young soldier (World War II hero Audie Murphy) horrified by the reality of war was one of the first realistic portrayals of the conflict on film. The Civil War has energized countless Westerns, including Sergio Leone's "spaghetti" epic *The Good, the Bad, and the Ugly* (1966), with Clint Eastwood braving battles while searching for buried Confederate gold. *Glory* (1989), Edward Zwick's powerful, semifactual film about the African American Fifty-fourth Massachusetts Volunteer Infantry, has been praised for providing an antidote to the falsehoods of *Gone with the Wind*.

Western war films often feature (highly stylized) battles between whites and Native Americans. Raoul Walsh's fictionalized film about the life of George A. Custer, *They Died with Their Boots On* (1941), became a heroic vehicle for Errol Flynn, while John Ford depicted several battles in his "cavalry trilogy": *Fort Apache* (1948), *She Wore a Yellow Ribbon* (1949), and *Rio Grande* (1950).

Prior to the U.S. government's establishment of propaganda policy during World War I, feature films created support for the military. *The Brand of Cowardice* (1916) and *The Deserter* (1916) both depicted American men who became like treacherous "foreigners" when they refused to fight. After President Woodrow Wilson declared war in April, 1917, the Committee on Public Information exerted a control over fiction films that was more important than that directed toward the "documentaries" being produced. The most extensive federal involvement in Hollywood films came from the Department of Publicity for the Fourth Liberty Loan Drive. Criticized

for his pacifism, actor, writer, and director Charles Chaplin "did his part" by supporting the Third and Fourth Loans, then combined propaganda with comedy in *Shoulder Arms* (1918).

Hollywood's first World War I epic, *The Big Parade* (1925), opens in stereotypical fashion with men anxious for the "fun" of warfare but later features an Allied march through an empty forest that explodes with German machine-gun fire. Another scene captures the appalling stench of no-man's-land when James Apperson (played by John Gilbert) lands in a shell hole with the corpse of an enemy he has just killed. Aerial warfare was staged on a grand scale for William Wellman's *Wings* (1927) and Howard Hughes's *Hell's Angels* (1930), both featuring heroic flyboys in aerial sequences that were remarkably realistic for the period.

Perhaps the most memorable World War I film, Lewis Milestone's *All Quiet on the Western Front* (1930), based on Erich Maria Remarque's antiwar novel *Im Westen nichts Neues* (1929; English translation, 1929), was groundbreaking in its use of the German perspective. The film's horrific images of soldiers being ripped to pieces during combat is surpassed only by the final scene: Amid the mud and blood of the trenches, the protagonist, Paul Bäumer (played by Lew Ayres), is shot to death as he reaches out to grasp a butterfly.

Realizing that Depression filmgoers might be ill served by realistic images of the war's western front, Hollywood filmmakers produced paeans to the heroes of World War I who "made the world safe for democracy," including Warner Bros.' *Sergeant York* (1941). Previously, Warner Bros. had taken risks depicting the challenges faced by veterans, in *The Public Enemy* (1931) and *I Am a Fugitive from a Chain Gang* (1932).

John Ford's *The Lost Patrol* (1934) depicts British cavalrymen battling a deadly, unseen enemy in the sands of Mesopotamia (now Iraq). Aerial warfare energizes Edmund Goulding's *The Dawn Patrol* (1938), which—in the hands of Errol Flynn—reinforces cinematic clichés involving World War I fighter pilots: white scarves flowing in the wind, chivalrous behavior during dogfights, and fatalistic attitudes wrought by impending death. Warner Bros.' *The Fighting 69th* (1940) chronicles the service of the "Irish" Sixty-ninth Infantry. Amid combat footage involving "Wild Bill" Donovan and poet Joyce Kilmer, James Cagney plays the classic conscript without a cause who is despised by his comrades. After his recklessness leads to several deaths, he redeems himself by waging a mortar assault on the enemy.

Though films set during World War I were prevalent in the years before U.S. entry into World War II, they gave way in 1941 before making a comeback with *The Blue Max* (1966), a British film about German flyers on the western front; the Australian antiwar film *Gallipoli* (1981); and *Flyboys* (2006), a look at American flyers who joined France's Lafayette Escadrille during 1916-1917.

The 1917 Russian Revolution was praised by montage filmmakers Sergei Eisenstein and Vsevolod Pudovkin in *October: Ten Days That Shook the World* (1927) and *The End of St. Petersburg* (1927), respectively. Two years earlier, Eisenstein had directed *Battleship Potemkin* (1925), a depiction of a 1905 mutiny by sailors against their czarist officers. The combination of montage technique and political propaganda made this semifictional military epic one of the most influential films of all time.

During U.S. involvement in World War II, the conventions of the war-film genre were further established, and the influence of these wartime productions can still be seen in films made in the early twenty-first century. The idea for the preparedness comedy *Buck Privates* (1941) began when Lou Costello suggested that moviegoers would be captured by a "soldier picture" capitalizing on the Selective Service and Training Act signed by President Franklin D. Roosevelt in September, 1940. The success of the film led to two more pro-service pictures featuring the comedy team of Bud Abbott and Lou Costello—*In the Navy* and *Keep 'Em Flying*—released prior to the Japanese attack on Pearl Harbor.

Roosevelt's establishment of the Office of War Information in June, 1942, called for Hollywood propaganda, a mandate affecting every film genre. Eventually, even Tarzan, Sherlock Holmes, and the Invisible Man were battling the Axis Powers. By August, 1945, nearly every battleground figured into a script.

Universal Film Co., courtesy National Archives

A scene from the 1918 film The Kaiser, the Beast of Berlin, *which promulgated anti-German sentiment and American support for post-World War I antisedition laws.*

The European theater of operations is portrayed in *Commandos Strike at Dawn* (1942) and *The Story of G.I. Joe* (1945), and the Pacific theater is the focus of *Bataan* (1943) and *Destination Tokyo* (1943). Celluloid war heroes were invented for top stars who stayed home: Errol Flynn (*Desperate Journey*, 1942; *Northern Pursuit*, 1943; *Uncertain Glory*, 1944; *Objective: Burma!*, 1945), Humphrey Bogart (*Sahara*, 1943; *Action in the North Atlantic*, 1943; *Passage to Marseille*, 1944), and John Wayne (*Flying Tigers*, 1942; *The Fighting Seabees*, 1944; *They Were Expendable*, 1945; *Back to Bataan*, 1945).

World War II continued to dominate postwar cinema. *Battleground* (1949), William Wellman's depiction of the Battle of the Bulge, was followed by the fictional *Sands of Iwo Jima* (1950), starring Wayne, and *The Naked and the Dead* (1958), based on Norman Mailer's 1948 novel about his wartime experiences in the Pacific. Submarine warfare was revisited in *Run Silent, Run Deep* (1956), prisoners of war were featured in *Stalag 17* (1950) and *Von Ryan's Express* (1965), and D day was "re-created" on a massive scale in *The Longest Day* (1962), the producer of which, Darryl F. Zanuck, summing up

the pseudohistorical content of war films, admitted, "There is nothing duller on the screen than being accurate but not dramatic."

Both theaters of war are represented in the 1970 epics *Tora! Tora! Tora!*, a U.S.-Japanese coproduction about the attack on Pearl Harbor told from both perspectives, and *Patton*, a biography of the general whose military brilliance was undermined by his cavalier treatment of soldiers. D day also is depicted in *The Big Red One* (1980), which is based on director Samuel Fuller's service in the U.S. First Infantry. The German perspective is offered in Wolfgang Petersen's *Das Boot* (1981), an accurate view of U-boat warfare set primarily within the confines of a submarine.

The first twenty-four minutes of Steven Spielberg's *Saving Private Ryan* (1998) have been hailed as the most realistic combat scene in film history. This meticulous re-creation of the landings at Omaha Beach on D day features actual World War II landing craft and weaponry. Spielberg also coproduced the television miniseries *Band of Brothers* (2001), a look at "Easy Company," a parachute regiment attached to the 101st Airborne, based on the 1992 book of the same title by historian Stephen Ambrose and interviews with veterans.

The Korean War and the Cold War are represented in films made over four decades, including films that depict combat (*The Bridges at Toko-Ri*, 1954; *Pork Chop Hill*, 1959), espionage (*The Manchurian Candidate*, 1962), nuclear war (*The Day After*, 1983), and military training (*Top Gun*, 1986). John Wayne attempted to repeat his *Alamo* tribute for soldiers in Vietnam with *The Green Berets* (1968), a counter to the antiwar movement and supported by the presidential administration of Lyndon B. Johnson. Following the withdrawal of U.S. troops from Vietnam, filmmakers created a new, graphically violent subgenre of films depicting the Vietnam War, including *Apocalypse Now* (1979), Francis Ford Coppola's updating of Joseph Conrad's 1902 novel *Heart of Darkness*; *Platoon* (1986), a response to *The Green Berets* based on Oliver Stone's own experiences; and *Full Metal Jacket* (1987), Stanley Kubrick's tale of U.S. Marines at the Tet Offensive.

Hollywood continues to "chronicle" U.S. involvement in foreign conflicts, increasingly focusing on how warfare psychologically affects soldiers. The Persian Gulf War of 1990-1991 is addressed in *Courage Under Fire* (1996), *Three Kings* (1999), and *Jarhead* (2005), while the Iraq War begun in 2003 and the "War on Terror" are explored in *Home of the Brave* (2006), *In the Valley of Elah* (2007), and *Body of Lies* (2008).

In 1965, Frank Sinatra directed the first U.S.-Japanese film coproduction, *None but the Brave*, a war film depicting the viewpoints of combatants on both sides. Four decades later, Clint Eastwood expanded on this idea by directing two innovative companion films, both of which were released in 2006: *Flags of Our Fathers*, the fact-based story of the troops who raised the U.S. flag on Mount Suribachi; and *Letters from Iwo Jima*, based on two nonfiction books, one by General Tadamichi Kuribayashi, who commanded the Japanese garrison during the battle. *Flags of Our Fathers* incorporates vivid battle flashbacks while focusing on the fates of seven U.S. Marines and their Navy corpsman, while *Letters from Iwo Jima* portrays the battle from the perspective of Kuribayashi and his men. Both films were critically acclaimed for their realism and evenhanded historical accounts, with *Letters from Iwo Jima* receiving the lion's share of praise for its empathetic view of the Japanese soldiers.

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Scott Allen Nollen

Ideology and War

Overview

War has been a universal and almost continuous human phenomenon from the earliest days of human life. The conduct of war until the modern era was mostly a matter for kings, emperors, chiefs, and their warriors. However, in the modern era, the Industrial Revolution, the Enlightenment, and the French Revolution (1789-1793) produced profound changes in the mobilization of populations in a political system for war. Ideas were coalesced into ideologies, which began to be used to motivate people to participate in all manner of causes. Such ideological causes seek to make great changes in the world that would be, according to some intellectual element in the ideology, "just" or "equal" or "national"—or whatever term was needed to mobilize the emotions of the masses.

Significance

Ideology is a belief structure that forms the minds of "true believers," or ideologues. Ideology so molds their thoughts that it becomes their worldview. It also binds them with similar ideologues and organizes their emotions for action. However, since a questioning attitude about their ideology is often not a part of their thought, their views are often rigid, self-righteous, and closed. The modern world has seen many ideologies that have provided the motives for war or other acts of violence.

History of Ideology and Warfare

Ancient World

The explicit study of ideologies began with the Enlightenment. However, many scholars across diverse fields believe that ideologies have always existed. Historically most governments in the world until the American Revolution were kingdoms, empires, or tribal chiefdoms. Kings and emperors usually relied on warrior castes to staff their armies. These arrangements used an ideology based on a social class system to perpetuate people's continual buying into the system. Often, these ideologies build themselves upon religious beliefs or official church teachings in order to justify their existence. One major exception occurred in the ancient Greek democracies. The citizen armies of a Greek *polis* (city-state) involved the whole male population, who accepted the ideology of the supremacy of their city-state, and they were expected to fight in its wars.

Some see religions or the justifications of autocrats, whether kings or some other kind, as ideologies. For example the Ali'i religious system of the Hawaiians functioned as an ideology. It justified the rule of the chiefs, *kahunas* (priests), and the *kapu* (taboo) system. Another example is the Seleucid Empire's use of Hellenism, which functioned as an ideology. It justified using violence against the Jews in support of their political vision (ideology) of a Hellenistic kingdom.

Medieval World

The fastest-growing religion of the medieval age, Islam, in many ways functioned as an ideology that led followers to engage in warfare to support its expansion throughout the Arab world, and even into parts of Europe. The religion, founded by Muḥammad in the early seventh century, provided a framework for many parts of its followers' lives, from social relationships to the proper conduct and aims of warfare. The Qurʾān gives instruction on, among many other things, the use of jihad (struggle) as a means of expanding the new religion. After Muḥammad's death in 632, warriors inspired by Islamic ideology wrested control of not only Muḥammad's in the Arab Peninsula but also the Levant, Asia Minor, North Africa, and the Iberian Peninsula. In Europe, Charlemagne's

capitulary (law or act) of 802 offered an ideological justification of the Holy Roman Empire, including both Popes and temporal rulers. The Crusades also relied on an ideology of warfare in order to justify the conquest of the Holy Land. The ideology put forth by Pope Urban II in 1095 in a sermon that inaugurated the First Crusade emphasized the injustice of Islamic control of Jerusalem and, in a broader sense, provided an ideological rationale for violence through its portrayal of enemies of Christendom and its assertion of divine rewards for those who pursued violence in the name of Christ. This justification of warfare in the name of a religious ideology had a permanent effect on Christianity, and the impact of the Crusades can be seen today in the theological justifications for certain types of warfare.

Modern World

Although ideologies have been present in human history ever since societies first took shape, their explicit articulation truly began in the revolutions of the late eighteenth century. Both the American and French revolutions produced statements that could be said to have formed an ideology for their movements. Both of these ideologies proved to be persuasive enough to convince people to voluntarily risk, and even lose, their lives in their defense. Specifically, the American and French revolutions share a rejection of monarchy and, by extension, autocracy as a form of government. Taking the place of autocracy was modernism, that is, political ordering that uses human political engineering to create a political system. The effect is to transfer loyalty from the person of the autocrat (usually a king) to the nation and/or a national ideology. The success of these revolutions brought about, for the first time, the study of ideologies.

The first use of the term "ideology" was by Antoine-Louis-Claude Destutt de Tracy (1754-1836) in his *Traité de la volonté* (1815, in *Éléments d'idéologie IV et V*; *A Treatise on Political Economy*, 1817). His ideas were rejected as impractical by Napoleon Bonaparte but were translated into English by Thomas Jefferson. In 1845, Karl Marx (1818-1883) and Friedrich Engels (1820-1895) wrote *Die deutsche Ideologie* (1845-1846; *The German Ideology*, 1938), in which they disagreed with Destutt de Tracy, who had defined "ideology" as the "science of ideas." Instead, Marx and Engels saw ideology as a fabrication by some group (ruling or commercial or other) to justify themselves. Disagreement over the very definition of ideology has grown ever since. For social scientists and especially political scientists, there is no single agreed-upon definition of ideology. There are, however, features of ideologies that are identifiable, and there are also clearly identifiable macro- and micro-ideologies.

Modern, explicitly stated ideologies are often political, materialistic, action-oriented, simple-minded, and mass-oriented. Politically, ideologies use selected sets of political ideas. They use ideas in ways that are simplistic, limited, and closed because they are seeking to move the hearts and minds of the masses to undertake action. In contrast to political philosophies, which teach understanding, ideologies incite to action.

The materialistic aspect of many ideologies arises from their vision of the present and near future. Ideologies often offer followers a hope for material improvements in life that are seen as attainable within a lifetime. Such ideologies promise that political evils will be overcome and replaced with a brave new world of peace and plenty. Ideologies also give solidarity to their followers. Political parties and movements come to a common identity from the ideas they hold, which creates an "ism." Nazism, communism, socialism, fascism, and other political philosophies that define factions or parties are known by their political idea sets. Nationalism seeks to enlist all the people of a political system into its fold.

Ideologies are also action-oriented because they seek to mobilize people into joining the "cause." There is some evil to be ended (global warming, saving the environment, ending poverty, or any number of others), which requires actions that are in line with the specific steps that must be followed to attain the goal. This leads to the creation of organizations that may be political, cultural, civic, economic, social, or even religious in order to put into action steps to reach the common purpose.

The simplistic nature of ideologies is found in the way in which ideas are combined that may or may not

be fully coherent. Intellectual rigor is not required for true believers who follow ideologies. As a consequence, symbol manipulation (which is very close to propaganda) enables the leaders of ideology-driven parties to gain support for vague or undetermined goals.

Mass mobilization to achieve the goals of the ideology is the final feature of ideologies. Quite often the mobilization is pitched in terms of war. The ideology uses affective language (language that appeals to emotions) to invite people to join the struggle, the battle, the crusade, the jihad, or even the war. The propagandists of ideologies use simple ideas with significant emotional appeal to mobilize the masses. This joining of people allows opportunities for personal expression to arise.

Revolutionary ideologies in the modern world have created a variety of wars. This is especially the case for the ideologies of liberalism and socialism. The nineteenth century wars of liberation in Mexico and South America were driven by varieties of liberalism that battled against autocratic rule. A number of the revolutions in Europe in the nineteenth century, especially those of 1848, were also revolutionary, their violence aimed at ending ancient forms of rule.

Nationalism—one of the most potent ideologies of the modern world—has been the source of numerous conflicts. In the late eighteenth and nineteenth centuries, as various groups of people in Europe abandoned autocratic forms of government that had ruled for centuries, the mobilization of the masses into nations led—in the case of the French—to a bloody Reign of Terror, then to wars to maintain the Republic, and then to wars to spread the ideology of the revolution, all in the name of the ideology of "liberty, equality, and fraternity." The ideology was a combination of both nationalism and universalism. The revolutionaries and their Napoleonic successor saw themselves as bearers of a universal gift of freedom for all people. The conservative counterrevolution was ultimately successful, instituting a peace designed by the prevailing autocratic powers.

During the Napoleonic Wars (1793-1815), Johann Gottlieb Fichte (1762-1814) delivered his *Reden an die deutsche Nation* (1808; *Addresses to the German Nation*, 1922) becoming the father of German nationalism. He also propounded the idea of the closed economic state in *Der geschlossene Handelsstadt* (1800; the closed commercial state), presenting a theory of economic autarchy, or isolationism. If each nation developed its own economy in isolation, reasoned Fichte, the absence of economic conflicts would bring peace. The vision of isolationism as an application of nationalism was ideological but ultimately ineffective in preventing war.

Nationalism in the nineteenth and especially the twentieth century has been the cause of war. Both the Nazis and the Fascists used it to justify imperialism as territorial expansion. German chancellor Adolf Hitler asserted the Germans' need for *Lebensraum* ("living room," or room to expand the nation), which justified removal of inferior nations (Slavs, Gypsies, Jews, and others). The idea had been proposed in 1897 by Friedrich Ratzel and developed by others before Hitler's rise to power. The racism of the Nazi ideology was used to wage war against "inferior" people.

For Italian dictator Benito Mussolini, expansion was a nationalist goal that would restore Italy to its ancient, glorious past. A new Roman Empire was to be created that would allow for the cultural superiority of Italians, as inheritors of the Romans, to be expressed. The conquest of Ethiopia by the Italian Fascists was an action for spreading Italian nationalism.

The key element that Nazi and Fascist ideologies inherited from their autocratic predecessors was militarism. The glorification of war was hailed as something necessary for the preservation of the state. War was not just a pragmatic instrument of policy but an end in itself. The rise of Nazi and Fascist dictators was due in part to their successful mobilization of the population through militarism. The state would not accept defeat, and scapegoats (Jews, for example) were offered to explain national difficulties. Military aggression appealed to a population suffering from the worldwide depression, offering a promise of victories to come that would change the present and usher in a glorious future.

Democratic governments have also been nationalistic and have engaged in wars of expansion. The

United States' wars with Great Britain (the War of 1812), Mexico (1846-1848), and Spain (1898), as well as its Indian Wars and the Philippine-American War (1899-1902), were conducted as nationalistic campaigns, often with a dose of racism. Other countries have also engaged in nationalistic conflicts; the several wars between India and Pakistan, for example, have had nationalistic ideologies at their base.

While there have been wars justified by religion, the Arab-Israeli wars have been spurred by many factors, including religion (Judaism versus Islam), territorialism (Israel versus Palestine), ethnic rivalries (Jews versus Arabs), and nationalism (Zionism vs. Palestinian Nationalism). The rise of Islamic Jihadists—who are advocates of an ideological version of Islam (Salafism), whether of the Wahhābī type or the Iranian (Hezbollah)—has produced a religious ideology that, in the case of the Wahhābī Ikhwan movement, inspired many to fight battles for King ibn Saud. Modern Salafism, espoused by Osama Bin Laden and others, advocates the use of terrorism in order to achieve its goal of global conquest for Islam as well as a reactionary return to what it holds to be the purity of Islam during the age of Moḥammad and his companions.

A Nazi poster touts the benefits of euthansia: It says, "This is what this person suffering from hereditary defects costs the Community of Germans during his lifetime. Fellow Citizen, that is your money, too." The banner's largest message touts a future "New People" (neues Volk).

In the twentieth century, the post-World War II decades of decolonization have been interpreted as nationalistic wars. The Mau Mau movement in Kenya (1952-1957) and other anticolonial uprisings were nationalistic. During the Cold War, the ideological struggle between Soviet and Chinese communism and the democracies of the West usually played out in areas of the Third World such as Africa, South Asia, and Latin America, where nationalistic groups, whether communist or democratic in their orientation, engaged in proxy wars for their ideological champions.

The communist regimes practiced the revolutionary variety of socialism. The use of violence, both by the ancien régime against revolutionary collaborators and by the revolutionaries to eliminate members of the old order, caused the deaths of millions. The communists waged "class warfare" against their opponents—the wealthy classes, aristocrats, and religious. In the case of the Chinese communists the poor peasants were mobilized to support the liquidation of the Chinese property owners, who were often peasants themselves who happened to own their farms.

Among the collaborators killed by Joseph Stalin (1878-1953), who succeeded Vladimir Ilyich Lenin (1870-1924), were anarchists and other libertarians. While advocates of the use of violence, most were not organized to wage war because they adhered to the theory of Karl Marx that capitalism caused wars and that with the end of capitalism there would be an end to the state and to wars. The state itself was the cause of wars for anarchists.

The list of ideologies ranges widely, from economic ideologies of capitalism and socialism, to political ideologies such as communism, fascism, and liberalism, to other types of ideologies such as racism, environmentalism, pacifism, and many more. While all are ideologies and share ideological characteristics, they also can, under the right conditions, condone violence in some form or other to gain the political changes they seek.

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Andrew J. Waskey

Literature and Warfare

Overview

War is life's greatest conflict and the ultimate form of competition. As such, it continues to provide writers with a fertile field for examining the always intriguing complexities of human nature. Warfare is often railed against, and on occasion it has been chic to view it as obsolete. In the overall scheme of things, however, war has generally managed to remain popular. Indeed, the noted philosophers Will and Ariel Durant once calculated that in the past 3,000 years only 268 of those years have been free of war. With this in mind, it is perhaps not surprising that wars have provided grist for some of the world's most enduring literature.

Significance

Literature that focuses on war recognizes how war affects human behavior through characters created in literature.

History of Literature and Warfare

Ancient World

Organized armies have fought against each other for at least ten thousand years. Either at war or in anticipation of war, military infrastructures have played a key role in the organization of human societies. The earliest civilizations of China, for example, were established by organized armies.

Accounts of the earliest conflicts were preserved in song and story through oral tradition, often setting warfare in a mythological context. Rigvedic hymns of ancient India, for instance, relate tales of the warrior god Indra. A Babylonian epic poem, "War of the Gods," deals with the myth of world creation and the establishment of divine hierarchy, which formed part of a New Year's festival.

The earliest literary work in the Western tradition to deal with war is found in the *Iliad* (c. 750 B.C.E.; English translation, 1611), ostensibly written by Homer (c. 750 B.C.E.), but whether or not it is a work of shared authorship is a moot point. One of the classics of world literature, the *Iliad* deals with the very long and savage war between Athens and Sparta—the Trojan War (c. 1200-1100 B.C.E.)—with the culminating siege of Troy, which dragged on for three decades. The war was originally based on a struggle for control of important trade routes across the Hellespont. However, in the *Iliad*, the story centers on one incident: the Trojans' attempt to recover the abducted Helen of Troy. When Agamemnon—king of the Greeks (who invade Troy), refuses to ransom Chryseis to her father, the god Apollo inflicts a plague of pestilence on them, compelling Agamemnon to return the girl. Not to be entirely thwarted, Agamemnon takes Achilles' prized concubine instead. Dishonored, Achilles withdraws his warriors. War here is depicted as not only mean and bloody but also a process of retaliation and quid pro quo. During this process, when a warrior is slain or an attack is perpetrated, the fury of the combatants escalates. Such endlessly escalating conflict required a resolution, and Homer offered one in the *Odyssey* (c. 725 B.C.E.; English translation, 1614), which tells the story of a survivor of the Trojan War, Odysseus (or Ulysses), who undergoes a series of adventures that function as tests and atonements before he can return home to a joyful reunion with his wife, Penelope. Both the *Iliad* and the *Odyssey* draw heavily on the rich storehouse of Greek mythology, and in so doing provide a "divine" perspective on the issues of loss and redemption surrounding the Greek view of war.

In the *Aeneid* (29-19 B.C.E.; English translation, 1553), war is the context for nation-building: The Roman poet Vergil (Publius Vergilius Maro) uses literature as a sort of genealogical tool to reconstruct the beginnings of the Roman Empire. In this epic poem, the Greek warrior Aeneas has fled his native

land following the Trojan War and—after a series of adventures, some harrowing—arrives in Italy, where he proceeds to recount the details of the Trojan War. After defeating the Rutulian leader Turnus in battle and miraculously recovering from a wound received in combat, Aeneas marries Lavinia (daughter of Latinus, king of the Latins) and establishes the new kingdom on the Seven Hills that has been promised to him in a dream.

MEDIEVAL WORLD

The adopted nephew of Charlemagne, the knight Roland, and his bosom friend Oliver, together with their valiant comrades, sacrifice their lives to protect Charlemagne's army by defending the pass at Roncesvalles in the Pyrenees Mountains in 778 C.E. Their epic defense was later immortalized in the anonymous *Chanson de Roland* (c. 1100; *The Song of Roland*).

Among Germanic peoples, one of the most influential works of literature was the *Nibelungenlied* (c. 1200; English verse translation, 1848; prose translation, 1877), set in the fifth century in north-central Europe. Although medieval in origins, the *Nibelungenlied*, like the Homeric writings, draws on numerous myths, including Siegfried's titanic battle with a great dragon, including rituals of ancient worship that are woven throughout the work. War, again, is depicted in the context of national origins and identity, with an emphasis not on realism but on the mythic and glorified aspects of battle, reflecting an ancient Germanic cult of hero worship.

By the late Middle Ages and early Renaissance, the literature of war had begun to depart from the reliance on mythology found in earlier literature and to concern itself more with historical reality. The topic of war continues to provide an opportunity for writers to speak of glory, honor, and courage, but with increasing fidelity to the background against which the story is set. William Shakespeare's *Henry* plays, for example—*Henry IV, Part I* (1592), *Henry IV, Part II* (1597) and *Henry V* (c. 1598-1599)—smoothly blend poetry and history both to glorify England and to explain how the notoriously un-princely Henry V evolved from a rakish and somewhat unprincipled youth into a revered king, the hero of Agincourt. In the belief that he has as much lawful right to the throne of France as did Charles, the reigning French monarch, Henry V makes his claim for that crown. Insulted by Charles's son, the Dauphin, Henry prepares for war. At the decisive Battle of Agincourt, Henry's leadership carries the day, despite the fact that his army is outnumbered and weakened by illness. Shakespeare glorifies Henry V (r. 1413-1422) and his victory at Agincourt, and his contemporaries may well have regarded the portrayal as an overtly patriotic affirmation of contemporary warfare against Spain. However, many critics have seen in the play's language and portrayals a more ambiguous attitude toward warfare and perhaps a veiled criticism of contemporary events in Elizabethan England (where open criticism of the monarchy and its policies would not have been safe). The play thus illustrates both the growth in literature referencing actual events and the sensitivities, and potential dangers, of doing so.

MODERN WORLD

As world civilizations advanced in age and (especially) technology, these achievements were reflected in world conflicts. Wars increasingly expanded their sphere of impact. Increasingly, battles were no longer confined to unpopulated areas. Accordingly, literature sought to keep pace with the evolution of modern warfare. Although the heroic values present in the literature of ancient and medieval wars was still to be found in literature the realism, the suffering and horror of war became increasingly evident.

As warfare evolved into the so-called modern period, writers sought to present their subjects more realistically. Literary characters provided the opportunity and the voice to reveal a more accurate portrayal of the grim horrors found on the battlefield. In literature as in real life, war as a glorious confrontation of chivalric honor was now depicted as a bloody crucible of suffering and death.

Novels, plays, and poems increasingly began to address not only the external events of war but also the soldier's personal experience of such traumatic events, from courage to cowardice. In Stephen Crane's classic Civil War novel, *The Red Badge of Courage: An Episode of the American Civil War*

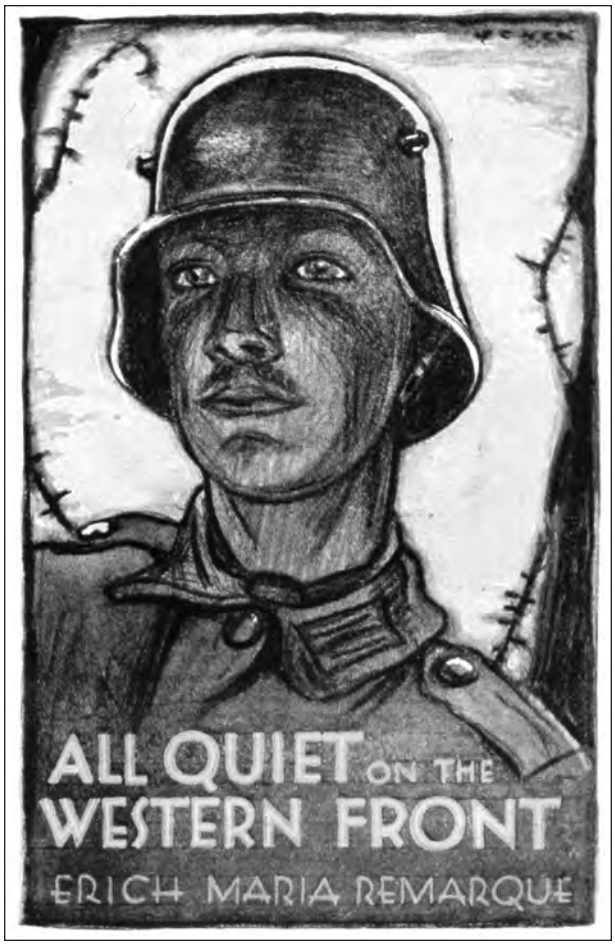
(1895), young Henry Fleming finds himself tormented by fear. Having dreamed of glorious battles as a young farm lad, he was at first anxious to taste combat, as are many soldiers who find themselves on the field of war for the first time. Now, as his regiment advances, Henry sees battle as an escape from the boredom of inactivity. Then comes battle, with its cacophony of sounds, followed by an enemy counterattack and panic. Henry flees from the field and now thinks of himself as a coward. In a subsequent battle, he redeems himself, earning the praise of his lieutenant. The novel offers the reader an instructive psychological profile of one young man enduring the chaos, fear, and self-doubt that every soldier must face.

In his 1929 novel of World War I, *Im Westen nichts Neues* (1929; *All Quiet on the Western Front*, 1929), Erich Maria Remarque produced what is generally thought to be the best-known work of antiwar literature published between the two world wars. The novel was subsequently adapted for the screen, starring actor Lew Ayres. So forcefully did the film depict the horror of war that Ayres became a pacifist and later refused to serve in the military during World War II.

Two other haunting and memorable literary statements to emerge from World War I are Lieutenant Colonel John McCrae's poem "In Flanders Fields" (1915) and the poem "Rouge Bouquet" (1918), by Sergeant Joyce Kilmer (perhaps best known for his poem "Trees," 1914). In "Rouge Bouquet," Kilmer memorialized his World War I comrades, who had perished at Rouge Bouquet, near Baccarat in France. Many other poets emerged from this war, including the "war poets" Wilson Owen, who died in battle at the age of twenty-five, and his friend Siegfried Sassoon.

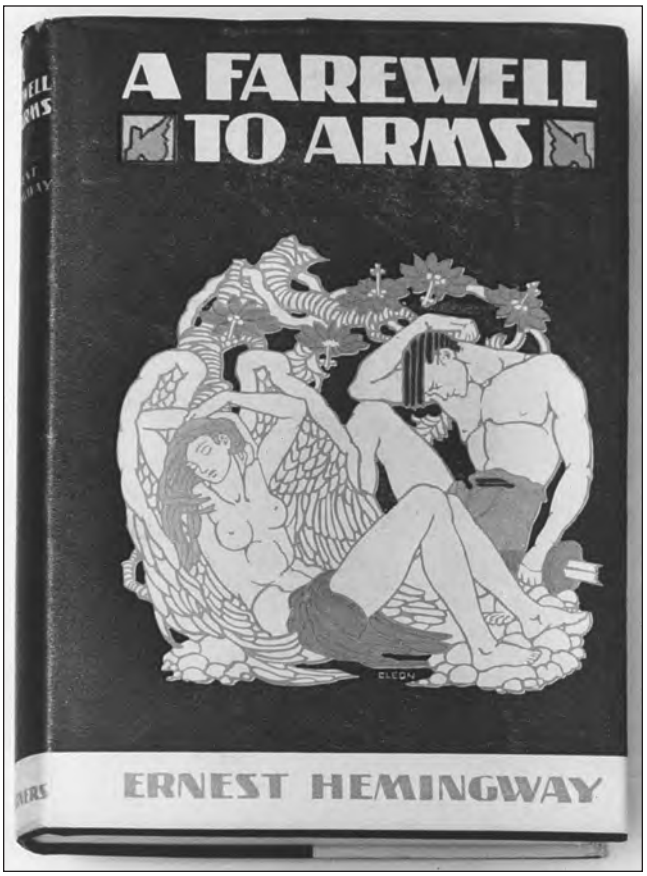
World War I and its fierce trench warfare gave rise to what a group of writers called "the lost generation"; they not only depicted the horror of war but also questioned its value and necessity as a means of resolving disputes between nations. In his novel *A Farewell to Arms* (1929), Ernest Hemingway wrote what many regard as the strongest polemic against war. The story is told through the eyes of a young American officer, Lieutenant Frederic Henry, who is attached to a medical unit on the Italian front. There he meets and falls in love with a nurse, Catherine Barkley. Wounded, Henry is hospitalized and eventually has surgery on his knee. He and Catherine are together during his rehabilitation. She becomes pregnant. While attempting to avoid capture by the Germans, Henry deserts, and the two manage to reach Switzerland, where Catherine and the baby both subsequently die.

One of the most meaningful works of modern literature to address the subject of war, Norman Mailer's *The Naked and the Dead* (1948), is regarded by some as the best novel of World War II. The author set his story on a South Pacific island, focusing primarily on one platoon of soldiers: their trials and tribulations, their interactions with one another, and



The Granger Collection, New York

The original 1929 front jacket cover for Erich Maria Remarque's All Quiet on the Western Front.



Time & Life Pictures/Getty Images

Ernest Hemingway's A Farewell to Arms.

the same fears and issues with which young Henry Fleming grapples in *The Red Badge of Courage*. In the world of *The Naked and the Dead*, there is little empathy among the members of the platoon, and no sympathy whatever for their Japanese foes. Mailer introduces a second element to his novel, wherein he uses his story as a forum to describe ridiculous army rules and protocols, always the source of irritation for the soldiers. The novel also sets the conflict in perspective by providing background for the campaign and a critique of military judgment.

Satire and comedy have been used in many modern works to depict and condemn war. Critique of war becomes an outright condemnation in Joseph Heller's *Catch-22* (1961), which uses satire to focus on the futility and sheer idiocy of the way in which the military prosecuted war. Heller's main character, Yossarian, a bomber pilot based in Italy, has looked at enough sky. He has no interest in heroism, medals, or glory. His one abiding interest is to get rotated home. In what almost appears to be a contrived setup, Yossarian finds that each time he approaches the required number of missions to qualify for rotation home, the higher echelon increases the number. Determined, Yossarian resorts to various deceptions to try to defeat the system. Heller provides a supporting cast of characters every bit as devious as Yossarian. Hilarious in its satiric effect, *Catch-22* speaks against war as loudly as more serious works—but here by casting war as a farce.

The novel *Mister Roberts* (1946), by Thomas Heggen (adapted for the stage in 1948 by Heggen and Joshua Logan, and in 1955 released as a feature film), focuses on life as a soldier, making the audience aware that men in combat must deal not only with fear and suffering but also with the boredom of daily life in the backwater of war. The setting is a supply ship in the South Pacific commanded by a tyrannical captain who cares only about his next promotion. The hero, Lieutenant Douglas Roberts, who longs for a transfer to combat, finally gets his request for transfer approved by the captain—or rather by the members of the crew, who forge the captain's signature in repayment for Roberts's having managed to secure liberty for the crew by agreeing to give up challenging the captain's authority.

The Vietnam War (1961-1975) has occasioned many novels. In these works, realism has continued to be emphasized—including, again, the psychological experiences of the individual soldier. In the case of Tim O'Brien, a Vietnam War veteran, psychological realism renders his novels extremely personal to the point where, at times, the narrative crosses the boundary between actual fact and internal imaginings. *Going After Cacciato* (1978, revised 1989), which won a 1979 National Book Award, examines the conflicting moral imperatives of the Vietnam War when the point-of-view character, Paul Berlin, joins others in his platoon to retrieve the deserter Cacciato (literally "the hunted" in Italian), who has vowed to escape the war by walking to Paris. The ac-

tual events in the narrative are seamlessly interrupted by Berlin's fantasies and fears, making the distinction between reality and Berlin's psychological state difficult to discern. The clear sense, however, is that Cacciato, in attempting to carry out his insanely bold plan, is a hero—in some ways a goal to be pursued rather than a criminal to be hunted—as the soldiers grapple with the moral ambiguities of following orders not because they believe in the war but because they need to avoid the fate that Cacciato will inevitably meet when they finally locate him near the Laotian border.

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Jerry Keenan

Music and Warfare

Overview

Music, a prime means of expressing the human experience, has been closely connected to warfare from earliest times. Within military establishments, music fosters team spirit, conveys signals, and provides the cadence for coordinated marching. Music also plays a vital liturgical role, invoking God's help in battle and celebrating victory. Less formally, most cultures have created a large genre of "soldiers' music" sung by fighting men and women. A large body of civilian music also reflects on war, ranging from simple tunes about soldiers seen on the street to magnificent orchestral works that conjure up a purified battlefield experience. The nineteenth and especially the twentieth century also saw the rise of antiwar music at both the popular and the concert-hall levels.

Significance

The scholarly trend of studying "war and society" rather than narrow battlefield history has encouraged investigation of the intersection between music and warfare. Music offers a practically unmined wealth of sources that reveal what society at large has thought of the experience of war—and what the soldiers felt about the matter. Study of music and warfare is, however, still in its infancy. There are major studies of the music of the U.S. Civil War (1861-1865), the two world wars (1914-1918, 1939-1945), and the Vietnam War (1961-1975), but the war music of earlier eras has scarcely been touched.

History of Music and Warfare

Ancient World

The biblical book of Joshua makes it plain that, in the late second millennium B.C.E., the Israelite army was accompanied by trumpeters: "seven priests shall bear before the ark seven trumpets of rams' horns. . . ." (Joshua 6:3). From the context, their purpose seems both religious and military: The trumpets signaled the army, whose great shout brought down the walls of Jericho. Indeed, the first evidence of music in warfare is distinctly religious, as in Numbers 10:9, when the Israelites are instructed to blow trumpets before setting out to war to summon God's help.

It is likely that Egyptian and Mesopotamian armies also used "trumpets" (bored animal horns) for military signals. That other early civilizations also used musical instruments for signals is suggested by the terra-cotta army of China's first emperor, Qin Shihuangdi (died 210 B.C.E.), which includes chariots equipped with large kettledrums.

The ancient Greeks developed a new use for military music: creating a cadence for coordinated action. Hoplite warfare consisted of men marching in very tight ranks carrying spears—they needed to march, not just stroll at their own rates. A fifth century Greek painted vase depicts hoplites marching into battle stepping to the tune of an *aulos* (double flute), which must have been common. The aulos is also attested on warships, setting the beat for rowers. It is very likely that Greek soldiers sang, although the lack of professional standing armies before the fourth century B.C.E. makes it less probable that there was a distinct genre of "soldiers' songs."

Songs about war, most notably Homer's eighth century epic the *Iliad* (c. 750 B.C.E.; English translation, 1611), were, however, enshrined at the heart of Greek culture throughout the classical period and beyond. Schoolboys studied the *Iliad* as poetry, but most people would have experienced it chanted by wandering performers who accompanied themselves on the harp. Oddly, the first extensive song about war is also the first extant condemnation of warfare, as Homer explored the human cost and senseless waste of the Trojan War (c. 1200-1100 B.C.E.).

Evidence becomes better in the Roman period. It

is known that Romans used large metal horns (*tubae*) and kettledrums to convey signals; the contemporary Celts also employed bronze horns. To judge from extant carvings, Roman soldiers at least sometimes also marched to the cadence of horns. Music was employed in the rituals of war, including as accompaniment for the dancing priests of the war god Mars. Rome's chief novelty, though, was clearly attested in soldiers' songs. Rome's professional soldiers sang around the campfire, and traces of their songs have survived. Most notably, the Roman historian Suetonius quotes several songs that soldiers sang during triumphal marches as they processed through Rome. Particularly noteworthy is a ditty produced for Julius Caesar's triumph that might be translated as "See the Bald Adulterer Come," sung by the soldiers in mocking honor of their general.

Medieval World

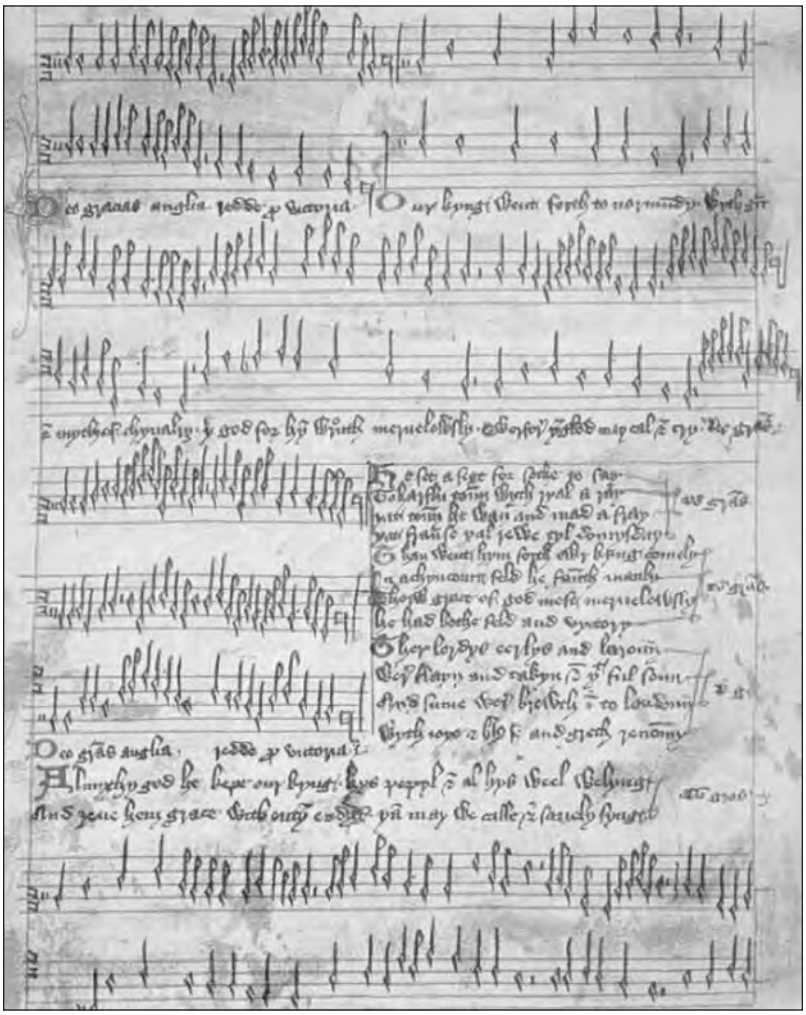
The evidence for the intersection of music and warfare gradually improves during the course of the Middle Ages. The idea of armies marching in step was lost to Europe with the fall of the Western Roman Empire, but other forms of war music continued in the Germanic successor states. Especially noteworthy was a substantial body of German-language epic poetry, originally sung, most of which is now lost to us. The oldest literary work in German, the *Lay of Hildebrand* (c. 800 C.E.), which has survived only as a fragment, tells of the beginning of a battle between the hero Hildebrand and his son. Such a tradition is also preserved in the Anglo-Saxon epic *Beowulf* (first transcribed c. 1000), which dates to the same period. Although the hero Beowulf fought monsters, epics also told of battles against human enemies, such as the *Battle of Maldon* (c. tenth century), which commemorates an unsuccessful attempt to repel Viking invaders from England in 991. Far from celebrating war, the tales of Hildebrand, Beowulf, and Byrhtnoth (the English commander at Maldon) all end in tragedy. The songs tell of loyalty in battle but also of the failure of that loyalty and the death of heroes. Later epics, such as the Old French *Chanson de Roland* (c. 1100; *The Song of Roland*), were also performed, as can be seen from notations on the early manuscripts. *The Song of Roland*, commemorating (and magnifying) a defeat Charlemagne's rear guard suffered in Spain, glorifies warfare rather more than the earlier Germanic epics, but the poem still ends in death and betrayal. Clearly the age of chivalry involved more than just a senseless glorification of war.

The European Middle Ages also shed more light on liturgical music before and after military endeavors. Most notable is the *Te Deum*, a plainchant of thanksgiving to God. While war is not mentioned in the text (which begins: "We praise you, God, we acknowledge you to be the Lord"), it was the custom by the High Middle Ages to hold public religious ceremonies after great military victories, in which the *Te Deum* played a central part. We can also see warriors, most notably Crusaders after 1095, singing hymns while invoking God in processions; unfortunately, few of the lyrics and none of the music in this genre have survived.

A system of music notation was created in the eleventh century, making it possible to imagine what Europe's warlike songs sounded like, although at first few secular tunes were written down. Some of the earliest were propaganda pieces for the Crusades. One of the most haunting was a famous song by the troubadour Marcabru (died 1150) that begins "Pax in nomine Domini" (peace in God's name) and encourages crusading in Spain. The music, with a rising cadence as Marcabru describes how men can have their souls cleansed by fighting for Christ, conveys both excitement and longing.

The short medieval songs that have survived tend to be positive. A notable example is the Agincourt carol, written shortly after England's victory over France on October 25, 1415. It begins:

> Our king went forth to Normandy
> With grace and might of chivalry
> There God for him wrought marvelously
> Wherefore England may call and cry
> Deo gratias [thanks be to God].

The Agincourt carol was widely popular in England and probably facilitated recruitment for King Henry V's ongoing war in France. Not all songs about war and fighting men were positive, however. One of the

A facsimile of the Agincourt carol in the Bodleian Library, Oxford.

most popular songs of the fifteenth century was the French "L'Homme armé" (the armed man). Its text runs:

> The man, the man, the armed man,
> The armed man
> The armed man should be feared, should be feared.

The composer indulged in considerable word painting, raising the pitch as he told of a proclamation that all should be armed and clothing the whole song in an awkward rhythm that hints at how unsettling the presence of soldiers could be.

The greatest innovation in war music of the medieval era, however, came from the Ottoman Turkish Empire, which by the thirteenth century had begun to employ military marching bands. The instruments chosen were loud and abrasive, audible over the noise of men and horses on the move. In its classic configuration, the Turkish band consisted mostly of percussion—bass drum, kettledrum, frame drum, cymbals, and bells—with only harsh trumpets to provide melodies. Such instruments could convey signals, but their most important task was to promote unit cohesion, notably among the elite janissary units, the sultan's famous slave soldiers. Marching in time, at first to foster esprit de corps, became essential as the Turks introduced first the pike and then the musket into their infantry. These long and unwieldy weapons were effective only when the ranks were packed tightly together, so careful drill and coordination were essential to avoid chaos.

MODERN WORLD

Music for drill and marching reentered European armies in the seventeenth century, most closely identified with the military reforms of Gustavus II Adolphus of Sweden (r. 1611-1632). His pike and musket drill gave birth to the drummer boy, a figure familiar on western battlefields for centuries. The military marching band became increasingly complex and formal, until by the eighteenth century most army bands included woodwinds and brass instruments as well as percussion (the first Marquess Cornwallis's band played "The World Turned Upside Down" when he surrendered to the American revolutionaries at Yorktown in 1781). Such bands provided both popular tunes (George A. Custer's band is reported to have played the Irish drinking song "Garryowen" just before the Battle of the Little Bighorn) and specially composed works, such as

"Preussens Gloria" (Prussia's glory), which Johann Gottfried Piefke composed in 1871 for the victory parade at the end of the Franco-Prussian War.

A new development was programmatic concert pieces intended to evoke the experiences of war. Renaissance and baroque composers created bold instrumental works with titles like "The Battle," while classical composers (including Wolfgang Amadeus Mozart and Joseph Haydn) adopted Turkish marches and wrote masses in honor of military heroes (such as Haydn's *Lord Nelson Mass*).

The great flowering of concert war music came in the nineteenth century, though, with great works like Ludwig van Beethoven's *Wellington's Victory* (1813) and Peter Ilich Tchaikovsky's *1812 Overture* (1880), which even incorporates cannon explosions and church bells. The tradition continued into the twentieth century, taking new life in the form of movie sound tracks, such as Sergei Prokofiev's score for the film *Alexander Nevsky* (1938), which celebrates Russia's victory over the Teutonic Knights in the fifteenth century.

The greater availability of sources in the modern era also makes clear what the world's soldiers and sailors were singing. The variety was enormous. Civilian popular songs were always present around the campfires; for example, Teddy Roosevelt's Rough Riders particularly enjoyed "A Hot Time in the Old Town Tonight" during the Spanish-American War (1898). Sometimes popular songs about war were adopted, as when American Revolutionary troops adopted "Yankee Doodle," a ditty originally composed to mock the ragtag colonial levies in the Seven Years' War (1756-1763). Patriotic songs were always popular, such as "Heart of Oak," a Royal Navy march written to commemorate Britain's victories in 1759. The refrain begins: "Heart of oak are our ships, jolly tars are our men," and ends with a resounding "We'll fight and we'll conquer again and again." By the mid-nineteenth century, the first "official" song of a military branch had been created, the "Marine Corps Hymn," in which the singers proclaim, "We will fight our country's battles on the land and on the sea." Such music was used for recruiting as well as among the troops.

Other songs, dear to both civilians and soldiers, continued to reflect on the high cost of war. Some of the most tuneful came from Ireland, whose sons died for centuries in Britain's foreign wars. The early nineteenth century "Johnny, I Hardly Knew Ye," tells of a young man marching proudly to war, only to return blind and crippled. Based on it, the U.S. Civil War's "When Johnny Comes Marching Home Again" (1863) interjected a somber commentary on the human cost of that war. The text is cheerful:

> When Johnny comes marching home again,
> Hurrah, hurrah,
> We'll give him a hearty welcome then,
> Hurrah, hurrah. . . .

The melody, however, tells a different tale, its minor key and dissonance proclaiming that Johnny never in fact came home, and the singers' expectations were doomed to disappointment.

World War I (1914-1918) saw a great outpouring of troop music, both positive and negative, about warfare. Perhaps the catchiest of all the pro-war songs was the American George M. Cohan's 1917 hit "Over There." It proclaims to the world "The Yanks are coming" to join the war, concluding with the bold boast: "We'll be over, we're coming over/ And we won't come back till it's over, over there!" Such a song, penned by an American who had never seen a trench, was simply not enough for the soldiers living through the war, though. The troops wrote their own songs—bitter, often ribald, and harshly critical of their officers. An example is the British "Hanging on the Old Barbed Wire," which tells how sergeants and officers are safe (and often drunk), while the privates are "hanging on barbed wire." It was so inflammatory that the British officers tried to suppress it.

Two novelties stand out in the music of World War II: the conscious manipulation of patriotic ideology by governments and the widespread availability of recorded music. For the first time, troops did not have to make their own music—radios and phonographs provided it for them. The result was certainly a more polished product, like the close harmony of the Andrews Sisters in their 1941 hit "Boogie Woogie Bugle Boy." It could be argued, though, that

the authentic voice of the troops was submerged in the process, as, for example, the Nazis blared the music of Beethoven and Richard Wagner from loudspeakers. Similarly, it must be asked how much composed and disseminated works of patriotism, such as the Russian "Svyaschennaya voyna" (sacred war), which proclaimed a longing to drive a bullet into the forehead of the rotten Fascist scum, really reflected the troops' beliefs. Did all Japanese fighters agree with the theme of their music, that no sacrifice was too great for emperor and land, or did the music teach them to hold such beliefs?

In the wars of the late twentieth and early twenty-first centuries, antiwar themes became dominant. Many were produced during the Vietnam War (like Bob Dylan's 1963 classic "Blowin' in the Wind") and have remained popular ever since. The striking Israeli "Ratziti Sheteda" (1979; I wanted you to know), by Uzi Hitman, is also poignant in its longing for peace. Surely the world has rarely heard such a scathing indictment of war as Benjamin Britten's *War Requiem*, composed in 1962 for the consecration of the new Coventry Cathedral, replacing the edifice destroyed by a German bomb.

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Phyllis G. Jestice

Religion and Warfare

Overview

Religion, inseparable from warfare throughout human history, has changed in significance over time, between contemporary cultures, or even within a nation or culture. War has at times been a ritual process of religious significance, without any competition between dogmas or beliefs. Religion has been a source of inspiration to soldiers, without war having a particular religious purpose. In certain periods, religious conversion or competition has become the very reason for wars to be fought.

Significance

As wars are fought by human beings, who are often motivated by religious beliefs, religion can impact warfare as either an arbiter or actual cause for taking up arms. Many wars have been fought, and continue to be fought, in the name of religion, to impose a revealed truth or to resist encroachment.

History of Religion and Warfare

Ancient World

Ancient warfare was religious in nature. Peoples, nations, or empires generally had their own tribal or national gods, presumed to fight for their devoted worshippers. It was rare for any conqueror to seek mass conversion from one faith to another. Worship of the suzerain's gods might be demanded as an act of submission or to promote imperial unity, but practice of preconquest cults was generally not questioned. The aid of lesser deities, worshiped by conquered subjects, might even be enlisted at times. Alternatively, a conquered people might transfer loyalty to the victor's gods, which had proved to be the more powerful deities. Ancient cultures did not question the existence of one another's gods but competed for favor and power of any god available.

The major exception was the twelve tribes of Israel and Judah, particularly Judah. The foundation of Judaism was a covenant with a single omnipotent God, gods of other nations being "the work of men's hands." Jewish judges, kings, and priests did not seek to bring other peoples into their covenant, as God's chosen people, but proclaimed that Israel's God was the sole ruler and creator of the universe. Military victory was considered evidence of God's intervening to support his faithful chosen. Defeat, in contrast to many neighboring cultures, was not taken to mean that Israel's god had proved weaker than rival gods. It was God's punishment on Israel's people for failing to live up to their obligations under the covenant. The Zoroastrian faith of successive Persian dynasties, including the Achaemenids, Parthians, and Sāsānians, came closest to playing a similar role, which may have made Persian monarchs amenable to supporting renewal of Judaism and rebuilding of the Temple in Jerusalem, after the Babylonian Exile.

In most of the American continents, ancient warfare, endemic on a low-intensity scale, had less religious character, except for that of the Aztecs and Maya. War in both cultures was a sacred duty to the gods, in itself a ritual of worship. Wars also provided prisoners, who could be sacrificed to the gods. Aztec and Mayan warfare also consolidated smaller states and cities under the rule of ever larger empires.

Aryan invaders of the Indian subcontinent celebrated war in their sacred epics, particularly praising "the all out-stripping chariot wheel," which conquered the previous inhabitants, destroying the Harrapān civilization in the Indus Valley. Division of the population into hereditary *varna* and *jats* was an essential part of the Hindu religion, including a warrior varna, the Kshatriya. The conquered population, variously known as Dravidian, "untouchables," or in recent times Dalit, was deemed ritually unclean in

Hindu cosmology. Although Buddhism was by origin a pacifist faith, arising later in the same region, that did not prevent kingdoms that adopted it as official religion from engaging in war.

Christianity in the Roman Empire, prior to the accession of Constantine, was largely a pacifist faith. Christians often refused military service. Not only were officers and soldiers required to worship Caesar, but also military service was deemed to violate the gospel of reconciliation. Saint Maximilian (274-295 C.E.) wrote, "You can cut off my head, but I will not be a soldier of this world, for I am a soldier of Christ. . . ." Origen (c. 185-c. 254 C.E.) wrote that "we no longer take sword against a nation, nor do we learn any more to make war, having become sons of peace for the sake of Jesus, who is our commander."

There is evidence of Christians serving in the Roman armies after 170 C.E., but many served in police or diplomatic functions rather than in battle. After 416 C.E., only Christians were permitted to serve as soldiers in the Roman army—Christianity having become the empire's official religion. Ambrose (bishop of Milan, 374-397 C.E.) and Augustine (bishop of North Africa, 395-430 C.E.) provided the theology of the "just war." The features of a just war included just cause, proper authority, good intentions, and probability of success.

MEDIEVAL WORLD

Christianity and Islam introduced the first wars motivated by advance of religious doctrine. Sāsānian rulers of Persia at times considered the loyalty of Christians within their empire to be suspect, once the rival Roman and Byzantine empires adopted it as official imperial faith. A distinctly organized Christian hierarchy, particularly adhering to the Nestorian heresy, satisfied the demands of Persian patriotism. Kingdoms and empires professing either Christianity or Islam fought over political, religious, financial, and cultural disputes during several centuries. As each religion fragmented into competing schools or sects, internecine warfare against perceived heresies became a recurrent feature of both Christian and Islamic cultures.

Initially disfavored or persecuted by the Roman emperors, Christianity achieved imperial recognition, and then status as official religion, between the reigns of Constantine the Great (r. 312-337) and Theodosius the Great (r. 379-395). Open state persecution of non-Christians, and of Christians adhering to doctrines considered heresy, became well established in Theodosius's reign. Persecution of Jewish communities made the Jews into enthusiastic allies of Persian armies, then of the new Arabic invaders, bringing Islam to the gates of Jerusalem.

Islam was first introduced to communities outside the Arabian Peninsula by wars of conquest, which established the Umayyad caliphate, and its successor, the ʿAbbāsid caliphate. In the second sura, the Qurʾān enjoins believers to fight against unbelievers "until idolatry is no more and al-Lah's religion reigns supreme," but also that "There shall be no compulsion in religion." Both injunctions were reflected in the subsequent conquest.

A relatively small army, inspired by Islam, based on the temporary political unification of the Arabian Peninsula, fell upon both the Byzantine and Persian empires at an opportune moment. The two long-dominant empires had exhausted themselves with thirty years of warfare. Each had burned the other's temples, including the fire temple near Ganzak and the Church of the Resurrection in Jerusalem. Persecution of Monophysite Christians, as well as Jews, further weakened the loyalty of Byzantine subjects. Fewer than twenty thousand soldiers of the Muslim *umma* conquered all of Persia, as well as Syria and Egypt. At first, the Muslim community was more interested in collecting the *jizya*, a tax on unbelievers, than converting the conquered to Islam. Armies were kept in garrisons, separate from the existing cities. Conquered peoples practicing pagan or polytheistic traditions were likely to be offered a choice of conversion or death, while Christians and Jews were free to practice their faith.

Christianity in Western Europe survived the fall of the Roman Empire by conversion of the invading Germanic peoples, who initially worshiped a Teutonic pantheon analogous to those of the pre-Christian Greeks and Romans. Many tribes, including the Visigoths, adopted the Arian heresy. Conversion of a king, and therefore an entire people, was often inspired by desire for victory in battle. Con-

stantine's set the example; he adopted Christianity before his 312 C.E. victory at Rome's Milvian bridge. Chlodowech (Clovis), king of the Franks, adopted Roman Christianity in 496 during a difficult battle with the Alamanni. His subsequent conquest of the Visigothic kingdom, north of the Pyrenees, marked a triumph of Rome over Arianism.

Religiously motivated wars known as the Crusades began more than four and a half centuries after the establishment of the Islamic caliphate. Before 1000 C.E., the ʿAbbāsid caliphs, leaders of the Sunni branch of Islam, had fallen under the rule of Shīʿite princes, while the Shīʿite Fāṭimids had established a rival caliphate in Egypt. By the later 1050's, Turkish armies were clashing with Byzantine armies, which had taken advantage of the weakened caliphate to regain Tarsus, Antioch, and parts of northern Syria. In the 1060's and 1070's, Turkish armies, nominally acting in the name of the ʿAbbāsid caliphs, established a sultanate ruling Iraq, Iran, and parts of Syria, restoring Sunni ascension. Between 1074 and 1798, Western Europe generated a series of Crusades against the rising Ottoman Turkish Empire.

Godfrey of Bouillon, holding a poleax. Leader of the First Crusade in 1095, he became king of Jerusalem.

One feature of the crusades was the formation of professed religious orders dedicated to military purposes. Previously, qualified laymen were considered to have a moral obligation to bear arms in defense of their faith, or specifically at the direction of the Roman church. However, when the Knights Templar (1118-1119) and the Order of the Hospital of Saint John in Jerusalem (1163-1206) became military orders, communities devoted to prayer and service became explicitly institutions of warfare. The notion that the vocation of churchmen denied them the use of force was largely abandoned. The Teutonic Knights, established in 1198, followed a similar pattern.

Modern World

One demarcation of the medieval from the modern world, at least in western and central Europe, was the Protestant Reformation. Following the Council of Trent (1545-1547), Roman popes sought to suppress the Protestant heresy but also fought to reduce the influence of the Habsburg emperors in Italy. While Holy Roman Emperor Charles V fought Protestant German princes from 1531 to 1555, his French (Roman Catholic) rivals often allied with the Protestants and also with (Muslim) corsairs from North Africa. Protestant faith inspired British military rivalry with

Spain, culminating in defeat of the Spanish Armada in 1588 and Dutch independence from Spanish Habsburg rule. In the 1540's, England avoided bankruptcy by funding two-thirds of its military expenses from the sale of confiscated church lands. From 1618 to 1648, a period known as the Thirty Years' War entangled the causes of Protestant religion and German liberty with the national and dynastic aspirations of Sweden, Denmark, France, the Holy Roman Emperor, Habsburg Austria, the Dutch Republic, and Spain.

Library of Congress

An American Bible Society poster designed to solicit public support for a program of providing World War I servicemen with copies of the New Testament.

Since 1700, religion has seldom been the motivator for wars, but it has commonly served as an ideological rationale. The American War of Independence was framed, in part, as an "Appeal to Heaven" from the rule of British monarch George III. Expansion of European colonial empires, in the Americas, Africa, and Asia, was given a veneer of moral purpose by calls to spread the Gospel to the heathen of those continents. Armies, governments, and civilians of almost any belligerent power have invoked prayers for victory and divine protection for those serving in the armed forces. In a world dominated by monotheistic faiths, this means, as Abraham Lincoln said in his second inaugural address, that both sides generally pray to the some God, who cannot answer the prayers of both, and may not answer the prayers of either.

Most modern armies make extensive provision for chaplains to serve the spiritual needs of both enlisted men and women, and officers. Serving as officers in a military chain of command, chaplains are expected to maintain troop morale and serve the assigned military mission, as well as minister to individual soldiers. While some nations have emphasized a single national church in military chaplaincy, a diversity of faiths increasingly requires a variety of chaplains. The United States, with its variety of immigrants, is a model, but Britain has soldiers from dissenting Protestant sects, and a Roman Catholic minority, while many European countries have significant Islamic populations. Germany has established Protestant and Roman Catholic regions, and Latin America has a growing number of evangelical Protestant converts.

A prominent feature of religion in the modern world has been the rise of pacifism in direct opposition to warfare in general. The philosophical basis of pacifism is not modern. Pacifism was never a practical political option, when any valley or city was in constant danger of being invaded by the nearest rival feudal lord, king, or imperial army, for any reason or no reason. The development of large, stable nation-states, with civilian control of the military and periods of substantial peace in parts of the world, gave pacifism a more plausible context. The sheer volume of slaughter in World War I, and the imbalance of co-

lonial wars pitting machine guns against spears, gave pacifism additional moral force. The prospect of worldwide annihilation in an exchange of nuclear weapons gave ominous practical significance to the movement.

Early Christian writers Justin Martyr, Tertullian, Origen, Maximilian, Hippolytus, and Martin of Tours all denounced participation in war as inconsistent with the promise of Christianity, as did Pelagius. The order founded and named after Saint Francis of Assisi was in part pacifist but did not oppose the contemporary Crusades or demand pacifism of the leaders of the Roman church. Humanists such as Thomas More and Desiderius Erasmus also provided some precedent for pacifist thinking, but More, for example, served as chancellor in England, and Erasmus served the Counter-Reformation. Modern religious denominations opposed to war include the Society of Friends (Quakers), Church of the Brethren, and Seventh-day Adventists—but individual members of these churches have served in the military. Among the religiously motivated pacifist organizations of the twentieth century are the Fellowship of Reconciliation, the American Friends Service Committee, the Catholic Worker Movement, and the Catholic Peace Fellowship.

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Charles Rosenberg

Television and Warfare

Overview

Just as the film *All Quiet on the Western Front* (1930) changed the ways that many people looked at warfare, so the presence of warfare in televised media of various types has once again changed public perceptions. Sometimes television programs can change the ways that the public perceives war, and sometimes they can impact how policy makers conduct war. No matter how one regards the relationship of television and warfare, however, the way that television portrays war—whether in news coverage, documentaries, or dramatic fiction—can have an effect on how war is thought about in the abstract, how it is conducted, and how it is remembered.

Significance

Although war coverage on television goes back to its roots in the late 1940's, it was in the 1960's when television first began to have a significant impact. In January, 1968, although the war in Vietnam (1961-1975) was controversial, "Middle America" largely supported the war and believed the statements of President Lyndon B. Johnson, Defense Secretary Robert McNamara, and General William Westmoreland: that the end of the war, in victory, was imminent. That all changed when the North Vietnamese Army (NVA) and the Viet Cong (VC) launched what came to be known as the Tet Offensive, attacking more than thirty cities throughout South Vietnam at once during the Vietnamese New Year celebration week, which was traditionally a time of truce. Television crews were there when the VC breached the gates of the U.S. embassy in Saigon.

Although, as a battle, the Tet Offensive had to be considered a loss for the NVA and VC, it proved to be a victory in the long term. The reason for that victory is the key to the significance of television and war: The American public saw that a victory for their side was not "just around the corner." Public opinion turned quickly against Johnson, McNamara, and Westmoreland. Not long after, Walter Cronkite, news anchor for the Columbia Broadcasting System (CBS), came out against the war, leading Johnson to state, famously, "If I've lost Cronkite, I've lost Middle America."

News Coverage

The first American war to be covered on television was not the Vietnam War but the Korean War (1950-1953). However, the television coverage of the Korean War did not have the impact of the coverage of the Vietnam War, for two reasons. First, in the early 1950's, network broadcast signals reached only half of the country, and less than half of the families in the areas to which signals were broadcast actually owned television sets. Second, the footage of the Korean War was provided largely by military cameramen who worked with black-and-white film and within the format established during the 1930's and 1940's for newsreels distributed to movie theaters. Therefore, although much of the footage of the war shot by these cameramen is vivid and often very moving, it reached relatively few viewers and demonstrated very little awareness of the possibilities peculiar to the new medium of television.

By the mid-1960's, when the American involvement in the Vietnam War dramatically escalated, the television networks had expanded and refined their news shows into centerpieces of their programming and had developed large organizations of overseas reporters and cameramen, rivaling the news-gathering capabilities of the major newspapers and newsmagazines. The crews assigned to cover the Vietnam War competed to "scoop" competitors on important or controversial developments. Their re-

ports from the "battle front," which in Vietnam was just about anywhere, often led off the nightly news broadcasts, and because the cameramen used color film, the conflict had an immediacy that was dramatically new. Indeed, because war had never officially been declared against the Viet Cong and the North Vietnamese, reporting was not anywhere nearly as strictly censored as the reporting on World War II (1939-1945) had been. Families often sat eating their TV dinners while they watched some harrowing footage of firefights in which soldiers on both sides were wounded or killed on camera. The blood was red, and the gore was not always edited out. Moreover, because the draft system meant that every neighborhood and most families had someone serving in the war, the television coverage of its brutal realities not only fueled the radical antiwar movement but also, perhaps more significantly, eroded mainstream confidence in the conduct of the war. Indeed, the turning point in public support for the war effort is often identified as Cronkite's declaration that he believed that victory was no longer possible, if indeed it had ever been possible.

Nonetheless, given the protracted nature of the Vietnam conflict, it eventually became a challenge to show or say anything new about it. Because the news reports were still recorded on film that had to be sent to processing centers, it was also difficult to protect a "scoop." In the mid-1970's, the development of videotape and then the rapid expansion and refinement of satellite transmission would have had a dramatic effect on the coverage of the invasions of Grenada and Panama—but those military operations were so focused, suddenly launched, and quickly concluded that the new technologies had relatively little impact on the coverage of the conflicts.

Then, after Saddam Hussein seized Kuwait in 1990, the United States and its coalition of allies took some months to build a sufficient force on the ground and to reduce the Iraqi military capabilities from the air. The military strictly controlled coverage of this prolonged buildup to what was a very swiftly decisive ground war. News organizations subsequently complained that their ability to cover the conflict with any objectivity had been seriously compromised by military controls. The military and political criticism of reporters such as Peter Arnett, reporting for Cable News Network (CNN)—who remained in Baghdad and provided firsthand reports on the allied air attacks against the military, transportation, and communication facilities in the city (reports that were described as something close to enemy propaganda)—was ultimately mitigated by the American military's own heavy-handed manipulation of the media.

By the time of the war in Afghanistan and the invasion of Iraq, which followed on the terrorist attacks of September 11, 2001, the development of the twenty-four-hour cable news networks created an almost insatiable demand for news and intensified competition among news organizations. In addition, advancements in electronic technologies had turned every cell phone into a camera whose images could very easily be disseminated by e-mail or uploaded to the Internet. The development of blogs and other "new" electronic venues for reportage and news commentary meant that the audience for television news was being further fragmented. Indeed, the Web became a repository for television news clips, whether legitimately or illicitly distributed, and television news programs began to promote "extended" discussions meant exclusively for broadcast on the Web.

Recognizing that all of these developments meant that it could not control coverage of these more geographically dispersed and prolonged conflicts as it had controlled coverage of the first Gulf War, the military developed the strategy of "embedding" reporters with small units. The reporters thus shared the experiences of the troops with whom they traveled and came to see the war largely through their eyes. Coverage of the conflicts was sometimes extremely intense, but each reporter was able to provide a perspective on only a very small part of the conflicts. It is arguable that this strategy diffused and delayed the media attention to the lack of clearly defined strategic goals and plans in both conflicts.

TELEVISION DOCUMENTARIES

Some of the documentaries that have been shown on television were originally developed as newsreel ma-

terial to be shown in movie theaters. They had a major influence on documentaries subsequently produced for television. For instance, during World War II, the renowned film director Frank Capra produced *Why We Fight* (1942-1945), a seven-part series made for the U.S. government and presenting the case for American involvement in all theaters of the war. Although less overtly propagandistic than Capra's series, the series *Victory at Sea*, a twenty-six-episode series first aired in 1952 and 1953 by the National Broadcasing Company (NBC) and narrated by Walter Huston, and Thames Television's *The World at War*, a twenty-six-episode series first aired in 1973 and narrated by Laurence Olivier, both owed a great deal to the style of Capra's series. That style also carried over to CBS's acclaimed documentary series *The Twentieth Century*, which aired each week from 1957 until 1966. Narrated by Walter Cronkite, each episode covered one of the century's most important political and cultural events or figures. The series was reworked, with Mike Wallace as narrator, for broadcast on A&E in the 1980's. All of these documentaries relied on black-and-white archival footage, inspiring the 1999 documentary series *World War II in Color*.

The two major documentary series about World War I have been *The Great War*, jointly produced by the British, Canadian, and Australian Broadcasting Corporations and chiefly narrated by Michael Redgrave, and *World War I*, produced by CBS and narrated by Robert Ryan. Both series were first aired in 1964, marking the fiftieth anniversary of the start of the war, and both consisted of twenty-six episodes.

The major documentary about the Korean War has been *Korea: The Forgotten War*, aired in 1987. The Vietnam War has been the subject of many compelling documentaries focusing on individual battles and campaigns and particular aspects of the war—from the soldiers who cleared enemy tunnel systems to the use of chemical defoliants to the experiences of prisoners of war. However, the two most significant documentary series that provide a broader perspective on the conflict have been *The World of Charlie Company*, aired on CBS in 1970, and *Vietnam: The Ten-Thousand-Day War*, a twenty-six-episode series produced by the Canadian Broadcasting Corporation that originally aired between 1980 and 1982. Not surprisingly, the Iraq War of the early 2000's has already resulted in a large number of documentaries. Of those that have aired on television *Baghdad ER*, which aired on HBO in 2006, has perhaps received the most visceral attention and critical acclaim.

War-related documentaries have largely focused on twentieth and twenty-first century conflicts because there is no archival footage from earlier conflicts on which the filmmakers can draw. Most recently lauded for his documentary series on the World War II, titled simply *The War*, Ken Burns had a profound impact on the application of the documentary form to earlier conflicts with his series *The Civil War*. A nine-part series that aired on the Public Broadcasting Service (PBS) in 1990, *The Civil War* remains one of the most popular programs ever aired on that network. *The Civil War* was groundbreaking because Burns recruited well-known actors and actresses to read letters and journals from combatants and their loved ones, which were voiced over actual photographs of the people, battles, and national events associated with the war, skillfully intercut. Moreover, he found commentators on the conflict—notably historian and author Shelby Foote—who made the history truly compelling without indulging in any melodramatic turns. The producers of the documentary series *The American Revolution* were obviously inspired by Burns's success, but they lacked the photographic archives that Burns had available to him. Thus, in this thirteen-part series originally aired on the History Channel in 2006, they employed actors to portray the famous figures and ordinary people from whose perspectives the story of the war is told. Thus, the documentary series moved very close to the television miniseries.

Television Miniseries

The two most successful television miniseries have both treated World War II. In the 1970's, Herman Wouk's novels *The Winds of War* (1971) and *War*

and Remembrance (1978) were turned into the most costly miniseries in television history. The series featured some major film actors, including Robert Mitchum, who played the scion of a widely dispersed American family that manages to be on the scene in most of the war's major theaters. In contrast, the HBO series *Band of Brothers* (2001) was based on a nonfiction book of the same title by historian Stephen Ambrose and follows an airborne unit from the weeks preceding the D-day landings in Normandy to the mountains of Austria at the war's conclusion.

Other notable miniseries treating wars have included *Julius Caesar* (2002), treating the conflicts that marked Rome's transformation from a Republic to an Empire; *Masada* (1981), depicting the desperate climax of Jewish resistance to Roman rule in 73 C.E.; *John Adams* (2008), dramatizing the second U.S. president's pivotal contributions to the American Revolution; *The Blue and the Gray* (1982), *Gettysburg* (1993), and *Lincoln* (1974), treating the American Civil War; *Holocaust* (1978), personalizing the Nazi genocide against Europe's Jews; *Uprising* (2001), focusing on the Warsaw Ghetto Uprising; *Then There Were Giants* (1994), depicting the Tehran Conference during World War II; *Changi* (2002), documenting the Japanese mistreatment of Australian prisoners of war; *Oppenheimer* (1980), focusing on the physicist who coordinated the effort to develop the atomic bomb; *Nuremberg* (2000), dramatizing the war-crimes trials of surviving Nazi leaders; and *Lord Mountbatten: The Last Viceroy* (1986), capturing the bloodletting that marked the partition of the British raj into the independent nations of India and Pakistan.

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Martin Kich

SOCIETY AND WARFARE

Civilian Labor and Warfare

Overview

Military forces often relied on civilians to fulfill labor and support demands, obtaining weapons, food, and other essential items to enable combat troops to focus on warfare. Civilian laborers built and reinforced structures to help troops withstand enemy assaults and prepare offensive maneuvers. Civilian workers represented both voluntary employees and people forced into labor. In the early twenty-first century, many historians analyzed how occupation forces had coerced or overpowered ethnic groups to perform work to achieve military goals. Some scholars evaluated how gender and race affected civilians seeking wartime employment. Economic and political historians considered civilian laborers' impact on industrial production and legislation during wars.

Significance

Civilian laborers frequently filled manpower shortages at businesses and factories when peacetime workers left for military service. Civilians' work mostly ensured ample production of items, especially weaponry, crucial to military successes. However, fluctuations in civilians' work ethic and inconsistent supplies of laborers impacted the quantity and quality of the military equipment civilian workers manufactured. Some civilian specialists, such as blacksmiths or mechanics (depending on the era in which warfare occurred), applied their professional skills to benefit military troops. Sometimes civilians forced to work for occupying forces sabotaged projects assigned them, hindering enemy troops' effectiveness. Civilian laborers also completed reconstruction work to restore areas damaged by warfare.

History of Civilian Labor and Warfare

Many aspects of civilian labor associated with warfare have been universal in different eras. Throughout the history of warfare, civilian laborers supplemented military endeavors in what often became a symbiotic relationship. Military forces relied on civilians to accomplish necessary support services that enabled troops to concentrate on their orders and not be distracted by time-consuming activities such as securing food. Civilians usually wanted military forces to protect them from enemies during wars. Civilian labor varied from formal, organized systems monitored and financed by governments and military leaders to assistance offered spontaneously when citizens encountered military troops in need of supplies and support.

Incentives for voluntary civilian laborers included patriotism and a sense of duty to their leaders or country. Most workers welcomed the opportunity to help relatives, friends, and neighbors fighting in wars by manufacturing war materials useful to military forces. Warfare offered many civilians income sources to support their families. Wartime civilian workers faced risks and suffered injuries and casualties both in home-front industries and during battlefield assignments. Civilian laborers sometimes became prisoners of war or slaves, depending on the era and conqueror when they lived. After warfare concluded, some civilian laborers retained work similar to their wartime employment, while others became unemployed when veterans returned home.

Ancient World

Power struggles between leaders of ancient civilizations often provoked military conflicts. Histories of ancient warfare, some of them written by those who were contemporary with the events—including Homer, Thucydides, and Plutarch—and biblical passages described activities of warriors defending their

communities or engaging in offensive maneuvers to seize land from rivals. Most accounts omitted details concerning individuals performing labor to assist troops, but generalizations about civilian workers suggested how they participated in warfare. Civilians assisted their communities' military forces by reinforcing shelters, stockpiling supplies, and building roads, trenches, and bridges. Using soil and rocks, civilian laborers constructed defensive structures, including walls around cities and towers for soldiers to post outlooks to detect approaching enemies. Civilian-built barricades protected troops from assaults. Civilian laborers in Assyria and other civilizations aided soldiers by preparing weapons and equipment for sieges. The Bible describes how Solomon forced people he conquered to work to supplement his military resources.

When soldiers traveled to pursue military objectives, their community, including family members and skilled craftspersons and artisans, often followed them. The civilian laborers accompanying Macedonian leader Alexander the Great (356-323 B.C.E.) on his extensive military expeditions were among the best-documented ancient noncombatant workers serving in wartime. A diverse labor group assisted Alexander and his soldiers. Alexander arranged for royal pages to serve him. He ordered servants, known as *ektaktoi*, to monitor his troops' baggage and the livestock transporting it. In addition to overseeing the movement of supplies, the ektaktoi set up tents to shelter troops. Most soldiers provisioned themselves with personal clothing and weapons. Sutlers sold drinks, food, or services to troops not otherwise available. Cooks prepared meals for large groups.

Alexander hired engineers to create weaponry, including catapults, for specific battlefield needs or strategies. Blacksmiths and carpenters contributed their talents to fashion metals and wood into military equipment. Physicians treated battle wounds and sicknesses. Civilians assisted in burying casualties. Some civilian workers met Alexander's intellectual and spiritual demands by serving as historians, scientists, and philosophers to share their observations and insights regarding warfare, foreshadowing the roles of military chaplains, tacticians, and journalists accompanying troops.

Various ancient civilizations' military leaders, particularly those of the Romans and Egyptians, benefited from civilian laborers performing noncombat tasks similar to those provided to Alexander and his soldiers. Many of the roles played by ancient civilian laborers during warfare, including civilians working as spies to obtain military intelligence, continued to be fundamental to military forces in other eras.

MEDIEVAL WORLD

Advances in military organization and weapons technology affected medieval civilian laborers impacted by warfare, who engaged in work resembling that of their ancient counterparts. In Syria, medieval towns were divided into zones to which people were assigned based on their employment status. Zone leaders compensated noncombatant civilians for such services as providing horses for cavalry and transportation, supplying weapons, or performing administrative duties. In 718, when the Umayyad army targeted Constantinople, approximately twelve thousand noncombatant civilian laborers accompanied soldiers into that city. The workers tended mules and camels and distributed food and weapons.

In medieval Europe, monarchs urged civilians to increase livestock breeding for consistent production of swift cavalry mounts and sturdy draft horses for military troops to attain advantages over enemies. Farmers maintained herds to ensure consistent supplies of livestock used for transportation and sustenance. During the late tenth century, weapons manufacturing also experienced changes. Craftspersons, in addition to making more weapons, offered warriors improved designs and varying types to enhance their odds of victory in combat. Regions acquired notoriety for particular weapons, such as Saxony's swords. Medieval ironworkers throughout Europe produced weapons not only for their communities but also to sell to soldiers elsewhere, enhancing local and regional economies.

From the eleventh through thirteenth centuries, civilian laborers accompanied Crusaders traveling to the Holy Land. By the fourteenth century, weapons manufacturing by civilian workers had expanded, and laborers quickly produced quantities of weapons

because they used standard designs and materials. During the Hundred Years' War (1337-1453), feudal military forces utilized peasants for such basic labor needs as gathering forage. Sources estimated that peasant laborers formed half of French feudal armies. In the fifteenth century, iron shortages affected civilian weaponry production in Asia, where previously abundant mining resources had ensured plentiful armories. Gunsmiths cast guns from alternate metals, including bronze. Laborers also made bullets and mixed explosives for gunpowder. They assembled wheeled vehicles to transport large weapons to battlefields.

Warfare waged by the Turkic leader Tamerlane, also known as Timur (1336-1405), affected civilian laborers in medieval Iranian communities. *Gullughchi* were civilian servants who performed such tasks as guarding highways, delivering messages, and tending falcons. Camp followers of Tamerlane's armies consisted of such laborers as druggists, saddle makers, and shoemakers. As Tamerlane secured territory with his military forces, he seized the makers of weapons and armor, including Damascus swordsmiths, to work in Samarqand, his empire's capital. These civilian laborers made arms and protective armor to outfit Tamerlane's troops. Tamerlane ordered workers to construct numerous workshops and residences for armorers adjacent to his palace. Timur's siege-warfare tactics destroyed buildings crucial to communities' military strength, such as the citadel in Herāt. Accounts estimated that approximately seven thousand civilian workers reconstructed that structure.

In medieval Italy, craftspersons were renowned for weapons they produced for military troops and horse armor, such as that made in the Milan workshop of Pier Innocenzo da Faerno. In October of 1427, Francesco Bussone, conte di Carmagnola (c. 1385-1432) led Venetian troops at Maclodio. His soldiers subdued the Milanese army, which surrendered. Carmagnola's forces captured ten thousand soldiers and their weapons. Civilian weapons manufacturers in Milan quickly replaced the confiscated arms by producing sufficient weaponry to supply several thousand infantrymen and cavalry soldiers, enabling them to fight victoriously in later battles.

Modern World

Civilian laborers affiliated with modern warfare experienced more rigid bureaucracy, but women and racial minorities were offered increased opportunities. World War I presented these civilian workers temporary employment as telephone operators, clerks, and medical personnel. After invading France and Belgium in World War I, German troops forced civilians from those countries to work for various labor projects, such as transporting supplies to frontline trenches. In 1915, German military leaders ordered civilian workers to build three defensive trenches in the *Flandern Stellung* and build large concrete structures, which the Germans called *Mannschaften Eisenbetten Understände* (MEBUs). Civilian laborers placed steel in the concrete so the MEBUs could withstand artillery shells.

World War II civilian labor strengthened military forces by providing them sufficient weaponry to fight enemies effectively. In April of 1942, U.S. president Franklin D. Roosevelt selected Paul V. McNutt to direct the War Manpower Commission to oversee procuring civilian labor. Yearly, 53,750,000 U.S. civilian laborers performed work supporting wartime needs. Iconic images of Rosie the Riveter symbolized the influx of North American women into factories to construct aircraft, ships, and munitions crucial for Allied troops to defeat Axis forces. Newsreels depicted the diverse roles the civilian laborers pursued, including agricultural work. Organized labor groups, such as the Transport Workers Union of America, discussed concerns regarding how wartime employment issues affected their members. McNutt dealt with labor strikes, security issues, and absenteeism. Military leaders frequently dismissed McNutt's efforts because he was a civilian, and historians have criticized his administration.

When German troops invaded the Soviet Union in June, 1941, Soviet dictator Joseph Stalin ordered civilians to focus on work that aided troops in what was referred to as the Great Patriotic War. To prevent Germans from disrupting industrial production, Stalin demanded that laborers relocate approximately fifteen hundred factories, steel-rolling mills, and machinery, in addition to 25 million civilian laborers and their families, to eastern areas of the Soviet Union. Nikolai

Alekseevich Voznesensky (1903-1950) outlined plans for evacuating industrial resources, which Council for Evacuation deputy chairman Aleksey Kosygin (1904-1980) oversaw from July through November, 1941. Enemy forces sometimes interrupted transportation by railroad and other vehicles, but eventually most designated Soviet industrial materials were moved. Civilians produced weapons and artillery in Soviet factories. An estimated 11,600 people worked at the Kirov tank factory, which was a significant contributor to Soviet military successes. Soviet workers produced 8,200 airplanes in 1941 and expanded their output to 29,900 airplanes in 1943.

German youths served mandatory two-year German Labor Service terms. In contrast to Allied forces' use of voluntary civilian workers, German military leaders often relied on forced labor. Germans routinely acquired laborers from areas that troops had invaded and occupied. German military personnel also forced many people interned in concentration camps to work; labor of this sort represented one-fourth of civilian laborers working for Germans. German occupation troops also forced civilians to manufacture rope and other utilitarian objects in factories where they had previously worked in peacetime. Japanese military leaders directed forced labor of civilians in Asia to build airfields and military work to sustain troops.

In the twenty-first century, civilian laborers, representing native and international workers—many of them contractors—contributed to work related to the Iraq War. These civilians helped troops by serving in such diverse roles as translators, drivers, and bodyguards. Few civilians expressed interest in performing work associated with warfare in Afghanistan, and as a result, U.S. government officials in the spring of 2009 considered assigning military reservists to those jobs, because they had regularly practiced expertise the military needed, such as engineering, in their civilian employment.

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Elizabeth D. Schafer

Counterinsurgency

Overview

Counterinsurgency, often referred to as COIN by the U.S. armed forces, refers to the attempt by a government to maintain its legitimacy against an armed uprising of a part of the populace. The insurgents may receive external support as well. The government may utilize military, political, economic, and civic actions in the pursuit of preserving itself in power. The single most significant factor in the effort to maintain political control by government when facing an insurgency is retaining the loyalty of the populace at large. Many of the conflicts fought throughout recorded history possess characteristics that serve to qualify them, partially at least, as counterinsurgencies.

Significance

An appreciation of counterinsurgency is significant to a broader understanding of warfare in all periods. Many conflicts over the course of history possessed a counterinsurgency component. At the same time, this aspect of warfare is very often overlooked, as much attention is focused on the insurgency dimension and not the manner in which these uprisings are subdued. Likewise, this is the direction toward which many current military theorists see warfare heading in the twenty-first century, with a great emphasis placed on nonstate actors that seek to undermine the legitimacy of established governments.

History of Counterinsurgency

Ancient World

Among the earliest counterinsurgencies in the ancient period was that of the Jews against the Seleucid Empire, one of the successor states to the empire of Alexander the Great, in the second century B.C.E. At issue was the ability of the Jews to practice their religion. The revolt finally ended when the Seleucids extended religious tolerance to the Jews. The significance here is that the Seleucids received the loyalty of the Jewish people when they were allowed to practice their religion. The Romans, as well, contended with numerous uprisings of peoples whom they sought to control. These included the revolts of the Celtiberians (195-179 B.C.E. and 153-133 B.C.E.), Quintus Sertorius (c. 123-72 B.C.E.), and the gladiator Spartacus, (109-71 B.C.E.). The Roman solution in these cases was usually quite harsh, including scorched earth, the enslavement of peoples who rose against their control, and the colonization of Romans on their lands in order to disrupt the ability of the restive populace to stand against the empire.

The approaches utilized by the Romans for putting down rebellions failed to be effective in the long run. Many provinces of the empire rose in rebellion on several occasions. One method of counterinsurgency practiced in both the ancient and medieval periods was that of constructing fortifications at strategically significant points. This method met with only limited success.

Medieval World

During the medieval period in European history, probably the best-documented counterinsurgency is that of Edward I (r. 1272-1307) against the Welsh. Edward sought to confirm his control over their lands. He succeeded in disrupting the control of the Welsh leaders by waging a simultaneous land and sea campaign through which he managed to disrupt their food supply, thus undermining the legitimacy of the local rulers. In addition, he had the leaders of the revolt executed. Edward likewise dealt with the challenges to his authority in the areas of Scotland that were nominally under his control. The Scots were revolting against English rule in some of the border areas, while the English sought to expand their domination of Scotland. In suppressing these challenges

to his power, Edward tended to make use of fairly harsh methods.

The Hundred Years' War (1337-1453) as well witnessed a fair amount of counterinsurgency, as there were several major revolts in both England and France. These were very much related to the heavy exactions placed on the peasants of both countries in order to wage the war. In France, the revolt was known as the Jacqueline (1358). This insurgency was put down when the leader, Guillaume Caleb, met with the leaders of the French nobility. He was arrested and decapitated. Much the same fate befell Watt Tyler's rebellion in England (1381). In this case, the rebels were following the lead of the French. When they marched into London, King Richard agreed to meet with them. Watt Tyler was killed in front of his people by the king's men. In both cases, once deprived of their leadership the insurgencies lost their momentum and collapsed.

MODERN WORLD

Among the counterinsurgency campaigns that receive the most attention at the start of the modern period is the fighting in the southern states of the United States during the American War of Independence. In the fighting in this theater, both sides resorted to partisan tactics, and both sought to create some semblance of a legal authority. In the south, especially in South Carolina, political legitimacy devolved into a contested ground after the British capture of Charleston in May, 1781. The Whig government was literally on the run, and the British set up a military government. This was as far as British measures went, however. The British failed to reinstall a civilian authority in any of the former colonies save Georgia, while the American revolutionaries under Nathanael Greene reestablished civilian authority in South Carolina and, through his efforts at restoring order, eventually made the Whig side the one with more legitimacy.

The government of revolutionary France faced a number of internal challenges while simultaneously fighting many of its European neighbors. The most persistent of these came from the northern region known as the Vendée (1793-1800). Here several groups of counterrevolutionaries rose up against the Paris government in defense of the local nobility, and even more so of their Roman Catholic religion, which the revolutionaries were attempting to suppress. These conditions led to a challenge to the government's authority. Responses to the rebellion at first fell short of the task of breaking its cohesion. At the same time, there were some very harsh methods employed in the region, such as when hundreds of rebels were drowned by Jean-Baptiste Carrier in December, 1793. The task of subduing the revolt fell to General Lazare Hoche. Hoche lived off the land, and in the process he deprived his opponents of resources. He began with fortified bases and then worked to expand his control. Likewise, he took hostages, whom he refused to return unless the rebels retuned their arms. These methods proved successful at restoring some level of control to the Vendée. It is worth noting, however, that the revolutionary government did not so much gain legitimacy or even acceptance as simply crush the resistance of the populace. The region would rise again during the latter phases of the Napoleonic Wars (1793-1815).

During the Napoleonic Wars, there were several revolts against the emperor's control. The most famous of these was the revolt in Spain that began May 2, 1808, and eventually played a role in the downfall of Napoleon I. There was a revolt in Prussia as well.

In the early nineteenth century, the Greek Revolt (1821-1828) against Ottoman rule sparked some efforts at counterinsurgency operations on the part of the Turks. To a large extent, these efforts were the same as those used against other insurgents, dividing the population and use of violent repression. What makes the Greek Revolt significantly different is that it was one of the first instances in which a foreign state became involved in supporting the insurgents.

The next counterinsurgency operation worthy of note took place in the late nineteenth century, in 1898; the United States went to war with Spain in what has become know as the Spanish-American War. As a result of the Treaty of Paris (1899), which ended the war, the United States took possession of the Philippines. At first, the transition was peaceful, as the United States had previously backed Philippine rebels against the Spanish. When it became clear that U.S. control over the Philippines would not translate into their independence, the insurgents, under their

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The comte de La Rochejaquelein leads a group of peasants during the Wars of the Vendée.

leader Emilio Aguinaldo, took to the jungles against American forces. The initial response of the U.S. military was to utilize standard military tactics against the insurgents. Predictably, this approach met with little success. At the same time, there was resort made to the burning of villages and the indiscriminate killing of civilians, all of which served to undermine the legitimacy of the U.S. government. Two factors contributed to obstruct the momentum of the rebellion. First was the capture of Aguinaldo by an American volunteer named Frederick Funston. Second, more humane methods were used to counteract the rebellion, with a greater reliance then placed on civil government.

In Mexico, in 1911, there arose another civil war—actually a combination of two challenges to government power, one in the north, led by Pancho Villa (Doroteo Arango), and one in the South, led by Emiliano Zapata. Zapata's revolt was among the first insurgencies to place a heavy reliance on certain social classes. The Mexican government responded to the threat with repressive measures that included mass deportations and the confinement of large numbers of the population in concentration camps. In the case of Zapata, while these activities certainly inflicted damage on his movement, they did not destroy it. His resistance collapsed only after Zapata's death in an ambush in 1919.

The aftermath of World War II brought on another series of insurgency and counterinsurgency operations as the Europeans' colonial empires were dismantled through wars of national liberation. The most successful counterinsurgency operation of this period was that of the British in Malaya, referred to as the Malayan Emergency (1948-1960). At first, the British were unsuccessful against the communist-backed insurgents. Then they adopted the plan of

Lieutenant General Sir Harold Briggs. The plan comprised four stages: (1) to create a sense of stability in the populated areas that would lead to solid intelligence on the insurgents; (2) to disrupt the hold of the communist organizations in the populated areas; (3) to isolate the guerrillas from logistical support in the populated areas; and (4) to destroy the insurgents through forcing them into armed confrontations on terms benefiting the government forces. This plan worked very well. Coupled with the military arrangements was support for civilian projects to better the living conditions of the bulk of the Malayan populace.

Finally, in March of 2003, a coalition of nations built around U.S. forces invaded Iraq. The initial military contest was brief and ended resoundingly in favor of the coalition. By the end of the year, however, an insurgency was growing within the country against the occupying troops. Initially, the insurgents inflicted much damage and imposed heavy casualties on the occupying forces. Beginning in 2007, however, there was an increase of troop levels of some 20,000, known informally as the surge. The troops were placed in the most dangerous areas in the country, and by 2009 it appeared that this strategy may have led to a turning point in operations there.

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James R. McIntyre

Education, Textbooks, and War

Overview

Military veterans and officers instruct soldiers how to fight effectively in combat. Lessons often include lectures or textbook assignments describing military history and exercises to enhance physical strength and agility and acquire skills with weapons. Military education emphasizes discipline and organization to achieve warfare goals. Nonmilitary schools incorporate warfare discussion in curricula for varying objectives. While some educators tell pupils facts, other teachers present versions to satisfy government requirements. In the early twenty-first century, some military historians shifted from institutional studies of how specific military academies, service branches, and governments educated troops to examining warfare's role in diverse cultures, people's perceptions of war, and educational depictions influencing them.

Significance

Education provides credentials for soldiers to advance professionally within the military. Academic accomplishments reinforce peers' and subordinates' respect for officers' authority. Military histories educate commanders to make decisions such as when to go to war, continue fighting, or withdraw forces. Textbooks, intended for either military personnel or school-age students, deliver narratives designed to achieve specific goals. While military textbooks train soldiers, many school history textbooks emphasize positive aspects and ignore controversial topics. Some educational resources misrepresent military history intentionally with rhetoric and propaganda to promote nationalism. Ideas presented by textbooks shape how students view warfare and influence their attitudes toward their country's military forces—motivating them, for example, to consider serving as adults.

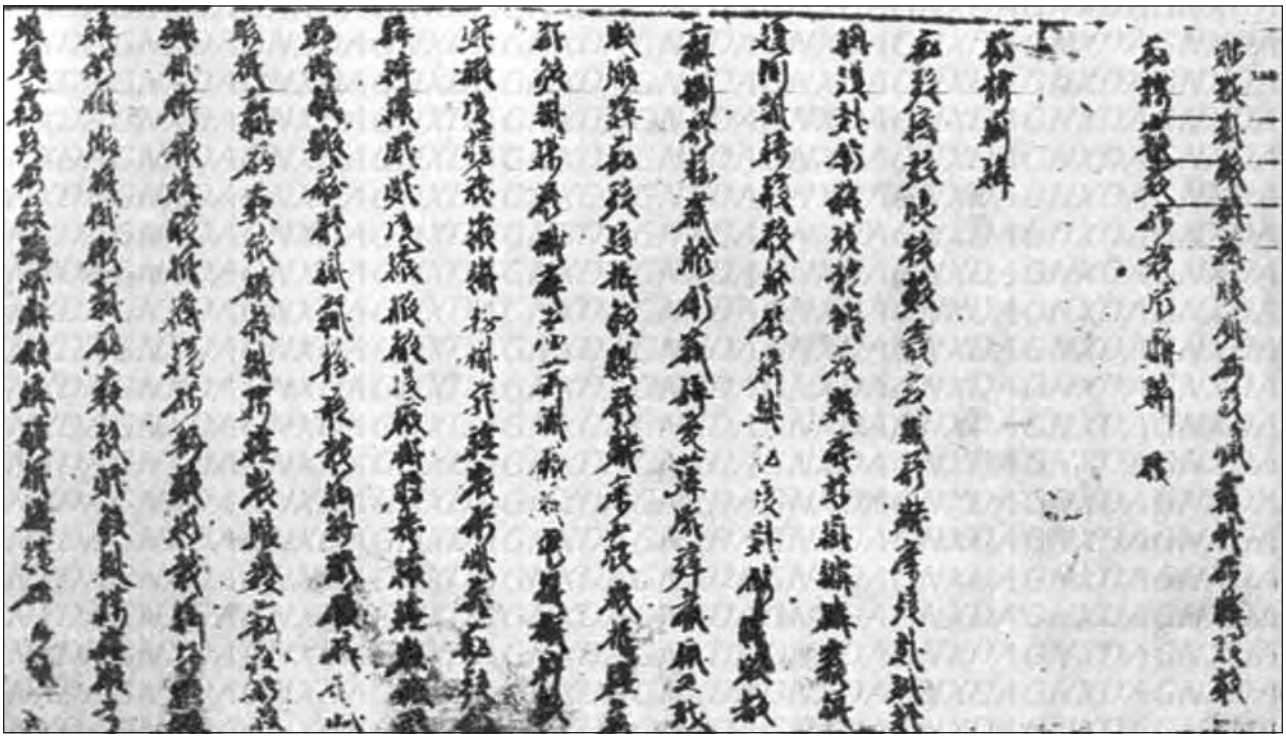
History of Texts, Education, and War

Throughout history, boys participated in games and activities such as hunting as a form of early military training. Formal educational experiences prepared soldiers and officers for warfare. Handbooks and instructional guides provided information soldiers needed to perform their duties and respond to wartime demands. Some military schools incorporated military history and theory into lectures and assigned books, often written by instructors and veterans, for cadets to study. Troops bonded by sharing training, rituals, and sacrifices. Warfare impacted people according to the historic period and geographical region in which they lived and how essential military power was for their leaders to secure control. Civilians' comprehension of history and awareness of military books and tacticians' concepts often shaped cultural responses to warfare.

As social ideas regarding childhood changed, educational opportunities for children expanded in the nineteenth and twentieth centuries. Many schools used textbooks that featured notable military figures, battles, and wars. Lessons often emphasized military role models and successes from ancient times through contemporary events to encourage children to be patriotic citizens and feel pride for their country. Discussion of atrocities and defeats was often omitted or dismissed as irrelevant. Publishers, authors, and educators exhibited varying degrees of accountability regarding textbooks' role in educating children about warfare.

Ancient World

Historians consider Sunzi's *Sunzi Bingfa* (c. fifth-third century B.C.E.; *The Art of War*, 1910) to be the first known military text. Initially available in ancient Chinese territories, this work influenced contemporary military and political leaders and extended its impact through time, continuing to shape



A Tangut script of Sunzi's Art of War *(c. 510 B.C.E.), one of the oldest texts on military theory.*

warfare in the twenty-first century. Sunzi (Sun Tzu; c. 544-c. 496 B.C.E.), whose identity many historians question, emphasized the role of warfare in maintaining effective governments to prevent their failure and submission to other powers. The text, no matter who wrote it, contains universal principles that have been appropriated in warfare for centuries since it was written. In ancient China, Qin emperor Shi Huang credited *The Art of War* for tactics to conclude military strife during the Warring States period. Translations expanded the influence of *The Art of War* to diverse cultures and commanders in other eras. Many modern U.S. military school curricula adopted *The Art of War* as a strategy textbook.

Ancient military narratives influenced Alexander the Great (356-323 B.C.E.) of Macedonia and empowered him as a general. His father, King Philip II, arranged Alexander's military training, ordering teachers to instruct his son in horsemanship and weaponry. Philip secured philosopher Aristotle's services as Alexander's academic tutor. Aristotle's lessons encouraged discussion of historic events, including battles. Aristotle gave Alexander a copy of the *Iliad* (c. 750 B.C.E.; English translation, 1611), by Greek poet Homer, with annotations he had added. The *Iliad* shaped Alexander's view of warfare. Fascinated by Homer's depiction of the Trojan War (c. 1200-1100 B.C.E.), Alexander admired the protagonist, Achilles, from whom Alexander believed he was descended, and aspired to achieve similar triumphs. Alexander possibly also read military accounts by historians Herodotus, Thucydides, and others describing actions during the fifth century B.C.E. Peloponnesian War and Persian Wars.

Those texts influenced how Alexander responded to his early military actions and envisioned his responsibilities as a leader, planning logistics and organizing personnel at the Battle of Chaeronea (338 B.C.E.). Alexander trained his soldiers much the way his father had, instructing troops regarding battle formations and how to use pikes, swords, and other weapons. He emphasized drills to prepare his warriors, many of whom engaged in training to fulfill requirements demanded of citizens, for potential bat-

tlefield situations and reinforce discipline. When Alexander's army reached such Trojan War battle sites as Troy in 334 B.C.E., Alexander, whose copy of the *Iliad* accompanied him on military campaigns, paid tribute to the warriors who had fought at those sites and visited Achilles' tomb.

Other ancient military handbooks influenced contemporaries' perception of war. Many ancient people were constantly confronted with warfare and its obligations and incentives, such as assuring citizenship through service. Britannia governor Sextus Julius Frontinus (35-c. 103 C.E.) wrote *Strategematicon libri iii* (late 80's C.E.; *Strategematicon: Or, Greek and Roman Anecdotes, Concerning Military Policy, and the Science of War*, 1811), which shaped commanders' ideas on the deployment of military troops. Arrian (c. 89-155 C.E.), noted in *Tactica* (c. 136/137; on tactics) that the Romans had adapted some military moves from the Celts. In the late fourth century, Flavius Vegetius Renatus (fl. fourth century), a Roman finance minister, compiled the most enduring ancient military handbook, *Epitoma rei militaris* (c. 384-389 C.E.; *The Military Institutions of the Romans*, 1767), usually referred to as *De re militari*, which he created to instruct military and government leaders. Historians lack proof that Vegetius's handbook affected how ancient commanders conducted warfare, but it became part of the medieval military canon.

MEDIEVAL WORLD

Army and naval commanders during the Middle Ages were aware of books written by ancient military historians and tacticians. Vegetius's *De re militari* was a frequently mentioned ancient text in medieval military histories and often was copied for military and political figures. Literate medieval people read *De re militari* because it provided access to Roman thought and concepts. Roman military information intrigued medieval readers curious about ancient warfare and its possible applications to their military needs. Contemporary sagas, such as the *Slovo o polku Igoreve* (c. 1187; *The Lay of Igor's Host*, 1902), revealed that medieval people had contrasting cultures regarding warfare; during the Middle Ages, people were motivated to fight by different factors, including honor, glory, dutifulness to rulers, chivalric expectations, and religious beliefs.

Some copyists revised ancient handbooks to meet conditions in their location and time. Freculph, bishop of Lisieux (fl. ninth century), gave his edited copy of Vegetius's handbook to Charles the Bald, stating that it could help military leaders form effective fighting techniques to resist Viking attacks in the mid-ninth century. By the thirteenth century, a French translation of Vegetius's handbook was distributed. In the fifteenth century, craftspersons used the printing press to produce copies of *De re militari*. Various histories stated that notable medieval commanders took copies of Vegetius's handbook into battle, but no evidence verifies that they applied this guide in combat.

About 856, King Lothair II commissioned Rabanus Maurus (c. 780-856), a scholar and church leader, to appropriate Vegetius's work to write a revised handbook entitled *Recapitulatio* (recapitulation). Rabanus selected text that was relevant to medieval warfare, including such topics as weaponry, strategies, and tactics. Other medieval military handbooks included one credited to Emperor Maurice (Flavius Tiberius Mauricius, c. 539-602) entitled *Strategikon* (*Maurice's Strategikon: Handbook of Byzantine Military Strategy*, 1984), which was distributed around the year 600. The Frankish count Nithard (790?-844), whose grandfather was Charlemagne, wrote *Historiae*, or *De dissensionibus filiorum Ludovici pii* (c. 843; on the dissensions of the sons of Louis the Pious), in which he described military training and drills for Carolingian horse soldiers. Students might have had access to these handbooks at military schools, especially at the Carolingian monastery, Saint-Riquier, where *milites* (soldiers) associated with the royal family lived and trained. Despite references to Vegetius, Rhabanus, and other military theorists in histories, sources are unclear on whether medieval military officers actually read those books and utilized their concepts in warfare.

Contemporary reception of *Dell'arte della guerra* (1521; *The Art of War*, 1560) by Niccolò Machiavelli (1469-1527), is better known. Machiavelli, who served the Florence government as a secretary, mod-

eled his book on *De re militari*, copied some of Vegetius's concepts, and discussed such medieval figures as Francesco Sforza and Cesare Borgia. Many of Machiavelli's contemporaries were more familiar with those of his works that focused on politics, but *The Art of War* generated greater immediate impact than its medieval predecessors by shaping Florence's military organization and warfare objectives. Machiavelli's treatist suggested that using citizens instead of mercenaries as soldiers could educate the populace about warfare's realities, develop civic values, and reinforce people's commitment to serve. Machiavelli stated that personal involvement with warfare would unify populations and prepare citizens to defend their government loyally and unconditionally, unlike foreigners hired to fight. Many scholars emphasize that Machiavelli's *The Art of War* introduced modern concepts relevant to military theory and practice.

MODERN WORLD

By the nineteenth century, warfare had begun a transition which Carl von Clausewitz (1780-1831) addressed in his book *Vom Kriege* (1832; *On War*, 1873). Clausewitz stressed the role of government policies in shaping warfare. Notable officers who stated that they had applied Clausewitz's concepts to their military strategies include Helmuth von Moltke (1800-1891). Although many British and American military leaders criticized Clausewitz, the Vietnam War (1961-1975) altered resistance to Clausewitz's theories as commanders realized how governments' decisions affected military performance. At the U.S. Army War College, Colonel Harry Summers conducted a Clausewitz study and published *On Strategy: A Critical Analysis of the Vietnam War* (1982). Many military colleges incorporated *On War* into their curricula.

Critics and supporters wrote articles and books examining, and often misinterpreting, Clausewitz's works. Sir Basil Henry Liddell Hart (1895-1970) was one of Clausewitz's most vocal critics. He denounced Clausewitz for promoting total war, which Liddell Hart thought had shaped World War I commanders' actions and caused high casualties. Liddell Hart urged armies to become mechanized with tanks. Some historians credited Liddell Hart's writings with inspiring German officers, including Erwin Rommel, to create Blitzkreig tactics. Liddell Hart emphasized the need for more historical warfare studies in educational curricula in his *Why Don't We Learn from History?* (1944).

Before World War I, some U.S. educators wanted high school boys to receive military instruction that would condition them physically and mentally for war and to provide their communities security. Teachers belonging to the American School Peace League spoke against that training. Those pacifists were mostly successful in preventing mandatory military education in U.S. schools, but many countries prepared their students educationally for potential warfare roles.

Courtesy, USMA Public Affairs Office

The United States Military Academy, looking north along the Hudson River.

Courtesy, U.S. Air Force Public Affairs

Basic cadets salute during their first reveille formation at the United States Air Force Academy in Colorado Springs, Colorado.

After World War II, the Japanese Ministry of Education told educators to ink out military sections in textbooks to appease U.S. occupation forces. The Supreme Command for the Allied Powers (SCAP) required new Japanese textbooks written by professional historians to replace educational resources deemed to be unsuitable. In 1946, historian Saburō Ienaga (1913-2002) wrote *Shin Nihonshi* (1947; new Japanese history), which emphasized themes of democracy, pacifism, and truth. His book *Taiheiyō sensō* (1968; *The Pacific War: World War II and the Japanese, 1931-1945*, 1978) acknowledged Japan's war crimes in Nanjing, China.

During the 1950's, Japan's education ministry rejected books it considered contrary to values they wanted Japanese children to acquire, including Ienaga's books (unless he would agree to revise them). By the mid-1960's, Ienaga initiated litigation against the ministry, stating its textbook selection was unlawful. He complained that the ministry had insisted he revise discussion of Japan's military aggression against China, Korea, and the Philippines. In the 1990's, Tokyo University education professor Nobukatsu Fujioka publicly endorsed textbooks that glorified and often embellished Japanese history and excluded historical figures and events he considered negative.

Japan's supreme court affirmed the ministry's textbook selection as constitutional in 1997 but stated that all revision demands should be compatible with historical scholarship. Fujioka established the Atarashii Rekishi Kyōkasho o Tsukurukai (Japanese Institute for Orthodox History Education), which produced a textbook incompatible with historical

facts. The ministry's approval of that textbook provoked criticism throughout Asia. Numerous Japanese historians and educators stated that it inaccurately perpetuated myths and included flawed interpretations. Most Japanese school districts refused to use it. Historians worldwide voiced concerns about textbooks presenting military history responsibly to students.

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Elizabeth D. Schafer

Paramilitary Organizations

Overview

Prior to the establishment of standing armies, groups of people armed themselves for their own protection, and essentially this is the origin of the many paramilitary organizations that have existed since ancient times. These groups had commanders and "officers" who held military ranks, and they were armed, but the difference between them and armies was that central authorities did not control the paramilitary organizations and they operated on a basis similar to that of some militias today. During the late twentieth century, the term "paramilitary group" tended to be used for armed groupings, which come together for a political purpose, often armed illegally. However, there are many instances in which the division between paramilitary groups, militias, and other armed groups are blurred.

Significance

Throughout history, paramilitary groups have played a major role in determining political control of particular parts of countries, and they have been prominent in local affairs. They have been especially important in civil wars, the control of civilians, and keeping some governments in power, as well as unseating (or attempting to unseat) others. In full-scale warfare, they are usually "outgunned" if they are fighting regular armies, although the nature of paramilitaries has often meant that they can blend into the general civilian population, which, in turn, has meant that they have had success in guerrilla warfare, insurgencies, and periods of civil strife.

History of Paramilitary Organizations

Ancient World

In the ancient world, militias and local armies effectively controlled towns. However, with the emergence of large empires, localities continued to have means to protect themselves from local banditry or sudden incursions from their neighbors by raising small forces. Owing to the scanty nature of information from much of the ancient world, there is academic debate over the exact nature of some of the military forces that operated and whether or not they had a degree of central control. An example is the army of Hannibal (247-182 B.C.E.), which, although it was referred to as the Carthaginian army, may in fact have its origins in a paramilitary force raised by his father, Hamilcar Barca, in Spain. By contrast, the soldiers raised by Marcus Licinius Crassus in Rome in 71 B.C.E., against Spartacus, although paid for by Crassus himself, were put at the disposal of the Roman government (admittedly led by Crassus) and were therefore not paramilitaries. There is also clear evidence that some of the armies during the "barbarian" invasions of the Roman Empire operated with sufficient autonomy to imply that they might also have been paramilitary forces. Indeed the fall of the Roman Empire—essentially with the collapse of central authority—led to the formation of regionally based military groups to protect cities, towns, and villages.

Medieval World

The lack of central authority in the medieval world resulted in the formation of local militia groups and essentially in the paramilitary groups as they exist in the modern world. This occurred in parts of Germany, along the eastern borders of Europe, and for

periods in France. In England, the Wars of the Roses (1455-1485) were essentially a battle between paramilitary forces raised by respective landowners. As the feuding families of medieval and Renaissance Italy needed their own soldiers, their paramilitaries, often augmented by the hiring of mercenaries and alliances with regional powers, came to dominate Italian politics for centuries. Mercenary bands such as the White Company of Sir John Hawkwood in the fourteenth century were also paramilitary groups, as were the followers of Cesare Borgia in Italy after the death of his father, Pope Alexander VI. Also in Spain during the Reconquista, paramilitary forces operated from regional powers that were involved in alliances with and against the Moors from the twelfth to the fifteenth century.

MODERN WORLD

The European voyages of discovery led to the establishment of large colonial empires and powerful chartered companies such as the British East India Company and the Dutch Vereenigde Oost-indische Compagnie (VOC, or Dutch East India Company). Most of these companies maintained their own armed forces (and navies), which had military ranks and raised soldiers both from the homeland and in their new possessions. These sometimes fought alongside colonial armies. This was particularly the case with the armies and navies of the British East India Company, which did not integrate its armed forces with those of the British Army and British India until 1858. Prior to this, and certainly before the 1830's, the British East India Company was involved in waging wars of aggression without needing to get prior agreement from the British government.

In the cases of civil wars such as aspects of the Thirty Years' War (1618-1648) and the English Civil Wars (1642-1651), councils and wealthy individuals raised their own forces, which were sometimes put at the disposal of the main commanders but often were involved in local skirmishes or the defense of their own property or town, making them effectively paramilitaries.

The best-known paramilitary forces have operated in the twentieth and twenty-first centuries. In Germany after World War I, there were problems with law and order. The result was that certain groups were formed, the most famous being the Freikorps, which first appeared in December, 1918, mainly composed of former soldiers and taking the name from a similar force that had appeared in the eighteenth century. Essentially the storm troopers and the Sturm Abteilung (SA) of Ernst Röhm, during the period of the rise to power of the Nazi Party up until 1931 and during the German occupation of much of Europe, operated as paramilitary groups. Certainly the Blackshirts in Italy, who helped Benito Mussolini come to power in 1922, had a similar role. There were also pro-Fascist groups in other countries who marched in uniform and sometimes, when possible, carried weapons. These included the Falange in Spain, the Blue Shirts in Ireland, the Blackshirts of Sir Oswald Mosley in Britain, and possibly even the New Guard in Australia. Certainly not all the paramilitary groups were of the political right; socialist, communist, and anarchist militia groups operating in Spain during the Spanish Civil War (1936-1939) usually supported, and often fought alongside, the Spanish Republican forces but occasionally fought against each other. It could even be argued that the International Brigade during that war was essentially a paramilitary group, especially given that it drew people of many nationalities and followed various commanders.

During World War II, the Germans sponsored many paramilitary groups who fought alongside them in parts of Russia, the Balkans, and other parts of Europe. Some of these groups, especially in the Baltic, in Poland, and in the Ukraine, became heavily associated with the atrocities against Jews and other people there. While many of the groups fought alongside the German forces, and quite clearly had the support of them, sometimes their exact nature is still debated by historians. Mention should also be made of the Fascist Militia in France, which operated on a paramilitary basis, again with the support of members of the Vichy government (but often not at its behest). On the opposite side during the war, the partisans in Yugoslavia, Albania, and Italy, as well as other countries, essentially operated as paramilitary groups, as did some Free French forces in 1944 and 1945.

Following the Chinese Revolution of 1911 and the fragmentation of the country, many warlords established their own "armies," again as paramilitary groups, sometimes allied with the government but often able to control civilians in areas that had achieved a degree of local autonomy. One example is the group led by Zhang Zulin (Chang Tso-lin, also known as the Old Marshal or Mukden Tiger) in Manchuria. His forces were armed and trained, controlled a significant part of the country, but only loosely took orders from the central government. As a result, technically until the Northern Expedition, the armies loyal to the Guomindang (Kuomintang) from southern China were also essentially paramilitaries.

In Ireland, there were also paramilitary groups formed along religious and political lines. The Irish Republican Army, which was led by people holding military rank, and for official occasions dressed in uniforms, was also a paramilitary group—although labeled by its opponents as a terrorist organization. While it served to oppose the British army first in Ireland and later in Northern Ireland, the Ulster Defence Association was established in 1971 to support British rule in Northern Ireland, and uniquely it was a legal organization with its commanders able to use military ranks, although they were not allowed to use weapons.

During the civil war in Lebanon from 1975, many militia groups emerged, including Amal for the Shīʿites, the Druze militia of Walid Jumblatt, the Falangist militia of Pierre Gemayel and then Bashir Gemayel, and later Hezbollah. All these groups were effectively paramilitary groups, as were the Palestinians based in Lebanon during much of this time. Discussion of paramilitary groups in Lebanon is also problematic because of the success of some paramilitary leaders who have attained political power. This could be seen with the election of Bashir Gemayel, leader of the Falangist militia, as president of Lebanon and then, after his assassination, the election of his brother Amin Gemayel and the subsequent assumption of power by Michel Aoun. As commanders of one of the most powerful paramilitary groups in the country, they were also heads of the government.

In many cases there are also instances when secretive paramilitary forces have been used to work alongside the official military but in roles from which the military have shrunk. These include militia groups in Indonesia involved in "the Killings" in 1965 and the destruction of East Timor in 1999, and the "death squads" in many Central American countries during the 1980's.

Many paramilitary groups have emerged in Africa. Some have been made up of colonists opposed to independence, such as the Algerian supporters of the 1960 Barricades Revolt in Algiers. In the 1990's, paramilitary militia-style groups in regions of Africa gained considerable notoriety, among them the Interahamwe in Rwanda and the Janjaweed in the Darfur region of Sudan. Although both these groups operated with significant support from their local governments, they operated with considerable local autonomy. To complicate matters, attempts for independence by people in Biafra and Katanga led to wars that the central governments in Nigeria and the Congo, respectively, saw as resistance to "illegal" paramilitary groups rather than the suppression of independence movements. Similar arguments can be made over whether the African National Congress (ANC), National Union for the Total Independence of Angola (União Nacional para a Independência Total de Angola, or UNITA) in Angola, the Mozambican National Resistance (Resistência Nacional Moçambicana, or RENAMO), and the Polisario Front are, or were, paramilitary groups. In South Africa as it moved toward majority rule in the early 1990's, the Afrikaner Weerstandsbeweging (AWB), led by Eugène Terre'Blanche, which was opposed to the end of apartheid, effectively turned itself into a militia, with its supporters wearing military-style clothing, carrying weapons, and becoming involved in events such as driving into Bophuthatswana in 1994 as part of the paramilitary Afrikaner Volksfront. Similarly, it could be argued that the Zulu groups, armed with "traditional weapons," were effectively a paramilitary group, as possibly were the "war veterans" involved in land seizures in Zimbabwe in the 2000's.

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Justin Corfield

The Press and War

Overview

The notion of the fourth estate—the "press" (or the "media")—has evolved over human history from oral recitation through the advent of print to the current digital age. The ability of the press to cover conflicts has also evolved, as have the objectives of those who announce and write history, including modern journalists and others who purport to report the "news." Issues specifically attached to the media during wartime have included how to obtain and disseminate information to the public, the inevitable conflict between the media and the state, and their competing interests during wartime. The role of technology has had a particular impact—from the invention of the printing press (fifteenth century) to the modern era of the Internet—on how information is gathered and distributed by the media from the battlefield to people's living rooms and how the public is influenced by the media's coverage of war.

Significance

The relationship between the media and the state during wartime has often blurred the distinction between information and propaganda and created the conflict between censorship and the "right to know." Both institutions have competing agendas: the state's desire to control the distribution of information, especially information that might be embarrassing or harmful to wartime objectives; and the media's mission to obtain the truth and to inform the public. It is especially during the last 150 years, with the rise of democracies and the accelerating pace of technology, that the conflict between the media and the state during wartime has intensified.

History of the Press and War

Ancient World

In the ancient world, all news was spread by word of mouth. Even with the advent of writing, the great majority of ancient peoples were illiterate, and thus all information was restricted to an elite of scribes and rulers. The stories behind the great epics of the Greeks, such as Homer's *Iliad* (c. 750 B.C.E.; English translation, 1611), were originally told orally and retold through the generations. It was through trade that people were exposed to information and ideas. In ancient Greece, the *agora* of Athens and other cities served as a forum where all kinds of news was exchanged.

Getty Images

CNN's Peter Arnett reports from Iraq during the Gulf War in 1991.

Ancient Romans received their daily news at the Forum through reading placards. The placards fed the Romans' desire for news about life abroad. Most of all, the baths were a favorite gathering place for Romans of all classes, where they could exchange news and the daily gossip. The *Acta Senatus* and the *Acta Diurna* served as the means by which Romans could learn about their government and their empire. Julius Caesar (100-44 B.C.E.) had written treatises on the Germanic tribes he encountered in his campaigns in Gaul, but they did not have the current feel of a modern newspaper. Unlike the modern newspaper, however, placards reported facts only randomly, without any kind of editorial oversight. There was no criticism of government policies during peace or war.

MEDIEVAL WORLD

The collapse of the Roman Empire meant a total breakdown of society. Because of the collapse of the political order, the infrastructure and security that made an urban and cosmopolitan way of life possible simply disappeared. In Western Europe, people were reduced to a far simpler way of living. Between 500 and 1000 C.E., invasions by "barbarian" tribes made the world of the "Dark Ages" unpredictable. Life was more isolated, and information much harder to come by. Knowledge of the first few centuries of the Middle Ages survived only through the work of a handful of monks and chroniclers.

By the High Middle Ages, between about 1000 and 1300, Western Europe had recovered a degree of civilization with the rise of towns, but nowhere near the same level of sophistication that had thrived under the Romans. Tales of war, courtly love, and chivalry became popular as minstrels and troubadours spread news about far-off lands through verse and song.

MODERN WORLD

The emergence of the modern newspaper can be traced to the seventeenth century. Prior to this, town criers and heralds announced royal proclamations. Eventually, they would be replaced by circulars and printed journals. The precursors of the newspaper were the *nouvellistes*, who scoured the country for the most recent news, which included news about politics, literature, the arts, and the mundane. The nouvellistes also recorded the wars of Louis XIV.

In 1631, a physician named Théophraste Renaudot (1586-1653) founded the *Gazette de France*, the first modern newspaper. His goal was "to get at the truth." The earliest examples of wartime correspondence were letters, called *corantos*, that dated from the Thirty Years' War (1618-1648), mixed with personal stories and travelogues. These letters were duplicated through the printing press and were distributed to a larger public. The prototype of the wartime correspondent was an anonymous writer for the *Swedish Intelligencer* who reported the accounts of King Gustavus Adolphus. Like modern newspapers, the *Swedish Intelligencer* had a bureau in London, but unlike modern journalists, the writers of the *Swedish Intelligencer* did not go out to the field to get firsthand information; instead, they depended on the word of gentlemen of high rank and on other secondary sources.

After the Thirty Years' War, newspapers began acquiring their present characteristics. Newspapers began establishing foreign bureaus where people would pass on firsthand accounts. By the eighteenth century, newspapers were becoming the dominant source of information. English newspapers could freely publish without censorship, while French and other European newspapers were kept under political scrutiny. When it came to wartime, however, all newspapers were under tight government restrictions and were almost entirely dependent on the government for information.

The wars of the French Revolution (1789-1793) and the Napoleonic Wars (1793-1815) opened an opportunity for the development of war correspondence. The events of the French Revolution attracted British journalists, who reported as "our Correspondent in Paris." One prominent example is that of Robert Cutler Fergusson, who was in Paris between 1792 and 1793 to report, firsthand, history-making events such as the massacre of the Swiss Guards by the women of Paris, the attempted flight of the royal family, and the meetings of the Legislative Assembly, which ultimately convicted Louis XVI and Marie-Antoinette. French newspapers recorded the activi-

AFP/Getty Images

A pedestrian passes by a television screen in Seoul during a report about a North Korean missile launch on July 4, 2009.

ties of Napoleon's armies, based on the information provided them by the official bulletins posted by Napoleon Bonaparte (1769-1821). These dispatches were also printed in English newspapers, with the caveat that they might be unreliable, since they came from French sources. English journalists countered French bulletins by pointing out their inconsistencies; however, any other sources beyond those of Napoleon's armies proved very difficult to obtain.

Official information from generals and admirals did not make for exciting reading to the larger public. For example, during the Peninsular War (1808-1815), Arthur Wellesley, the the duke of Wellington (1769-1852), provided such dull and uninspiring dispatches that they gave the impression of defeat, when in fact the British were successful in hampering Napoleon's objectives in Spain. Another challenge to war correspondents was the slow pace of mail couriers. Newspapers had to be mindful of placating postal officials, both foreign and domestic, or risk missing a "scoop." The Continental System established by Napoleon had the unintended effect of making British newspapers prized on the Continent. By the end of the Napoleonic Wars, British newspapers such as *The Times* had refined their information-gathering methods and themselves became the source of information for the British government when it sought updated information on Napoleon's forces.

By the middle of the nineteenth century, the modern newspaper was undergoing an evolution: The formerly haphazard means of gathering information were becoming more structured and standardized, leading to the sophisticated media organizations recognized today. American journalists such as George William Curtis for *The New York Times*, Margaret Fuller for *The New-York Tribune*, Charles A. Dana, William Cullen Bryant, and Theodore Sedgwick competed with their European counterparts for breaking news on the battlefield. Correspondence on the Mexican War (1846-1848) showed that American jour-

nalism had come of age. First, the new technology of photography allowed this conflict to be the first to be photographed. American war correspondents—unlike their dignified and restrained European counterparts—reported directly from the battlefield and even fought on the battlefield. George Wilkins Kendall of the New Orleans *Daily Picayune* captured a Mexican flag and acquired the title of major. American newspapers jostled with each other to get the first scoop on the latest fighting. The telegraph, which had just been invented at the outset of the war, had not yet realized its potential. Thus, newspaper agencies still depended on courier services. Coverage of the Mexican War suited every appetite for news, describing everything from the tactical and strategic aspects of the conflict to human-interest stories and letters to home.

The Crimean War (1853-1856) marked a turning point in wartime correspondence. Newspaper organizations began the organized practice of using a civilian reporter to inform the general public. The age of the newspaper correspondent dawned with William Howard Russell (1820-1907). His journalistic career began when he was hired by *The Times* in 1841 to cover elections in Ireland. He first covered the Crimean War in 1854, when editor John Thaddeus Delane (1817-1879) of *The Times* assigned him to cover a British force in Malta. When Russell arrived at Gallipoli, he saw firsthand the conditions of the British army, which was supposed to be fighting the Russians. He was dumbfounded at the unsanitary conditions the injured soldiers had to endure and the incompetence of the officers, who came from the aristocracy. Upon observing these conditions, he faced the dilemma of whether to publish his findings to *The Times*. Delane encouraged Russell to continue reporting. As the editor, Delane selected which of Russell's reports were fit for public consumption and which he would distribute privately to the government, which led to the collapse of an entire cabinet.

Another effect of Russell's reports on the lot of the ordinary British soldier was that they inspired Florence Nightingale to lend her services, which in turn led to the modern nursing profession. While Russell was reporting on the conditions of the British army, the British government, perhaps instigated by Prince Albert, sent royal photographer Roger Fenton (1819-1869) to counter Russell's reports on incompetence and suffering. Fenton portrayed British soldiers as happy and well dressed in order to maintain public support for the Crimean War. The Crimean War established the practice of the special correspondent, the role Russell most exemplified. His example would be emulated by future war correspondents throughout the rest of the nineteenth century, from the American Civil War to the Boer War.

World War I (1914-1918) witnessed the maturation of the wartime correspondence, as well as the increasingly intertwined relationship between the state and the press. Initially, the Allied and Central Powers attempted to accommodate war correspondents by accrediting journalists and providing tours of the battlefields and military positions. However, as the war progressed, the governments of the Allies and the Central Powers reined in journalists by providing only the sort of information that was deemed suitable by the military censors. Propaganda was crucial in maintaining public support of the war. Casualties were downplayed, even fudged. Both the Allies and the Central Powers painted their respective causes in the most favorable light possible, while portraying the enemy as less than human. God was on everyone's side, and the war was described as a war for civilization. The British were especially adept in demonizing the Germans. The *Financial Times* reported on June 10, 1915, that the German army had put a bounty on the children of the Belgian king, Albert. The Bryce Commission reported alleged German atrocities committed in Belgium. Among them included accounts of rape, butchery, and murder. Because the report bore the name of Lord Bryce, a scholar and former ambassador to the United States, the atrocities gained credibility among the British and American public, arousing anti-German sentiment. A decade later, many of the allegations were proved to be exaggerated or false.

World War II (1939-1945) proved to be far more destructive than the first, and the ability of the government to control information was even greater because of advances in technology in the twenty years since the guns had fallen silent at the western front. In response to the development of shortwave radio, the

British Ministry of Information established protocols for the control of information in 1936; its objective was to make the next war a "newsless" war. Correspondents' movements would be restricted by the military. Censors would keep unflattering information away from the public view. The Germans took their cue from the example set by during British World War I, creating an elaborate propaganda machine directed by Joseph Goebbels (1897-1945). The military establishment carefully screened all material written by correspondents and intimidated anyone who wrote unfavorable news about the German war effort.

The United States also established measures to prevent the leaking of sensitive information. Despite its democratic institutions, the U.S. government resorted to propaganda as a means to bolster public morale. Such practices dated to the Creel Commission during World War I. During the World War II Pacific campaign, for example, General Douglas MacArthur's return to the Philippines was publicized with photographers and newsreel cameras. At the same time, however, the news of the Holocaust found a skeptical audience. Having been raised on the German atrocity stories of World War I—subsequently discredited—the Allied public assumed that stories of the concentration camps were mere propaganda. As in World War I, journalists during World War II were their own censors, glorifying their own countries at the expense of the truth.

After World War II, the Grand Alliance broke down into superpower tensions between the United States and the Soviet Union. The witch hunts of McCarthyism led Americans to fear the spread of communism throughout Eastern Europe and the Third World. Unlike World War II, in which the enemy was clearly established, wartime coverage of conflicts in Africa, Asia, and Latin America was ambiguous for journalists because of the nature of the client-state relationship of the Cold War. The Korean War (1950-1953) was such a war. Journalists found it difficult to understand the objectives of this conflict, which killed 2 million Koreans and 300,000 troops under the United Nations. Military censorship hampered journalists' ability to obtain facts, as in previous wars.

In the 1960's, technology revolutionized the dissemination of information as television and satellite communication brought the war to people's living rooms. The Vietnam War (1961-1975) was broadcast into the homes of Americans every evening. As the public watched, the reality of war—battles, casualties, maimed and dying children, and soldiers returned in body bags—mounted in the evening news.

Hulton ArchiveGetty Images

War correspondent Walter Cronkite reporting from Vietnam during the Tet Offensive in 1968.

American public opinion turned against the war, and for the next decade and a half the experience of the Vietnam War, for both soldiers and civilians, made the United States reluctant to engage in any major conflict.

With the end of the Cold War came new conflicts. The Persian Gulf War (1990-1991) marked a return of the United States to the field of war. Journalists once again were restricted by the military establishment and were fed information without the opportunity to investigate its veracity, though they were allowed to be present to report the impact of Saddam Hussein's bombs falling as the U.S. troops entered Kuwait. This was the first major conflict the United States had been involved with since the advent of twenty-four-hour cable news organizations, such as Cable News Network (CNN). Americans no longer had to wait for the evening news to know what was happening; now the newest developments were in front of the American public as they happened.

By the mid-1990's, the Internet was making the reporting of events even faster. This was clearly evident during the American invasion of Iraq in 2003, as journalists "embedded" in military units reported their stories instantaneously. With the advent of embedded journalism, the objectivity of the reporting came into question, as the idea of an embedded journalist reporting negatively on the actions of the unit with which he was traveling was unthinkable. Regardless of the changes on the battlefield, the conflict between the military and the public's right to know continues.

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Dino E. Buenviaje

Propaganda

Overview

Propaganda, simply put, is the manipulation of opinion. This, however, is the only thing simple about it. In its nuances and implications, propaganda's basic appearance belies its utter complexity. To begin with, the propagandist aims to communicate messages at the level of the emotions rather than thought. The more emotional the message is, the more successful the propaganda will be in persuading its audience. It is important to avoid logical thought; members of the target audience must become so enchanted with the message that they are seduced into a state of willing disbelief. Confusion and deception, rather than discussion and debate, rule the day for this subterfuge. Through the telling of partial truths and the omission of others, the propagandist attempts to shape perceptions, manipulate cognitions, and directly control the behavior of the intended audience.

While propaganda can be utilized by governments or groups to push forward social agendas or movements, it holds its most powerful potential in warfare. In warfare, propaganda often conveys a message concerning a real or imagined threat. Here propaganda is aimed at two targets: the nation's own citizens and the enemy.

Significance

Propaganda has taken as many different forms as there are societies in which it has been used. In its broadest sense, propaganda is information intended to persuade or orient its audience toward a certain way of thinking. Some examples are personal, such as the tattoo-covered Caddo warrior, whose body attests to every victory, accomplishment, or god worshiped. Some are thunderous, such as Hannibal's titanic war elephants advancing across the Italian plain. Some are deafening, such as the "rebel yells" of Confeder-

National Archives

A World War II poster reminds Americans never to reveal sensitive information to anyone, because "loose lips sink ships."

ate soldiers proclaiming that a charge was about to ensue. Some are subtle, such as the poster of a coquettish woman announcing that if she were a man she would join the U.S. Navy. Some are persistent, such as North Korean radio, announcing good morning from the Great Leader as the Sun peeks over the horizon. Some are selective, such as the media's decision to show jetliners colliding into the World Trade Center but not to show civilians leaping from windows and plummeting to their deaths. All of these examples of propaganda, while seemingly disparate, have a common purpose: They serve to rally a group of people around an image or to manipulate the morale of an common enemy. All are forms of propaganda.

Both the people of Imperial China and their enemies saw the power of the emperor in the Great Wall. Later, the great cathedrals that filled Europe were symbolic not only of the Christian godhead but also of the worldly power of the Roman Catholic Church and the Papacy. In the 1930's, during the worldwide Great Depression, different ideologies were displayed through building projects to demonstrate the supremacy of their causes. The Soviet Union built the world's largest fixed-wing aircraft, the Tupolev ANT-20; Nazi Germany built the world's largest airships, the Zeppelins; and at the same time, the German Volkswagen, or "people's car," crossed the Third Reich on the Autobahn. To buoy up the the capitalist democracy of America during the economic crisis, President Franklin D. Roosevelt spent on great public works projects, and the federal government subsidized artists who painted murals and actors who presented plays in the Art for the Millions program. Such projects not only put people to work; they reinforced the greatness of America in the minds of the nation's downtrodden citizens. For the Soviet Union, the hammer and sickle provided a strong image of plebeian empowerment. Nazi Germany took a Sanskrit symbol, the swastika, turned it at an angle, and made it the symbol of the National Socialist (Nazi) Party and "Aryan" purity. The United States adopted the bald eagle as the country's symbol: an image of fierce beauty and proud independence, flying above others and symbolizing what many consider great about America. Propagandists, in summary, work to remove all doubt about the superiority of a society by focusing that greatness into symbolic images.

History of Propaganda

Ancient World

In the ancient world, the success of a society depended on many things, but predominantly on the size of the population. One of the ways this was promoted was to persuade the people that they were somehow set apart. Historically, building the notion of the "greatness" or "moral superiority" of the group has been accomplished in many ways—from early tribal organizations that taught that the gods held their people in special favor to later civilizations in which the leaders themselves claimed some form of divine right. To doubt the group's moral superiority, therefore, was to doubt the gods, tantamount to a form a sacrilege. As civilizations advanced, architecture was used as a physical symbol to illustrate the greatness of the state.

Methods of communication enhanced the ability of civilizations to broadcast their superiority, especially the development of written forms. At first these symbols were limited to pictographs that recounted the greatness of the society. Early examples can be found in the prehistoric cave paintings at Lascaux, France, where a landscape filled with bounty was depicted. As language continued to develop into the written word, the fact that literacy was limited to the elites forced the propagandists to continue to rely heavily on representative (rather than abstract) symbols for expression. Although Ramses the Great was possibly the most famous of the Pharaohs for his building projects, by no means was he the only one to undertake projects to assure his greatness through the ages. Almost every Egyptian ruler had murals painted and reliefs sculpted depicting the favor of the gods upon their society. Edifices ranging from the brightly painted temple walls to the tall obelisks recounted the favor the gods showed the Pharaoh and, by extension, the people of Egypt. This form of propaganda was not limited to the civilizations of the

Mediterranean basin; symbols propounding greatness can also be found among other ancient peoples, from the triumphal arches of the Romans to the image-laden walls of Temple of Warriors at Chichén Itzá.

MEDIEVAL WORLD

The collapse of the Western Roman Empire marked the entry of Europe into the medieval age. With the breakdown of large-scale infrastructure in the West, a void was created that was filled by the increasing power of the Roman Catholic Church, the development of the feudal system, and the growth of aristocracy and monarchy. Each of these elements of society used some form of propaganda to justify its position of authority.

The Church built symbol-laden cathedrals, which—beyond their gargoyles, statuary, and ornate stained-glass windows—spoke to parishioners of God's grace and favor for his people. Feudal lords built impregnable fortifications both for the protection of their people and as tangible expressions of their greatness. These fortifications, with their tall, thick walls of stone surrounded by defensive moats, were designed to deter enemies who might attack not only physically but also psychologically, with their stark, daunting appearance. Armor slowly developed until it reached the pinnacle of defensive propaganda: the metal plate of the knight. Weapons, such as the crossbow, were developed that were so dangerous—and whose possession was so effective as a propaganda tool—that the Church attempted to outlaw them. Because building and supporting armies with the latest technologies took resources, the escalating need to "out-might" the enemy eventually led to the formation of centralized nation-states under the governance of monarchs. As strong governments reappeared, the focus could be expanded beyond merely survival and the modern age arrived.

During the late tenth through twelfth centuries the Crusades against the Islamic "infidels" of the Middle East and North Africa were promoted by the Roman Catholic popes as a struggle behooving all good Christians. Beginning with his speech at Clermont in 1095, for example, Pope Urban II used his power of the pulpit and graphic language (re-rendered here from the account of Robert the Monk, about twenty-five years later) to call on Christian soldiers to fight Muslims in the Levant who were killing Christians and destroying churches:

> When they [the infidels] wish to torture people by base death, they perforate their navels, and dragging forth the extremity of the intestines, bind it to the stake. . . . On whom therefore is the labor of avenging these wrongs and of recovering this territory incumbent, if not upon you? You, upon whom above other nations God has conferred remarkable glory in arms, great courage, bodily activity, and strength to humble the hairy scalp of those who resist you. . . .

What prompted this appeal was not only a call from Byzantine emperor Alexius I for defenses against Turkish incursions but also the (quite political) hope on the part of the Papacy to reunite Christendom after its schism in 1054, thus solidifying the power of the Church to achieve a theocracy over Western Europe, Eastern Europe, and the kingdom of Jerusalem. Not insignificant in this effort was the popes' fear of the increasing secular powers of feudal kings and their vassals. For all these reasons, Urban II preached a sermon that rivaled the intensity of the speeches of Adolf Hitler eight and a half centuries later. The frenzied audience responded, "Deus volt!" ("God wills it!").

Perhaps the most important tool of propaganda developed near the end of the Middle Ages, with the arrival of Johann Gutenberg's printing press in 1453. The ability to mass-produce printed documents quickly made possible the dissemination of the written word to a populace that formerly was not (and could not afford to be) literate. Like today's Internet, the printing press revolutionized—created, really—mass communications. Within a few decades, the number of books in Europe increased from thousands to millions and literacy was on the rise, increasing dramatically by the sixteenth century. In the meantime, one of the first uses of the printing press was during the religious upheavals known as the Protestant Reformation and the ensuing Counter-Reformation. The printing press made possible the dissemina-

tion of propaganda images to an illiterate population, often casting the pope, as the representative of the Roman Church, in a negative light. Lucas Cranach's *Whore of Babylon* and Albrecht Dürer's series of what would now be called political cartoons, *Passion of the Christ and Anti-Christ* (the anti-Christ being the pope), are examples. As literacy increased, bills, pamphlets, and other writings disseminated Protestant and Catholic propaganda messages to the mass populace. Perhaps the most important of these was the Ninety-five Theses of Martin Luther himself—widely considered to be the spur to the the Reformation.

MODERN WORLD

During the modern age, propaganda has become more vivid and widely used, as an ongoing revolution in communications media has allowed for the easier distribution of inflammatory imagery and messages. Should the government need its population to take action against a real or perceived threat, the focus of propaganda becomes the unquestioned supremacy of the group. Propaganda has continued to be used to dehumanize and incite hatred toward the enemy—an enemy that can be either external or internal (that is, anyone who stands against the ideal the propagandist supports). To this end, the propagandist manipulates the use of symbols. The enemy is reduced to a malicious, dehumanized caricature.

Some groups used these tactics simply to put forth their agendas. The Grangers (later the Farmer's Alliance), for example, promulgated images of the fat eastern capitalist draining the wealth of the hard-working western farmers. Immigrants were often caricatured by xenophobic nativist (anti-immigrant) Americans as evil-looking beasts; the Irish in the mid-nineteenth century, the Chinese during the late nineteenth century, and Mexican Americans in the early to mid-twentieth century are among these groups. Both Native Americans and African Americans have been the victims of such propaganda from the arrival of Europeans in North America, suffering the double atrocities of oppression and slavery as well as hatred incited by propaganda. Today, some might even consider the portrayal of a greedy, uncaring tobacco industry as nothing more than a type of propaganda that paints the "enemy" with a broad brush as merchants of death.

Combining language with imagery and symbols has allowed propagandists to increase their effectiveness. As a greater percentage of the population became literate, the power of words was used to advance propagandists' positions. For propagandists, the message was best kept simple and short. Like visual forms of propaganda, the words had to be clear, concise, and repeated—hammering home the same emotional message. With the advance of technology, the modern propagandist had a wide assortment of rhetorical tools on which to draw to persuade the people, from transparent appeals to fear, prejudice, or groundless personal attacks to subtler messages that associate positive imagery with behaviors the propagandist wishes to promote or negative imagery with groups the propagandist wishes to demonize.

An excellent example of how a small minority used the power of language, stereotype, frustration, and fear to further its message can be seen in the reporting of the 1770 Boston Massacre. After the conclusion of the French and Indian War (1763), the American colonists were frustrated by Britain's imposition of new taxes, increased regulation, and insufficient government services, which were seen as threats to the prosperity the colonials had enjoyed. However, with no unity among the colonies, this displeasure was too diffuse to find effective expression. On March 4, 1770, British soldiers, in self-defense, fired on an agitated mob of more than four hundred American colonists in Boston, Massachusetts. When the smoke cleared, five bodies lay dead. Samuel Adams, leader of Boston's Sons of Liberty, knew that this incident was "propaganda gold." Adams pursued many avenues to turn an action of civil disobedience into martyrdom. First, he gave this incident a name: the Boston Massacre. Turning to fellow Son of Liberty and well-known silversmith Paul Revere, he commissioned Revere to create a lithograph, an image that depicted an image the propagandists wanted to reinforce in the minds of the colonists. The British soldiers were reduced to mere caricatures: faces frozen in devilish grins, firing on command into innocent townspeople. One of the civilian targets was

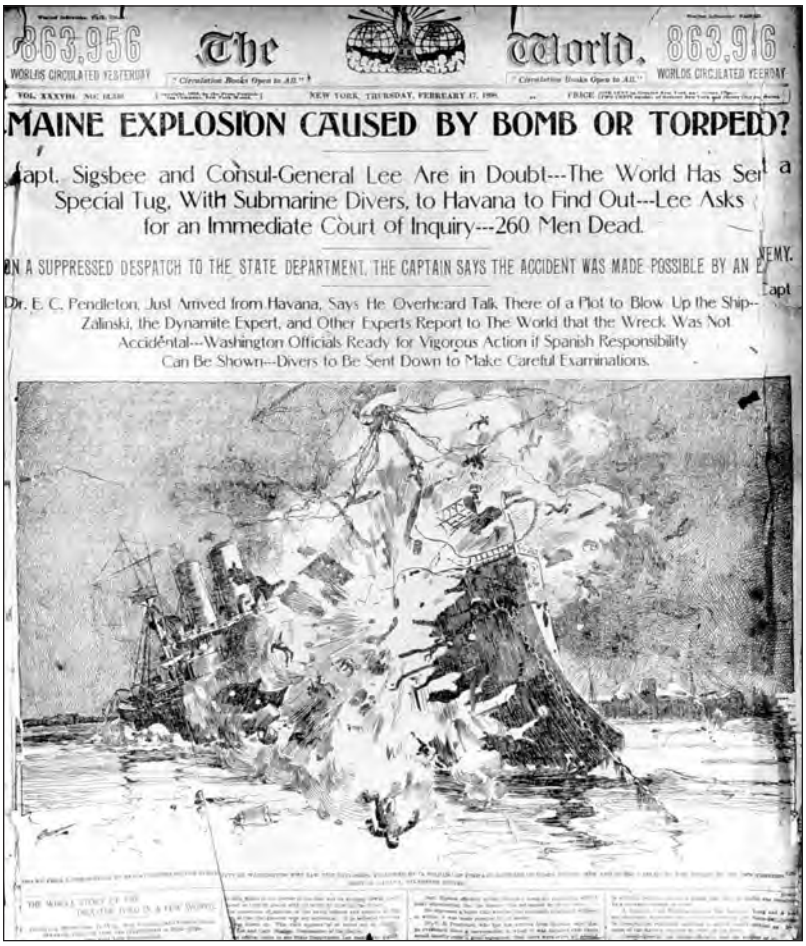
depicted as innocently walking his dog. (It is noteworthy that, although Crispus Attucks, a mixed African and Native American, was one of the first to die, all victims portrayed were white.) Despite the fact that the event took place at night, the picture painted it as occurring during the day. Despite, or perhaps because of, such inaccuracies, this piece of propaganda was very effective. The colonies unified, and the tax was repealed. Through "committees of correspondence," news and suspicions surrounding the British continued to flow through the colonies. In 1773, when the British passed the Tea Act to save their struggling East India Company, the colonial reaction was immediate and intense. Although the new law actually would have made tea cheaper, the propagandists were able to paint it as a devious trick by the British to force the colonists to pay one more duty. The conversion of the colonials to the revolutionaries' cause was so effective that anger and riots in some areas took place against attempted landings of the new and cheaper tea, culminating in the famous Boston Tea Party of December, 1773.

R. S. Peale and J. A. Hill

Paul Revere's engraving of the Boston Massacre of 1770.

Through the utilization of words and imagery, newspaper magnate William Randolph Hearst helped foment the 1898 Spanish-American War by carrying sensational stories of Spanish atrocities against the Cuban people. Such stories, combined with imagery and music, prepared the American people for the reality of war. Hearst's papers, it has been argued, issued so many fabricated or at least exaggerated stories of atrocities in Cuba that his "yellow journalism" can be seen as manufacturing the rationale for a war of imperialism on the part of the United States. When Hearst sent illustrator Frederic Remington to Cuba to record mutilations and other horrors perpetrated by the Spanish, Remington sent Hearst a telegram: "Everything is quiet. There is no trouble here. There will be no war." Hearst's now famous reply was immediate and unequivocal: "Please remain. You furnish the pictures and I'll furnish the war." When Hearst's newspapers carried the story of the explosion on the USS *Maine* in Havana harbor on February 15, 1898, an enhanced color lithograph accompanied the text, along with a jingoistic headline, "Remember the *Maine*!" So powerful was this report that, despite the fact that the President William McKinley was hesitant, a declaration of war sailed through Congress.

World Wars I and II offer some of the most famous instances of propaganda, on both sides. During World War I, the Creel Commission in the United States, for example, propagated the characterization of Germans as "vile Huns." In the years leading up to World War II, Jews and other ethnic groups were made scapegoats for every imaginable wrong suffered by the German people. The Nazi regime, headed by Adolf Hitler, found a populace willing to be persuaded, under the direction of propaganda minister Joseph Goebbels, that whole ethnic populations were unfit to live and that Germans who could consider



863,956 The World. 863,916
WORLDS CIRCULATED YESTERDAY WORLDS CIRCULATED YESTERDAY

MAINE EXPLOSION CAUSED BY BOMB OR TORPEDO?

Capt. Sigsbee and Consul-General Lee Are in Doubt---The World Has Sent a Special Tug, With Submarine Divers, to Havana to Find Out---Lee Asks for an Immediate Court of Inquiry---260 Men Dead.

IN A SUPPRESSED DESPATCH TO THE STATE DEPARTMENT, THE CAPTAIN SAYS THE ACCIDENT WAS MADE POSSIBLE BY AN ENEMY.

Dr. E. C. Pendleton, Just Arrived from Havana, Says He Overheard Talk There of a Plot to Blow Up the Ship---Zalinski, the Dynamite Expert, and Other Experts Report to The World that the Wreck Was Not Accidental---Washington Officials Ready for Vigorous Action if Spanish Responsibility Can Be Shown---Divers to Be Sent Down to Make Careful Examinations.

Library of Congress

The New York World *two days after the USS* Maine *exploded in Havana harbor.*

themselves part of the pure "Aryan" race were destined to rule the world. As a result, the deaths of six million Jews and approximately one million others were blinked at by a brainwashed citizenry.

Propaganda became global during the Cold War (1945-1991). The propaganda produced during the second half of the twentieth century, a period of brinkmanship and détente, was nationalistic and ideological. The governments of both the United States and the Soviet Union employed any and every media outlet they could to reinforce, remind, and ultimately convert other nations to their point of view. The United States Information Agency was created to spread its message of freedom. Utilizing such outlets as the Voice of America, Radio Free Europe, and Radio Liberty, the U.S. government broadcast messages crafted to entertain, inform, and, of course, warn against the dangerously aggressive Soviet Union, portraying it as a system that sought to brainwash citizens in any territory it acquired. The Soviet Union, for its part, happily used the image of the fearless juggernaut the West provided, employing Radio Moscow to broadcast its own messages that the West was a place of moral decadence whose governments were dominated by greedy capitalists who exploited the citizenry, leaving them to live in conflict and poverty.

In the so-called War on Terror (following the attacks on the Pentagon and World Trade Center on September 11, 2001), propaganda continued to be employed. This global conflict, however, has produced an interesting form of propaganda, almost a sterile "anti-propaganda." If propaganda is the manipulation of facts, it is interesting to note what facts are presented to the American people. With an almost sanitized coverage of the war over much of the media, many Americans have enjoyed a comfortable mental separation from the conflict (unlike what they experienced during the Vietnam War [1961-1975], when images of battle and carnage could be seen daily on their television sets and the draft threatened sons, brothers, and boyfriends). Moreover, Americans were asked to sacrifice nothing as the War on Terror began in 2003: Soldiers were not drafted; food and personal items were not rationed. Likewise, caricatures of zealous terrorists have not been presented. At times it seems as though the only propaganda use of the conflict occurs when a political party sees an opportunity to further its agenda. Once pulled out of the box, however, the War on Terror and its attendant conflicts have just as

quickly been stuffed back inside: to be forgotten or dropped. The media, perceiving the citizenry's lack of appetite for coverage of seemingly endless and goal-less conflict, after the initial years have tended to report on the war with the same emphasis they give to the death of a pop musician, using the events to fill gaps in the twenty-four-hour news cycle. With no casualties seen or advancements toward a clear victory heralded, it seems as if this lack of coverage may be a new, postmodern form of propaganda by omission.

In the twenty-first century, the proliferation of information transmitted by handheld communication devices—such as "smart" cell phones equipped with still and video cameras whose images are easily uploaded to Web sites on the Internet such as YouTube—vies with editorially vetted sources of information such as established news agencies. The speed with which information, confirmed or unconfirmed, is globally transmitted both facilitates and complicates the propagandist's purpose. What is clear is that information must be consumed responsibly, and dispassionately, if the peoples of the world are to perceive, and protect themselves from, the intention behind the message.

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Andrew Reynolds Galloway and Steven L. Danver

Revolt, Rebellion, and Insurgency

Overview

The legal framework of war may be the only place where a serious and spirited debate over the differences between revolt, rebellion, and insurgency can occur. However, for those who happen to be leading a revolt, planning a rebellion, or participating in an insurgency, the subtle distinctions between the three can be important. A revolt is defined as an attempt to break away from or rise against established authority. Rebellion goes further, suggesting the manner and extent to which that person will resist those government demands. Insurgency is that state of resistance which, while clearly a challenge to established order, lacks the organizational aspects of a revolution. History is full of examples of all three.

Significance

While it would be easy to dismiss revolt, rebellion, and insurgency as events cut from the same cloth, there is a slight, but nonetheless important, distinction. Only insurgency would seem to offer any outside credibility, which might entitle it not only legal recognition from other nations but also material support, and quite possibly legal protection in the event of failure. If one is facing a well-entrenched opposition and the odds of success appear slim, being able to win acceptance as an insurgent movement could offer some very important perquisties, including the chance of avoiding execution in the event of failure.

History of Revolt, Rebellion, and Insurgency

Ancient World

No doubt Roman leaders in charge of the security of their empire spent more than one sleepless night worried about the Middle East, and with good reason. The Great Revolt, also known as the First Jewish-Roman War, lasted seven years and, while a failure, revealed the obstacles an occupying force faced in trying to pacify an area. Starting in the year 66 C.E., over alleged religious tensions between Jews and Greeks, it quickly grew to include an antitax protest and even featured random attacks on Roman citizens in Caesarea. Roman troops were rushed in to restore order but were attacked and turned back by local forces. Fearing the defeat might embolden others to join the revolt, Emperor Nero ordered a full-scale invasion to crush it. In 67 C.E., 60,000 Roman troops attacked Galilee, and its destruction convinced many that resistance was futile. Year by year, town by town, the Roman legions restored order, until the only remaining holdout was Masada, to which the Romans laid siege (70-73 C.E.). When the legions finally broke through the fortresses' defenses, they found that the defenders had taken their own lives rather than surrender. Masada's fall signaled that the revolt was over, crushed by overwhelming force and quite possibly hampered by its inability to win new supporters or outside help.

Medieval World

Runnymede may seem like a strange name to some people, but to others it is the home of one of the most significant rebellions of the medieval world. It was at Runnymede in England that the people of Britain successfully forced their king to acknowledge that the rule of law surpassed his power as monarch.

In 1066, the Normans had conquered England and in the process established a highly centralized form of government that put tremendous power in the hands of the king. The system seemed to work until the early thirteenth century, when John of England became king. He suffered a series of military setbacks, which cost him valuable lands in France and required him to raise taxes to mount a counterattack. He also ran afoul of the Catholic Church over the

selection of the Archbishop of Canterbury. It had always been the king's choice, but bishops decided they wanted more of a say. The controversy resulted in King John's excommunication by Pope Innocent III and the threat of an invasion by Spain. The bishops got their choice, and John returned to the good graces of Rome by declaring England and Ireland papal territories and then renting them back for an annual tribute. Noblemen, worried about how the higher taxes might affect their holdings and enraged by the king's unilateral surrender of sovereignty to a foreign power, may have been pushed over the edge and into rebellion. In 1215 they gathered their forces and marched on London, finding the gates open to them and a receptive population waiting for them. Many of the city's residents, though not in outright rebellion, shared the nobles' outrage concerning the king's behavior. Together this coalition executed by all accounts a relatively peaceful rebellion, forcing King John to meet them, acknowledge certain limits to his power (in the Magna Carta), and grant the nobles certain control over his actions.

MODERN WORLD

The Arab Revolt of 1936-1939 is a good example of a revolt that failed to achieve its goals. It was a revolt by committee, trying to forge a coalition among groups without giving much thought or shedding much light on what it would do if successful.

Britain had controlled the area in the Middle East known as Palestine since the end of World War I, alternately administering and disciplining Palestinian Arabs and Jews. The Balfour Declaration (1917) had determined that at some point the region was to be designated a homeland for Jews, with some consideration given to the national aspirations of Arabs. Both sides wanted a homeland that excluded the other. The Arab Revolt of 1936-1939 was the first sustained violent uprising of Palestinian Arabs in more than a century. Thousands of Arabs from all classes were mobilized. The revolt began with spontaneous acts of violence committed by followers of an Arab religious leader who had been killed by the British in 1935. In April, 1936, the murder of two Jews led to escalating violence. At that point, Arab political parties formed a committee. It called for a general strike, nonpayment of taxes, and national independence. Coinciding with the strike, Arab rebels, joined by volunteers from neighboring Arab countries, took to the hills, attacking Jewish settlements and British installations in the northern part of the country. By the end of the year, the movement had assumed the dimensions of a national revolt. The British shipped more than twenty thousand troops into Palestine, and by 1939 the Zionists had armed more than fifteen thousand of its people in their own nationalist movement. Even though the arrival of British troops restored some semblance of order, the armed revolt continued. A British government task force was sent to Palestine to investigate the situation and reported in July, 1937, that the revolt was caused by an Arab desire for independence. The task force recommended that the region be partitioned, separating Jews from Arabs, and further recommended the forcible transfer of the Arab population from the pro-

F. R. Niglutsch

Revolutionaries defending barricades in Paris during the July, 1830, revolution.

posed Jewish state. The Arabs were horrified by the idea of dismembering the region and particularly by the suggestion that they be forcibly transferred. As a result, the momentum of the revolt increased. In September, 1937, the British were forced to declare martial law, and many Arab officials were arrested. Although the Arab Revolt continued well into 1939, high casualty rates and firm British measures gradually eroded its strength. According to some estimates, more than five thousand Arabs were killed, fifteen thousand wounded, and fifty-six hundred imprisoned.

Although it signified the birth of a national identity, the revolt was unsuccessful in many ways. The general strike, which was called off in October, 1939, had encouraged Palestinian Jews to become more self-reliant, and the Arabs of Palestine were unable to recover from their sustained effort of defying the British administration. Their leaders were killed, arrested, or deported, leaving the dispirited and disarmed population divided. Palestinian Jews, on the other hand, were united and cooperated with British forces in fighting the Arabs. In the end the revolt failed because of a leadership vacuum and inability to articulate a vision for a political structure to supplant the British authority.

If revolts are the poor relations of forceful change, rebellion may be their more successful cousins, but just barely. Like revolts, rebellions involve open defiance of the established order. Rebellion, however, also involves a clear use of armed force and attempts to publicize its objectives so people know what the ruckus is all about.

The Chechen Rebellion in Russia is a good example. Chechnya declared its independence in 1991 as the Soviet Union was collapsing. However, it was unable to free itself from the Russian Federation, led by Boris Yeltsin. The First Chechen War lasted from 1994 to 1996, when Russian forces attempted to stop Chechnya from seceding. The Russians outmanned and outgunned the Chechen rebels but could not outmaneuver them, and they were therefore unable to smash the resistance. In 1996 the Russian government signed a peace treaty with Chechnya's military leaders, who proclaimed the rebellion a success. The Chechen people elected a president and a coalition government and went about the business of running their own country. The independence was short-lived, however, apparently faltering when Chechens decided to export their rebellious notions to neighboring Dagestan. This time the Russians responded in a more organized fashion, coordinating air and ground operations first to eject the Chechens from Dagestan and then to invade Chechnya itself. The Russian incursion disrupted Chechnya's rebel movement and claimed the life of its president. By 2000, Russia had installed a pro-Moscow government in Chechnya, ending the rebel movement indefinitely.

In the eyes of the world—or at least in the eyes of those who recognize international law—insurgency may be the most legitimate form of resistance to an existing order. To engage in insurgency is to participate in a revolt against a government in a manner less organized than a revolution. Revolutions are more cerebral; they leave paper trails of those who have spoken of them, written about them, and even planned them. Insurgencies are more action-oriented, headed by leaders sometimes characterized by dedication, swagger, and daring and pitted against seemingly overwhelming odds. Fidel Castro and his insurgent forces in Cuba or Ho Chi Minh and his insurgent forces in Vietnam might come to mind. In the beginning, neither Castro nor Ho and his forces were able to control large areas of territory, but they certainly were capable of offering stiff resistance to the Cuban and French governments, respectively.

The question of how insurgents should be dealt with in the event of their success (or failure) is at issue: Recognition by third parties? Summary execution? At the very least, international law has instructed its adherents that insurgencies can be recognized as wars against the established order. At the same time, recognition of an insurgency expresses the belief by third parties that the insurgents should not be executed if captured and that they should be entitled to prevent the opposition from gaining access to supplies from neutral nations. In their insurgency against the French, Ho Chi Minh and his followers enjoyed the support of the Soviet Union and the People's Republic of China, and they diligently

attempted to deny France the supplies it received from a seemingly neutral party, the United States. In the end the insurgency prevailed, and Ho went on to bigger things.

In the tangled maze of revolts, rebellions, and insurgencies, with their confusing mix of terms, one thing seems clear: It is how others see them that really counts.

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John Morello

War's Impact on Economies

Overview

Although most histories focus on the battles that accompany wars, few address the economic impact those conflicts have on the societies involved or the neutral parties connected to them. Land produced most human "wealth" before the twentieth century, but cities and towns have been the centers of commerce, grain stores, and treasury as well as political power. Destroying or consuming crops imposed hardship on a population, but sacking cities reduced a civilization's financial reserves, all but eliminating its ability to recover. Disease, starvation, and the mass removal of population as slaves followed, intensifying the damage. Civil wars have proven particularly devastating for the loser.

Significance

A conflict's impact on the participants' economies often has lasting effects beyond the conflict itself. Wars that endured with no particular victor exhausted the participants, leaving them too weak to withstand an outside power—or the economic price and deprivation imposed on the population led to the destruction of the established political order, even in cases where no conquering army occupied the land. China's and Europe's dynastic collapses illustrate the political upheaval created by war's economic and corresponding political impact, as does the post-World War II breakup of Europe's colonial empires.

History of War's Impact on Economies

Ancient World

In ancient times, war's primary economic impact fell on the invaded territory. The Egyptian, Sumerian city-state, Hittite, Assyrian, and Persian armies plundered the areas they invaded, making exceptions when cities opened their gates without resistance. However, while marching through their own territories, these armies drew from imperial grain stores or, in the case of Egyptian troops, were supported by grain ships. Nonetheless, the armies' supplies came at the expense of the civilian population.

In their wars against each other, Greek city-state armies lived off the land when they marched into hostile territory but rarely sacked cities except as punishment. Chinese armies also lived off the land, but the sacking of cities was rare after the Warring States period of the third to fourth centuries B.C.E. Most Chinese conquerors were as concerned with governing the territory they seized as they were with taking it in the first place. They deployed with a supply train that provided at least some of their food supplies, reducing their reliance on local resources. South Asian, Southeast Asian, and Japanese armies relied almost entirely on local food supplies as they marched. Although the extent of the economic damage varied according to army size and the duration of a campaign, few regions recovered quickly from the passage of any army, friendly or hostile, but the latter left a path of ruin from which it took years to recover.

The Imperial Roman Army was the first European army to rely heavily on a military supply system, but early Roman armies followed the practices of other European militaries, living off the land most of the time. However, the development of a disciplined army quartermaster system limited the army's reliance on local supplies, reducing frictions with potentially allied city-states. Before that, Rome's wars on Carthage first destroyed that commercial empire's navy and merchant marine, severely disrupting its trade and financial power. The Second Punic War (218-201 B.C.E.) devastated both Rome's and Carthage's economies, but Rome's naval supremacy enabled it to continue its foreign commerce, denying Carthage the resources and ability to support Hannibal's campaign on the Italian peninsula. Moreover,

Rome's superior diplomacy prevented Hannibal from drawing more than a handful of Italian city-states to his side. He eventually was forced to return home, but the devastation he inflicted on Rome's economy drove the Senate to seek Carthage's permanent removal as a threat. The resulting Third Punic War (149-146 B.C.E.) ended with Rome salting the fields around Carthage, sacking the city, and thereby permanently destroying its capacity for trade and war.

Rome's expansion after that came at the expense of conquered lands, as plunder and populations sold into slavery fed Rome's coffers. Captured wealth peaked in the first century after Julius Caesar's death, but as Rome's borders stabilized and conquest gave way to consolidation, the absence of seized riches began to tell on the Roman treasury, a factor exacerbated by the empire's numerous civil wars, which disrupted internal trade and destroyed farmland. The barbarian invasions further decimated Rome's agricultural and mineral production. The exact cost may never be calculated with certainty, but descriptions of the looting, destruction, and casualties suggest the barbarian incursions cost Rome more than 25 percent, and possibly as much as 40 percent, of its productive capacity between the third and fifth century C.E. The same can be said for the Eastern Empire, which survived Rome's fall, leaving Byzantium in a constant state of constrained finances despite its later monopoly on the European silk trade.

MEDIEVAL WORLD

While the "Dark Ages" followed Rome's demise at the end of the fifth century, Asia saw extensive trade and wealth, with India and China each producing roughly 23-25 percent of global economic activity into the twelfth century. The Islamic armies' sweep across North Africa and the Holy Land destroyed the traditional Afro-European trading patterns in the seventh and eighth centuries and that between Europe and the Middle East during the late eleventh century. The Mongol and Muslim invasions also disrupted trade between Europe and Asia during that century, and the Mongols all but destroyed the trading empires of central Asia. They wiped out entire city populations and laid waste to the countryside around enemy cities as a terror tactic. Although the Crusades initially were called to help the Eastern Roman Empire retake the Holy Land from Islam, the First Crusade's looting and other excesses perpetrated on the march through Byzantine territory severely damaged Byzantium's wealth and agricultural production, significantly reducing the empire's economic base. The Eastern Empire never fully recovered from the seizure of the capital and looting of the treasury during the Fourth Crusade (1202-1204). Forced to grant tax concessions to Genoa and Venice and sell the rights to its silk monopoly, Byzantium, or Constantinople as it was known after the fifth century, was but an empty shell when the Ottoman Turks conquered the empire's remnants in 1453. However, the Crusades also opened European eyes to the culture, trade, and knowledge of the East, and that renewed knowledge led to the Renaissance that ultimately drove Europe's technological and industrial development in later centuries and, eventually, leadership over global affairs.

MODERN WORLD

The modern era began with the Thirty Years' War, which killed more than one-third of Germany's population, all but eliminated central Europe's commerce, and by some estimates consumed nearly half of northern Europe's production between 1618 and 1648. The human and economic costs influenced European, especially German and Austrian, thinking well into the nineteenth century. The period was marked by limited wars in which armies depended on stored supplies, paid for the materials they acquired from local communities, and relied on maneuver, rather than highly destructive and expensive combat, for victory.

That period of European warfare lasted until Napoleon reintroduced the concept of total war to Europe in the late eighteenth century. Napoleon's use of mass conscript armies living off the land and employment of concentrated artillery devastated the countryside of his opponents. His methods proved his undoing in Russia, where the czarist armies employed scorched-earth tactics to deny Napoleon food supplies and shelter for his troops, but the Russian victory came at the expense of starving its own population. More than one million Russians may have

died from hunger and disease following the French invasion, and Russian agricultural production did not return to prewar levels until five years later.

In Asia, European incursions and China's civil wars destroyed what once was the world's richest economy and empire. Most economists believe that China produced more than 25 percent of the world's gross domestic product (GDP) in 1700. The depredations of the Opium Wars (1839-1842, 1856-1860), nine rebellions, and the First Sino-Japanese War (1894-1895) had reduced China's economy and power to a fraction of its former self by the nineteenth century's end. Those conflicts, along with Europe and America's Industrial Revolution and domination of global trade, had reduced China's proportion of global economic output to less than 10 percent of the total. China's post-World War I civil war, World War II, and Maoist economic policies further decimated the country's economy. Meanwhile, the West's pursuit of weapons technology and national mobilization would set the stage for the most expensive conflicts in history.

America's Civil War (1861-1865) served as a harbinger: Both sides mobilized and committed their manpower as best their economies and political structures could support. The Northern armies destroyed millions of acres of cropland, the South's limited industrial capacity, and its transportation system, while the Union blockade all but terminated Southern trade with the outside world. The South's agriculture-based economy collapsed months before its armies, and it took more than eighty years for the region to regain its prewar standards of living and economic production.

World Wars I and II were industrial wars in which entire populations sacrificed to maintain their countries' or empires' war efforts. Those wars consumed more than 40 percent of the participating countries' economies and destroyed most of Central Europe's productive cropland. Food shortages swept across Europe throughout World War I and after the war, because farmhands were conscripted into service in the belief that larger armies would ensure a short war. Additionally, the destruction of Eastern Europe's farmland and diversion of fertilizer nitrates to production of explosives cut agricultural production by 40 percent. The war's cost drove all the participants into near bankruptcy. All of Europe's major empires fell as their entire societies collapsed from the weight of supporting those war efforts, giving rise to several revolutionary movements across the globe. Japan and neutral America gained from the participants' need for their loans, industrial production, and raw materials. Shielded by distance from joining the costly fighting in Europe, Japan acquired territories in China and the Western Pacific, gained further access to new military technologies, expanded its merchant marine to handle the escalating trade in war materials, and expanded its shipyards to meet French and British shipbuilding requirements. Although the United States did not gain any territory, its neutrality in the war's early years enabled it to transition from a debtor to a creditor nation. By the time America entered the war in 1917, France, Britain, and Russia owed the United States more than $16 billion, equal to about 15 percent of America's gross domestic product.

World War II proved even more expensive and destructive. The massive bombing of that war, Russia's scorched-earth policies, and German looting of its occupied territories destroyed more than 70 percent of Europe's total industrial capacity. Spared invasion and bombing, the United States was the only country to end the war with a larger industrial capacity than it had at war's start. Germany and Japan lost more than 90 percent of their industrial capacity and Russia more than 50 percent. Britain's economy shrank nearly 16 percent during the war, and its war debt approached 50 percent of GDP. By war's end, France's transportation networks were all but destroyed, particularly in the north, and would take a decade to rebuild. The same could be said for Germany's, Japan's, and Russia's. Italy's limited prewar industrial base suffered some damage but largely was spared by the country's September, 1943, surrender, which came before the Allied bombing campaign reached fruition. In fact, more than half of the world's total economic output was either destroyed or expended in World War II.

Except for civil wars, the conflicts that followed World War II have been more limited, but the growing cost of armaments has ensured that war's cost re-

mains high. More important, today the world's poorest nations (such as the Democratic Republic of the Congo, Eritrea, Somalia, and North Korea) are those that have been afflicted by conflict or have allocated excessive resources to readiness for war. The Arab-Israeli wars have suppressed economic growth among all the participants, and only extensive foreign aid and other forms of outside funding have kept them from bankruptcy. High oil prices have enabled the Arab nations to draw almost unlimited credit and provide funding to the so-called frontline states facing Israel. Coming at a time when the United States was addressing its social inequities, the Vietnam War (1961-1975) imposed an expanding deficit on the United States and destroyed South Vietnam's economy. North Vietnam reportedly expended nearly 40 percent of its GDP on the war and sustained that effort only with support from the Soviet Union, Warsaw Pact nations, and China.

However, the costliest wars of the twentieth century's second half were the incessant civil wars that plagued Africa. The nearly twenty years of fighting that afflicted Angola, the Democratic Republic of the Congo (DRC), the Côte d'Ivoire (Ivory Coast), Liberia, Rwanda, and Somalia have cost more than 5 million lives and may have deprived those countries of the equivalent of fifty years of GDP. Somalia remains a failed state. Angola's oil revenues have funded the de-mining and reconstruction efforts that may enable it to recover by 2015, but of the others, only Rwanda and Liberia remain completely at peace and are making progress toward recovery.

Elsewhere, Afghanistan's and Iraq's economies have been all but crippled by constant conflict since 1979, and only the latter's potential for expanded oil production offers the promise of fully funded recovery before 2020.

All indications suggest that the incessant local conflicts across the globe will continue to drain global resources well into the 2010's. The probability of massive nuclear war may have receded since the Cold War ended in 1991, but national and domestic rivalries and irredentist movements promise to sustain the world's level of conflict into the foreseeable future. For example, Pakistan's economy remains severely depressed by its enduring conflicts with domestic extremist elements and the government's concurrent and enduring focus on potential conflict with India. Pakistan will remain dependent on foreign aid and credit until both those issues are resolved. Afghanistan's internal conflicts cost about $35 billion a year, and the country requires more than $70 billion in assistance to repair the damage inflicted by thirty years (and counting) of nearly constant warfare within its borders. India, the Philippines, and Thailand face continuing separatist movements, some religious-based and other ideological, costing them up to 25 percent of their defensive budgets or about 3 percent of their GDPs. Terrorism in all of its forms reportedly has forced governments and organizations around the world to spend more than $200 billion on security alone and up to another $100 billion in military and security operations against terrorist groups and movements. Barring a sudden and rapid end to those movements, the price and economic impact probably will continue to rise.

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Carl Otis Schuster

Women, Children, and War

Overview

Since ancient times, although men have predominated in leading and fighting in wars, women and children have been involved as well. Women have participated in war as leaders and combatants. They have formulated strategies and have supported militaries by providing services as scavengers, cooks, seamstresses, laundresses, informants, vendors, prostitutes, clerks, nurses and doctors, technicians, pilots, and morale boosters, among other roles. They have been casualties of war, suffering abduction, sexual assault, injury, and death. Children, even the very young, have accompanied armies, have served in support roles and as soldiers, and have been bounty and victims of war.

In studying wars and children, it is necessary to keep in mind that the definition of what constituted a "child" as distinct from an "adult" has differed across cultures and over time. The 1989 United Nations Convention on the Rights of the Child defined a "child" as "below the age of eighteen years unless under the law applicable to the child, majority is attained earlier."

Significance

Portrayals of men in historical and recent accounts as the principal actors in war have tended to minimize women's and children's participation. With few exceptions, women and children have appeared in depictions of war primarily as relatives who remained at home when male soldiers departed for combat, and as victims of war atrocities, subjected to capture, rape, and murder. Influenced by women's movements in the latter half of the twentieth century and efforts by scholars to uncover the histories of and give voice to groups that previously received little attention, scholarship published in the late twentieth and early twenty-first centuries has broadened the scope of women's and children's involvement in wars beyond the roles of exceptional women and child leaders and warriors, families left behind when armies go on campaign, and victims of war. While such accounts recognize war in most societies over the ages as a predominantly masculine activity, largely entailing combat between adult males, they demonstrate that wars have relied heavily on women and children for justification, services, and morale. Such studies increase the understanding of why and how wars are waged, and of the effects of war beyond official combatants.

National Archives

A young boy learns about how to use a ration book during World War II.

History of Women, Children, and War

Ancient World

Ancient writings and artifacts provide evidence of women and children accompanying militaries and being involved in wars. However, the scarcity of written records, embellishments and other alterations in later accounts, and the challenges of analyzing archaeological objects can make it difficult to determine women's and children's activities with certainty. For example, the Egyptian queen Hatshepsut (c. 1503-1458 B.C.E.), who also ruled as a king and coregent with her stepson, might have led a military campaign to Nubia (now Sudan), but this remains speculation, even in the light of recently discovered evidence. Chinese writings and artifacts tell of women soldiers and military leaders, among them the general Fu Hao (c. 1200 B.C.E.) and Wei Hua Hu (also known as Hua Mulan, c. third century C.E.). Greek and Roman historians wrote of legendary events, passed down from oral accounts, said to have occurred centuries before they were transcribed. The Greek historian Herodotus (fifth century B.C.E.) wrote of Sammu-ramat, queen mother of Neo-Assyria in the ninth century B.C.E., conducting military campaigns against Babylonia and India. Modern scholarship, however, asserts that it is not possible to verify reports of Sammu-ramat's military exploits and notes that she and other Neo-Assyrian queens wielded power only through male relatives.

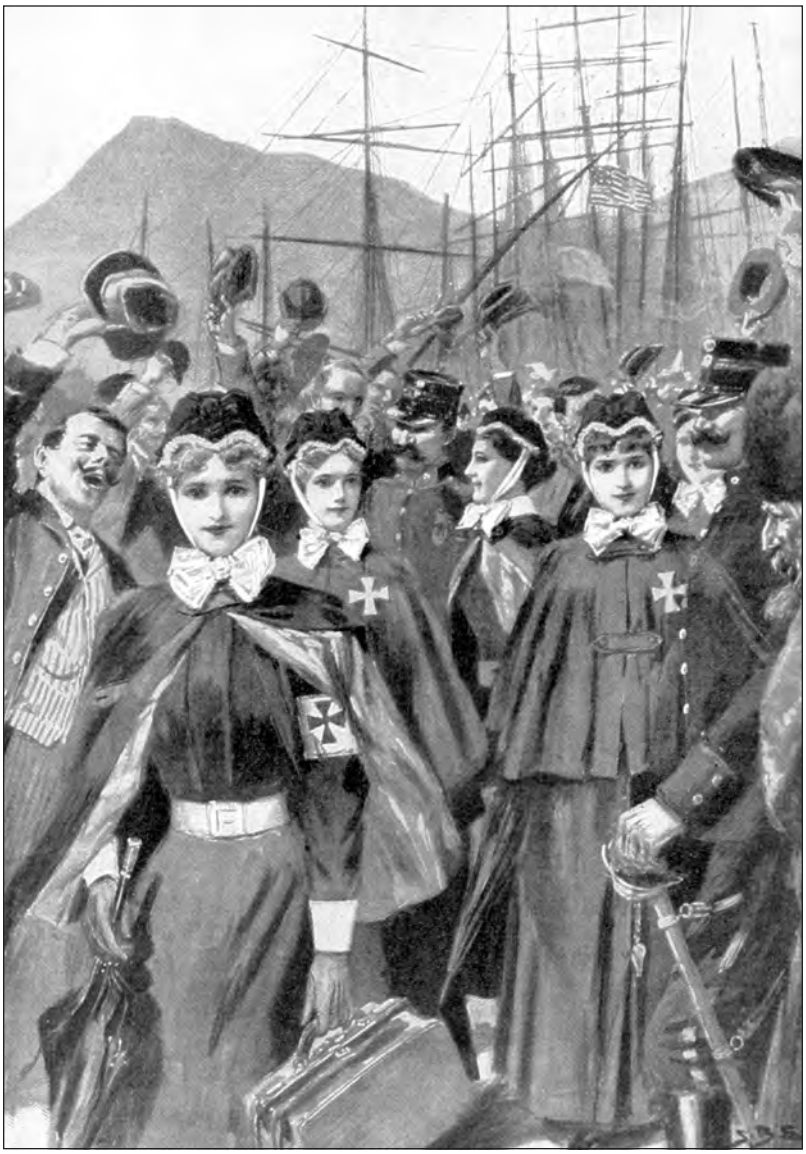
The Old Testament contains numerous stories of women and children's involvement in wars, as collaborators with male enemies, plunder, defenders, and fighters. One story is that after attacking the Midianites, the Israelite leader and prophet Moses (c. 1250 B.C.E.) allowed soldiers to keep thousands of virgin girls as spoils of war but ordered all boys and women to be killed. A famous biblical story is that of Deborah (twelfth century B.C.E.), an Israelite judge, prophet, and military leader who helped to plan and conduct an attack against the Canaanites. One must bear in mind that the historical authenticity of biblical figures and events often has been difficult to ascertain. That said, biblical accounts can offer insight into how earlier peoples conceived of roles of, as well as restrictions on, women and children in warfare.

Near-contemporaneous Greek and Roman writers left accounts of women's and children's involvement in wars and relationships with soldiers. Scholars in later ages have used these writings as well as other evidence in their studies of this topic. Ancient Greeks told of women warriors and of women defending their towns when attacked by outside armies. Roman officers could marry and were allowed to bring families to forts, archaeological evidence for which exists, for example, from the Vetera I fort in the Lower Rhine region (c. first century C.E.). It was not until c. 197 C.E. that ordinary Roman soldiers could enter into legal marriage, although before then many maintained households with women and children. The evidence from Vetera I also raises the possibility of women and children at commercial sites at the fort, perhaps as vendors catering to the Roman army. Greek and Roman leaders complained of large numbers of women (including prostitutes) and children encumbering the travel of armies, but some also expressed the view that family members motivated male soldiers to fight.

Roman authors also described women who fought on the side of the Romans' opponents. Plutarch (46-c. 119 C.E.) described a battle between the Romans and the invading Cimbri (believed to be a Germanic or Celtic people) in France in 102 B.C.E. in which Cimbri women fiercely defended themselves against Roman attackers. Another historian, Tacitus (c. 56-120 C.E.), wrote of Germanic women exhorting their men to fight the Romans.

Medieval World

As in previous ages, women and children in medieval times assisted soldiers, accompanied militaries in their travels, and played various roles in supporting wars. Combat remained chiefly a male domain, although exceptional girls and women engaged in warfare. The best known of these is Joan of Arc (c. 1412-1431), a French farmer's daughter who during the Hundred Years' War (1337-1453) claimed that Christian saints had come to her in visions instructing her to aid in ousting the English from France. At approximately age seventeen, dressed in armor, she led



F. R. Niglutsch

Red Cross nurses arrive in Athens during the Greco-Turkish War (1897).

French soldiers in the Battle of Orléans (1429), driving the English from the city. However, in 1430 the Burgundians captured Joan and sold her to the English, who accused her of witchcraft and heresy and also condemned her for wearing men's clothes. In 1431, the English burned her at the stake in Rouen. In 1920, the Catholic Church made Joan of Arc a saint.

In Europe and other regions, women and children less renowned than Joan of Arc played roles in preparing for, participating in, and supporting wars. Women and children accompanied men in the Crusades, between the late eleventh and thirteenth centuries, to remove Muslims from power and establish Christianity in Jerusalem and other sites in Palestine considered holy to Christians, as well as to convert non-Christians to Christianity. In the Crusades and other wars, women and children performed arduous labor for armies, carrying heavy supplies, digging ditches, collecting wood for fires, and washing garments and linens.

In *Le Livre des fais d'armes et de chevalerie* (1410; *The Book of Fayttes of Arms and of Chivalry*, 1489), the Venice-born writer Christine de Pizan (c. 1364-c. 1430), who spent most of her life in France, examined tactics and rules of warfare. Among the topics she discussed was training the children of knights and common people in the use of arms and in other skills so that they would be able to fight effectively and defend against invaders. Indeed, adults considered children's playing at war and with fencing swords, and hunting, as training for combat.

Christine de Pizan articulated the assumptions of many of her predecessors and contemporaries, that women were weak and, along with children and aged men, of little use in warfare, even in defense during the siege of a fortress (although she did suggest that women might aid in boiling water to pour on would-be invaders). In an imagined discussion with an expert on matters of warfare, Christine de Pizan's interlocutor observed that "those who follow the military custom" should be "ashamed to imprison women, children, helpless and old people." As to the question of whether it

would be just for an enemy to hold a child for ransom, the response was that "reason does not agree that innocence should be trifled with; for it is evident that the child is innocent and not guilty in anything connected with war." Thus, like other scholars before, during, and after the Middle Ages, Christine de Pizan's depiction of warfare as essentially constituting conflict between men obscured the roles played by women and children and positioned them mainly as encumbrances and victims.

Modern World

Although in modern times males continued to dominate in waging war, occasionally women led armies or, as heads of state, saw their countries through war. Queen Njinga Mbande of Angola (1582-1663) led her military against Portuguese slave traders. The rani of the Indian district of Jhansi, Lakshmi Bai (born c. 1830), who previously had cooperated with British officials, in 1858 led battles in a rebellion against them, losing her life. Despite the complexity of her relationship with the British, she became an enduring symbol of Indian resistance to colonial rule. Golda Meir (1898-1978) served as prime minister of Israel during the 1973 Arab-Israeli War, which began when Egyptian and Syrian forces launched a surprise attack on Israel on Yom Kippur, a Jewish holy day. In 1982, when Argentina attempted to reclaim the Falkland Islands, a British territory located in the Southern Hemisphere, British prime minister Margaret Thatcher (born 1925) oversaw the dispatch of United Kingdom forces to the archipelago and succeeded in retaining it.

According to the eminent military scholar Barton Hacker, "During the decades that spanned the end of the nineteenth century and the start of the twentieth, Western armies became almost exclusively male, perhaps for the first time in history." Women still provided crucial support for professional Western militaries, but they were physically more separated from male soldiers than in previous eras, when they had lived and worked with them in close proximity. In independence and revolutionary movements in various parts of the world, however, women participated as combatants as well as in support roles, as in uprisings against colonial governments in Latin America in the early 1800's and China's Taiping Rebellion (1850-1864).

National Archives

A woman works as a riveter at Lockheed Aircraft Corporation in Burbank, California.

In the latter part of the twentieth century, women in numerous countries attained official status as soldiers in their nations' armed forces, among them the United States (1948), the United Kingdom (1949), Canada (1951), Germany (1975), Norway (1977), the Netherlands (1979), and Spain (1988). Most countries did not draft women or allow them into direct combat. As of 2006, the countries that did draft women were China, Eritrea, Israel, Libya, Malaysia, North Korea, Peru, and Taiwan. In some societies, the inclusion of women as official members of the armed forces resulted from recognition of their effectiveness in World War II and from evolving views of gender equality. Besides serving as official members of armed forces, women in the twentieth century participated in wars as resistance fighters and guerrillas—for instance, against the Germans in World War II and in anticolonial and civil wars in Africa and Asia.

Although sexual assaults against women and children, and sometimes against men, had occurred in wars since ancient times, the 1998 Rome Statute of the International Criminal Court declared that rape, forced pregnancy, and other forms of sexual violence constituted crimes against humanity and war crimes. These weapons of war had been recently used against girls and women, many of them Muslim, in conflicts in the former Yugoslavia during the 1990's, and against Tutsi girls and women in the 1994 Rwandan genocide.

NARA

In a now-famous World War II poster, Rosie the Riveter enjoins women to support the war effort.

In modern times, changing attitudes about childhood and about protecting children from warfare gained traction in many countries. Children's advocates sought the protection of children in international and civil wars from conscription, dislocation, hunger, disease, poverty, torture, sexual assault, psychological trauma, land mines, and other risks to their well-being. The 1989 United Nations Convention on the Rights of the Child declared that states could not recruit children under the age of fifteen years into their armed forces. However, boys and girls served as soldiers into the early twenty-first century in Burma, Colombia, Nepal, Sri Lanka, Somalia, Sudan, and more than a dozen other countries. Australia, Canada, the United States, and several European countries allowed seventeen-year-olds to serve in their militaries in noncombat roles.

Books and Articles

Allison, Penelope M. "Engendering Roman Spaces." In *Space and Spatial Analysis in Archeology*, edited by Elizabeth C. Robertson et al. Calgary, Alta., Canada: University of Calgary Press, 2006. This article illustrates the challenge of using archaeological evidence to ascertain and evaluate the presence of women and children at Roman sites.

De Pauw, Linda Grant. *Battle Cries and Lullabies: Women in War from Prehistory to the Present*. Norman: University of Oklahoma Press, 1998. A detailed, wide-ranging, and highly informative examination of women's (and, to a lesser extent, children's) support of militaries and involvement in wars around the globe and across millennia.

Filipovi , Zlata, and Melanie Challenger, eds. *Stolen Voices: Young People's War Diaries from World War I to Iraq*. Foreword by Olara A. Otunnu. New York: Penguin Books, 2006. Firsthand accounts from adolescents and young adults who experienced the effects of war in Europe, Asia, the Middle East, and the United States.

Fraser, Antonia. *The Warrior Queens*. New York: Alfred A. Knopf, 1989. A history of exceptional women rulers in wars from antiquity through the late twentieth century.

Hacker, Barton C., and Margaret Vining, eds. *A Companion to Women's Military History*. Leiden, the Netherlands: E. J. Brill, 2010. Edited by historians at the Smithsonian Institution in Washington, D.C., this collection of essays examines women's support of militaries and engagement in warfare, from the European medieval era through the early twenty-first century.

Li, Xiaolin. "Chinese Women Soldiers: A History of Five Thousand Years." *Social Education* 58, no. 2 (1994): 67-71. A summary of Chinese women's military roles from ancient to modern times. Li shows that although Chinese women led militaries as long ago as c. 1200 B.C.E., fought in defense of homes and in uprisings, and performed vital work for armies, the modern Chinese military remains male-dominated, and women do not serve in combat positions.

Marten, James, ed. *Children and War: A Historical Anthology*. New York: New York University Press, 2002. This collection consists of twenty-one topical essays by scholars of history, psychology, and other academic disciplines on children's experiences of war, cultural beliefs regarding children and war, and teaching children about wars.

Rosen, David M. *Armies of the Young: Child Soldiers in War and Terrorism*. New Brunswick, N.J.: Rutgers University Press, 2005. Rosen, an anthropologist and legal scholar, scrutinizes the complex subject of child soldiering by considering perplexing questions such as whether a universal age of adulthood can be established and the extent to which children exercise self-determination in serving as soldiers. Chapters on Jewish child partisans in World War II, child soldiers in Sierra Leone's civil war (1991-2001), and Palestinian children's militant opposition to Israel illuminate the experiences, perspectives, and problems of child soldiers.

Donna Alvah

SCIENCE AND WARFARE

Biology, Chemistry, and War

Overview

Science and war have always developed side by side. New inventions were often made during war or to further bellicose goals. Scientists were tasked with inventing weapons that could kill the enemy more efficiently or ways to protect their governments' own forces. Biology is the science of all living organisms. Biological warfare, also known as germ warfare, is the use of viruses, bacteria, or other disease-causing living organisms as biological weapons (bioweapons). Chemistry deals with the structure, composition, and properties of all kinds of matter and the reactions they may cause in interaction. The use of nonliving toxic products as weapons is considered chemical warfare. Both biological and chemical weapons can occur in nature and be employed as weapons, which tended to happen in ancient and medieval times. In modern times, science and technology have been applied to develop such weapons and the means of delivering them.

Significance

Both biological and chemical weapons are considered to be weapons of mass destruction (WMDs), since they are designed to kill millions of people, and thus they pose a grave threat to humanity as a whole. Sometimes called "the poor man's atom bomb," the sheer existence of these weapons inflicts fear, and because the threat of their use is a potent means of intimidation, their effect can be more psychological than real. Whoever is in possession of such weapons will have the upper hand in any conflict, at least once conventional means fail, and this makes the party possessing chemical or biological weapons a potential aggressor, feared by neighbors. These WMDs not only threaten annihilation and defeat; their inhumane nature has also led to their banishment in the modern world.

History of Biology, Chemistry, and War

Ancient World

Early recorded uses of bioweapons include the poisoning of wells by toxic plants during the First Sacred War in Greece (595-586 B.C.E.) and by the Roman commander Manius Aquilius in 130 B.C.E. Wells were often poisoned by placing poisonous plants, dead horses, or even killed persons in them. In sea battles, catapults, or ballistae, were sometimes loaded with snakes, which were lobbed onto the decks of enemy ships and caused panic aboard that confined space.

According to archaeological evidence, bitumen and sulfur crystals were ignited by the armies of ancient Persia to give off a dense, poisonous smoke that killed Roman soldiers. Sunzi's *Sunzi Bingfa* (c. fifth-third century B.C.E.; *The Art of War*, 1910) and Hindu books describe ways to poison wells, create toxic smoke, and poison weapons. The effect of such weapons seems to have been limited, however.

Medieval World

In medieval times, the poisoning of wells continued. Even though the exact mechanisms of infection remained unknown, it was clear that disease could spread from animals to people or from person to person. Aggressors, when laying siege to a town, would catapult sick or dead animals into the town, hoping that the carcasses would infect the inhabitants. Victims of the bubonic plague (Black Death) or decomposing corpses were also shot into besieged towns, as were feces. During the Siege of Caffa in 1346, the besieging Mongol forces catapulted cadavers of plague-infested animals into the city. However, the plague most likely first affected the attackers. Thousands were killed, according to eyewitnesses. The Black Death spread from there toward Constantinople, Italy, and France. It is unclear whether and to what extent the use of bioweapons contributed to this pandemic.

Gunpowder, a chemical invention and hence a form of chemical weapon, revolutionized warfare. Military units were now able to fight numerically superior forces, fortifications could be breached more easily, and small groups of skilled knights gave way to mass formations of riflemen.

MODERN WORLD

In the fifteenth through eighteenth centuries, Europeans colonizing the Americas, perhaps unbeknownst to them at first, brought many diseases with them to the New World, and these essentially functioned as biological weapons, even when they were not initially intended as such. Smallpox epidemics raged among indigenous Americans, and there have been allegations that British commanders spread the disease deliberately to quell Native American uprisings. While it is a fact that smallpox had a very high morbidity rate among Native Americans, because of their complete lack of immunity to the virus, and thus affected them more than the European settlers, those allegations cannot be proved in most cases. However, some evidence exists to support the intentional use of the smallpox virus against Native Americans. In 1763, during Pontiac's Rebellion, one "Mr. McKee" and Captain Simeon Ecuyer, the commanding officer at Fort Pitt, gave "two blankets and a handkerchief out of the Small Pox Hospital" to Delaware chiefs with the "hope it will have the desired effect."

Smallpox caused many casualties during the American Revolution (1775-1783), and there are allegations that it was spread deliberately by both sides. Again, there is no way to prove this today, and analysts still argue whether this kind of biological warfare took place or events occurred naturally. Native Americans, for their part, poisoned wells by throwing killed animals in them, a method repeated during the American Civil War (1861-1865). Additional proposals were brought forward to produce various types of chemical weapons during the Civil War, but it was thought that battlefield doctors and nurses would have a difficult time dealing with the effects of these weapons, and the proposals were shelved. Other nations drew back from chemical weapons as well. Some in the British military, during the Crimean War (1853-1856), proposed to use cyanide, but it too was rejected.

During the Second Sino-Japanese War (1937-1945), the infamous Japanese Army Unit 731 conducted experiments on thousands of people in occupied China. The unit was formed and headed by General Shirō Ishii (1892-1959). Ishii started with experiments in 1932 and was given control of his own research facility in 1936. He was appointed chief of the Biological Warfare Section in 1940 and headed Japan's bioweapons program, the largest of any nation during the war, until the end of the war. He received immunity from prosecution in 1946. During World War II, Japanese Army Unit 731 (with up to three thousand men) and other special units tested various agents on Chinese prisoners of war as well as civilians, usually disguising the tests as vaccinations or claiming that they were for medical research. Around 400,000 people are thought to have perished in these "experiments" and deliberate attacks. In October, 1940, bubonic plague was spread in the Chinese cities of Qu Xian (Chü-hsien) and Ningbo, killing twenty-one and ninety-nine people, respectively. Another attempt in November in Kinhwa did not lead to a breakout of plague. By the end of 1941, prisoners of war were infected with typhoid. Anthrax was used in May, 1942, in retaliation for the Doolittle raid, but when the disease also spread to retreating Japanese troops, Ishii was relieved of command of Unit 731. As efforts to develop an aerosol failed, rats and insects were infested with bubonic plague and set free in cities or dropped in ceramic bombs.

Programs to weaponize diseases, including various forms of plague and anthrax, were carried out by other states as well. Such efforts continued after World War II. The U.S. program was headed by George W. Merck (1894-1957) and Ira Baldwin (1895-1999), who became the first director of the U.S. Biological Warfare Laboratories in Maryland in 1943. There are allegations of bioweapons, developed under Baldwin, being used during the Korean War by the United States.

Chemical weapons are most widely associated with World War I. German scientists developed various types of WMDs for this conflict, although the term "gas war," often applied to this war, is somewhat mis-

leading. The chemical agents used were mostly liquids or aerosols; some of these agents would develop into a gas only over time or were delivered as a fine spray that looked like a gas. Methods of deployment varied. First, canisters with the liquids were brought up to the front and opened, facing the enemy, where it was hoped that the wind would blow the gas or aerosols toward enemy lines. In many cases, shifting winds inflicted more casualties on the side that had deployed the chemical weapons. Later, grenades were filled with the chemical agents and fired against the enemy. Upon impact, they burst apart and spread the liquids. Airplanes were also used to spray the chemical weapons over large areas.

AP/Wide World Photos

Israeli students wear gas masks in 2003 during a drill to prepare them for the possibility of a chemical attack.

Chlorine gas was first used on April 22, 1915, by the German army at the Second Battle of Ypres (1915) on the western front. The German army deployed some 5,700 cylinders north of Ypres, containing nearly 170 tons of chlorine. The gas was released, forming a gray-green cloud that drifted toward French colonial troops, who broke ranks. The Germans used gas on three more occasions during that battle. Some ninety men died immediately from gas poisoning in the trenches, more than two hundred were wounded, and sixty of them later died. As the Germans were also afraid of the effects of the gas and lacked reinforcements, the break in the front lines could not be exploited. These scenes would be replayed often during the remainder of the war. "Gas attacks" in the end had more of a psychological than a truly military effect.

Lethal in high doses, its smell and color made chlorine a relatively ineffective weapon, as it could easily be spotted. Phosgene, more lethal and harder to detect, was later used. Both agents caused harm to the eyes and lungs of victims, leading to asphyxiation. Perhaps the most notorious chemical weapon deployed in World War I was the so-called mustard

gas (dichloroethyl sulfide), which stuck to surfaces for hours. This weapon, a vesicant (blistering agent), attacked the eyes and lungs and functioned as a systemic poison. The use of gas masks during the war resulted in its being responsible for relatively few fatalities, but its use was feared and lethal to those unprotected, and it would later be used against poorly equipped armies in Ethiopia (1935-1936) and the Iran-Iraq War (1980-1988).

A leading scientist on the German side was Fritz Haber (1868-1934). After research in the field of fertilizers and explosives, Haber developed chlorine gas for chemical warfare. His wife, Clara, committed suicide after she learned of the effects the weapon had in Ypres. Together with Carl Bosch (1874-1940), Haber developed the Haber process, which can be used to extract nitrogen from the air to use in fertilizers under conditions of low temperature and high pressure. For this achievement he was awarded the Nobel Prize in Chemistry in 1918, despite also being the "father of the Gas War." A Jew, Haber fled Nazi Germany in the 1930's.

Most states worked on chemical weapons in the interwar period and had huge stockpiles of them ready for use by World War II (1939-1945). These ultimately were not used, as both sides feared the effects of these horrendous weapons. After the war, more powerful toxins were developed, mostly "nerve agents." These compounds would cause muscle spasms, ultimately leading to failure of the respiratory or circulatory system. The compound known as VX, tasteless and odorless, with the texture of motor oil, was one such nerve agent. When entering the body, it blocks an enzyme that triggers nerve pulses; the victim then suffers severe muscle contractions, which ultimately lead to death.

AP/Wide World Photos

Pictures of a mangrove forest in Vietnam both before (top, in 1965) and after (in 1970) treatment with the herbicide Agent Orange.

During the Vietnam War (1961-1975), the United States used various types of chemical agents, such as Agent Orange—not against persons but as defoliants, to deforest the jungle areas in Southeast Asia. The detrimental effect upon animals and also people, due to its high content of dioxin, was unintended and discovered only later.

In 1988, Iraqi dictator Saddam Hussein (1937-2006) used poison gas against Kurdish civilians in Halabja during the Anfal campaign. Kurdish villages were bombed by the Iraqi Air Force with multiple agents,

most likely including mustard gas, and the powerful nerve toxins sarin, tabun, and possibly VX. Some five thousand civilians were killed in this incident alone. Iraq also used poison gas during the Iran-Iraq War. Western sources did not at first believe this and even claimed that Iran, not Iraq, had used the weapons. The United States later referenced this use and ability to manufacture such chemical weapons to make the case that Iraq still possessed WMDs.

On March 20, 1995, the Japanese Aum Shinrikyo sect used sarin gas for a terror attack on the Tokyo subway system, the first modern use of a WMD by terrorists. This incident shocked the world and highlighted how vulnerable civilian populations were to chemical and biological attacks.

Today, both biological and chemical warfare are covered by conventions under the auspices of the United Nations. The 1992 Convention on the Prohibition of the Development, Production, Stockpiling, and Use of Chemical Weapons and on Their Destruction, administered by the Organization for the Prohibition of Chemical Weapons, and the 1972 Biological Weapons Convention, signed by more than one hundred countries, outlaw the storage, stockpiling, and use of these weapons.

Books and Articles

Barenblatt, Daniel A. *Plague upon Humanity: The Secret Genocide of Axis Japan's Germ Warfare Operation*. New York: HarperCollins, 2004. Summary of the known facts about Japan's biological warfare capability, carefully developed with the direct support of the emperor and tested in China.

Endicott, Stephen, and Edward Hagerman. *The United States and Biological Warfare: Secrets from the Early Cold War and Korea*. Bloomington: Indiana University Press, 1998. The authors present an impressive array of evidence that the military and executive branch lied to Congress and the public about the development of biological weapons and even used them in Korea.

Harris, Sheldon H. *Factories of Death: Japanese Biological Warfare 1932-45 and the American Cover-Up*. New York: Routledge, 1994. Meticulous research on Japan's secretive experiments on live human beings and U.S. complicity in covering up the truth after World War I.

Jones, Simon. *World War I Gas Warfare Tactics and Equipment*. New York: Osprey, 2007. Explains practical details, such as the means and tactics of delivery, the effects and influence on the battles, and the race to produce better protection for the troops on both sides, of this type of warfare, which became one of the dominant aspects of World War I.

Mangold, Tom, and Jeff Goldberg. *Plague Wars: A True Story of Biological Warfare*. London: Macmillan, 1999. Covers research facilities and scientists in the former Soviet Union, the United States, and other countries.

Mayor, Adrienne. *Greek Fire, Poison Arrows, and Scorpion Bombs: Biological and Chemical Warfare in the Ancient World*. Woodstock, N.Y.: Overlook Duckworth, 2003. Shows that biological and chemical weapons saw action in battles long before the modern era.

Robinson, P. J., and M. Leitenberg. *The Rise of CB Weapons*. Vol. 1 in *The Problem of Biological and Chemical Warfare*. Stockholm: SIPRI, 1971. Detailed account of research and development in biological and chemical warfare worldwide and the often little-known use of biological and chemical weapons.

Williams, Peter, and D. Wallace. *Unit 731: Japan's Secret Biological Warfare in World War II*. New York: Free Press, 1989. Explains this infamous unit and its projects in China.

Thomas Weiler

Medicine on the Battlefield

Overview

Military medicine aims to keep soldiers and sailors fit enough to fight. While it is likely that battlefield medicine has existed as long as humans have fought over territory, the subject has received comparatively little attention in the historical record. Much of this gap is attributable to poor record keeping as well as a general lack of interest; few people besides military physicians have demonstrated any interest in military medicine. Most accounts of military medicine over the centuries are found in nonmedical writings, such as memoirs, histories of battles, and diaries as well as works of art.

Significance

Military medicine on the battlefield cannot be viewed in the narrow confines of a field of combat. It encompasses the treatment of injuries sustained on the battlefield, from spear wounds to gunshot wounds, as well as the side effects of such injuries, such as shock and infection. Medicine on the battlefield begins with the recruitment of troops who are healthy enough to fight on the battlefield. It continues with the maintenance of the health of fighters through adequate sanitation, the provision of safe foods, and the availability of clean water. It proceeds with the treatment of the wounded on the field and in hospitals. Battlefield surgeons have also shaped public policy to ensure better treatment of the wounded.

History of Medicine on the Battlefield

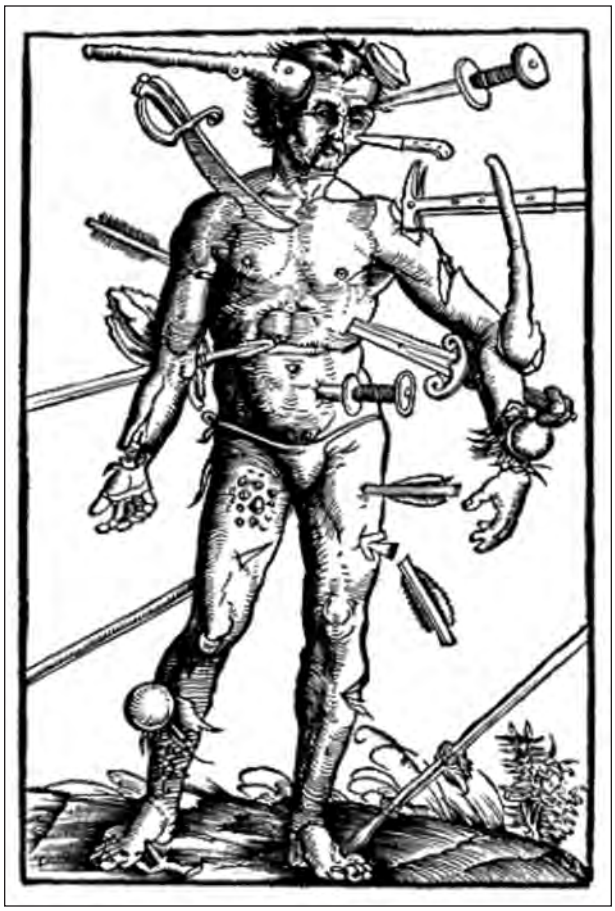
Ancient World

In the ancient world, killing technology and defensive technology were fairly well balanced. As a result, ancient battlefields were not more dangerous than modern battlefields. Soldiers had an excellent chance of surviving attacks by axes, swords, javelins, and spears. Nevertheless, war wounds appear to have been a constant threat for ancient men. Classical literature gives the impression of nearly continuous warfare in the ancient world. The treatment of war wounds is the only kind of medical activity mentioned in the *Iliad* (c. 750 B.C.E.; English translation, 1611), the earliest Greek source available. Hippocrates (460-377 B.C.E.), the Greek father of medicine, advised that "He who would become a surgeon should join the army and follow it."

Broken bones were the most common battlefield injuries. Ancient Egyptian and Sumerian medical texts discuss broken bones extensively, indicating that military physicians were quite familiar with them. The injured soldier had the greatest risk of dying from the side effects of battlefield injury: tetanus, gas gangrene, and septicemia. The tetanus bacterium is commonly present in soil and is found in greater numbers in richly manured soil, which was typical of agricultural societies of the ancient world. The ancient medical practice of leaving the wound unsutured for several days before closing was likely to produce far fewer tetanus infections than the process of rapid closure used from the medieval period to World War I. Gangrenous wounds likely produced 100 percent mortality. Ancient military physicians repeatedly cleansed wounds for several days before closure, thereby removing necrotic (dead) tissue and greatly reducing the risk of gangrene. Again, this habit disappeared after the fall of Rome with the result of a high death rate until World War I. Septicemia or blood poisoning is caused when bacteria enter the bloodstream. Wounds to arteries and major veins caused the greatest risk of septicemia. Until the invention of antibiotics in the twentieth century, septicemia almost always killed.

Available data on wound mortality and infection produce a rough statistical profile of the causes of

battlefield death. Of 100 soldiers wounded in action, 13.8 would die of shock and bleeding within two to six hours. The numbers were lower for Roman soldiers. Like other ancients, the Romans knew to use a tourniquet to stop bleeding and prevent shock. Unlike their peers, the Romans had the organizational skills to move the wounded quickly from the battlefield to a hospital where physicians could tie off the severed arteries. Another 6 percent of the wounded would likely contract tetanus, and 80 percent of those would die within three to six days. About 5 percent would contract gangrene, of whom at least 80 percent would die within a week. Septicemia struck less than 2 percent of soldiers but generally killed them all within ten days. Most soldiers died of disease rather than the result of combat, which would remain the case until the twentieth century: Ignorance about such dangers as typhus and dysentery, as well as improper nutrition, ensured this greater risk.



An illustration from an early sixteenth century German field manual for wound treatment, by Hans von Gersdorff, shows typical wounds. The image is by Hans Wechtlin.

MEDIEVAL WORLD

The same four major factors—shock and bleeding, tetanus, gangrene, and septicemia—would serve as the leading causes of death among military wounded until the twentieth century. The near-total disintegration of Western culture following the fall of Rome in 476 C.E. resulted in the loss of most medical knowledge until the Renaissance. The only significant development is found in the Byzantine military, which provided each battalion with its own detachment of two physicians, a general practitioner and a surgeon. The medical staff was augmented by eight to eighteen medical orderlies, who served as combat medics and stretcher bearers. The Byzantines copied the Roman practice of immediate medical treatment. Unlike the Romans, they gave medical personnel a gold bonus for every wounded soldier rescued from the battlefield and brought to the medical tent.

The Islamic world practiced medicine based upon the Qurʾān. Since the Qurʾān prohibited dissection, medical personnel lacked a thorough knowledge of the body, as did physicians in the West. Fevers and infection were treated by bleeding and purging, again similar to Western practice. Surgery was akin to butchery, with amputation being accomplished by repeated blows with a short sword or mallet, after which the limb was submersed in boiling pitch or oil to cauterize the limb. Bone setting was crude, with the result that the limb was often left distorted. However, since Islamic medicine relied more upon drugs than surgery, the Arabs developed superb pharmaceutical knowledge. They used hemp fumes as anesthetics and preoperative compounds to induce sleep before surgery.

In the Renaissance, the military barber-surgeon emerged as a familiar figure in Western armies. Prior to about 1453, Western armies often relied upon "cutters," men who followed the troops and tended the wounded for a fee extracted from the soldier him-

AP/Wide World Photos

U.S. Marines get plasma transfusions during the 1945 invasion of Okinawa.

self. These cutters were typically the only source of medical care for the common soldier. The barber-surgeons, many of whom had probably begun as cutters, acquired a high level of medical craftsmanship, especially in surgery. They needed this skill to deal with the shattered bones produced by the new invention of gunpowder. Amputation proved the most common treatment for gunshot-induced compound fractures, in which there is an open wound of the soft parts leading down to the break in the bone. Such fractures became the most common battlefield injury. A French barber-surgeon, Ambroise Paré (1510-1590), developed the best technique for performing battlefield amputations. He used ligature prior to amputation, as the Romans had done. Instead of plunging the limb into boiling oil, Paré treated the amputation with a mixture of egg yolk, oil of roses, and turpentine. Paré's patients had lower infection rates, but few other physicians adopted his humane techniques until the nineteenth century.

Infection remained a major killer of soldiers. Often, Renaissance surgeons would remove a bullet by enlarging the wound and then probing for the missile with fingers or unsterile probes, increasing infection rates. Physicians would also stuff gunshot wounds with all sorts of foul materials to create pus that would presumably heal the injury. Infection often resulted. Gunpowder also created burns, and the most popular treatments were vegetable and animal ointments that usually induced blistering and scarring.

MODERN WORLD

Until the late eighteenth century, surgeons did some field surgery, but the wounded were typically gathered after the battle and brought to the surgeon. Military leaders feared that any attempt to remove the wounded would disrupt the fighting integrity of the unit. The wounded often lingered for hours and sometimes days before being evacuated. This situation did not improve until the Napoleonic Wars (1793-1815), when Baron Dominique-Jean Larrey (1766-1842) invented "flying ambulances" that located, treated, and evacuated the wounded under fire.

The state of medical knowledge was also advancing in the eighteenth century. Surgery stopped being a technical craft practiced by physicians of a lower order while medical publishing expanded. In this century, governments accepted the obligation to provide and pay for the military medical care of the common soldier. In 1776, military surgeon John Jones (1729-1791) published the first American textbook on surgery as well as the first American medical book. Jones, who had served colonial troops during the French and Indian War (1754-1763), treated Revolutionary War soldiers as a surgeon with the Continental Army. His book *Plain Concise Practical Remarks on the Treatment of Wounds and Fractures* (1776) provided a guide to surgery and advice on hygiene. As Jones realized, in times of revolution, recruits were eager to join the fighting,

with the result that large numbers of marginally healthy adults with poor sanitary habits entered military service.

Eighteenth century military medicine benefited from a number of new techniques. Styptics were commonly used to stop minor bleeding. Pressure sponges, alcohol, and turpentine were used to treat minor wounds. Cauterization of arteries was still practiced but with less frequency, since the invention of locked forceps. The screw tourniquet made thigh amputations possible and greatly reduced the risk associated with amputations below the knee. Military surgeons place greater emphasis on preparing limbs for prosthesis as flap and lateral incision amputations became common procedure.

In the early nineteenth century, military doctors began to record what they observed with the aim of changing public policy and improving the health of the army. As an additional concern, the deaths of soldiers overseas proved to be a burden to the taxpayer. In 1863, the Royal Commission on India estimated that Great Britain lost £588,000 annually from sickness among the troops in India alone. The financial impact of disease prompted more governments to focus their resources on the improvement of military medical care.

The most common battlefield injury continued to be compound fractures from bullets and cannonballs propelled by gunpowder. Many such fractures were infected, since there was a likelihood that pieces of clothing, contaminated soil, and other substances would enter the wound. Treatment proved very difficult. During the American Indian Wars of the late nineteenth century, Louis Anatole LaGarde (1849-1920) realized that the act of firing a bullet does not, as had previously been thought, sterilize a projectile and that bullets can therefore induce sepsis from a wound. He published his discovery in 1893. In World War I (1914-1918), the British Army began using the Thomas splint and the U.S. Army employed the army leg splint. The patient was saved from shock, pain, and other symptoms that had made bone fractures frequently fatal. In 1918, the death rate from such injuries in evacuation hospitals dropped to 17.5 percent, an improvement of 40 to 50 percent over the rate in the first months of the war. In 1923, Hiram Orr, a Nebraskan who had served with both the British and the American forces in France during World War I, proposed a “closed treatment” for broken bones by encasing the leg splint in plaster of Paris casts. Orr’s treatment received its first military test during the Spanish Civil War (1936-1939). José Trueta (1897-1977), a Spanish surgeon, reported that of 1,073 gunshot fractures treated with casts, only six patients died. He also noted the almost complete absence of gas gangrene, a notorious killer among the wounded in previous wars.

Largely because of advances in military medicine during World War II (1939-1945), the death rate for combatants dropped dramatically. In the 1945 Battle of Iwo Jima, 32.6 percent of the U.S. Marines became casualties, making the campaign the bloodiest in the history of the Marine Corps. If the same casualties had been suffered by Union forces in the Civil War (1861-1865), the death rate would have been 14.6 percent. The overall death rate among wounded U.S. sailors and Marines for all Pacific campaigns stood at 2.3 percent. The improved figures resulted from administering first aid on the scene of battle, speedily evacuating the wounded, providing whole-blood transfusions, and using penicillin. In 1943, wounded U.S. soldiers returning from the Pacific became the first group of soldiers to receive the newly invented antibiotic. Tests on American soldiers in 1943 and 1944 revealed that penicillin reduced the death rate from staphylococcal infections from 75 percent to 10 percent while limiting infection from wounds and burns.

In the subsequent decades, military physicians improved their treatment of shock with readily available blood and transfusions. Vascular surgeons were used on the front lines for the first time during the Korean War (1950-1953). During the Vietnam War (1961-1975), helicopters with trained corpsmen aboard quickly evacuated the wounded to hospitals. Of the wounded who were still alive upon reaching a hospital, 97.5 percent survived. The Iraq War (beg. 2003) led to improvements in the treatment of combat trauma, particularly vascular injuries.

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Caryn E. Neumann

Psychological Effects of War

Overview

In the anticipation of conflict, as well as during the fighting itself and afterward, there have long been known to be psychological effects on the people—both combatants and noncombatants—affected by conflict. In the ancient and medieval world, this was little understood, because there was not much understanding of the workings of the mind or of mental illnesses, although the effect of the nature of the cruelty in war would have led to trauma that would have been noticed by all. Much of the work on the psychological effects of warfare started with World War I (1914-1918), when, for the first time outside a siege situation, people were involved in fighting over many weeks or months.

Significance

The topic of war's pscyhological impact took on significance gradually over the course of the twentieth century. During World Wars I and II, many instances of "shell shock" (combat fatigue) were reported, but not seriously addressed, by the psychological establishment. However, with the return to the United States of large numbers of American veterans after the Vietnam War (1961-1975), the massive number reporting psychological problems caused the issue to receive more of a focus. Diagnoses of post-traumatic stress disorder (PTSD) skyrocketed, and both practicing and academic psychologists began to address the needs of returning soldiers (though the effects of warfare on civilian groups, who are often just as seriously damaged as soldiers, received far less attention).

History of the Psychological Effects of War

Ancient World

In the ancient world—although little was known about the workings of the mind—enthusiasms, shock, and trauma would have been noticeable. Many of the writings of the Greeks and the Romans pay great respect and honor to those who fought for their city or country. Nevertheless, many people clearly did whatever they could to avoid conflict, and most, such as the ancient historian writer Flavius Josephus, rejected the idea of "honorable" wartime service or suicide in favor of living, albeit in a Roman-dominated world.

Even though there are many examples of wanton cruelty, such as the brutal "games" in the Colosseum in Rome and other arenas where people fought each other or wild animals, there were still many Romans who shunned these events. Most Romans, moreover, if we are to believe the writings that survive, were far from the fighting, while some who wrote of war, like Julius Caesar, could reflect on the events from the relative safety of battlefield command. Being so far from the scenes of cruelty and killing, and aware that these battles served to build the empire, the citizens of Rome certainly entertained great war fever and rejoiced in their triumphs; those involved in the fighting themselves, however, often felt very differently. One early recorded example of obvious trauma was during Caesar's siege of Alesia in 52 B.C.E. The Gauls, holding out but running short of food and desperate, forced their women and children out into the no-man's-land between the Gallic fortifications and those of the Romans, leaving them to die.

Certainly Caesar and the Romans also understood the need to terrify people who opposed the Romans, and they did this by their triumphal marches through Rome, after which large numbers of captives were murdered in public, while some of their number were

allowed to return home to tell people of the horrors they had seen and the mighty power of the Romans. Similar tactics would be followed by countless armies throughout history.

MEDIEVAL WORLD

In Europe during the "Dark Ages" and the later medieval period, there are many examples of wanton cruelty to terrorize people. During the Viking raids on England in the eighth, ninth, and tenth centuries, the tactic of desecrating the bodies of the dead served to frighten their opponents; likewise, the Mongols, Saracens, and Crusaders sacked whole cities in the expectation that other cities would quickly surrender.

Since ancient times, people had lived in fortified settlements throughout the world, and this continued into the Middle Ages as a defensive measure against both invasions and civil wars. Castles were built to provide protection, and hence were regarded as comforting symbols of safety, but also to intimidate, and thus could also be seen as signs of oppression. The motte-and-bailey castles in Norman England and the great castles built by Edward I in Wales were intended to overawe the population and show them who ruled the regions where they were built.

Hatred of people from rival kingdoms was combined with the concept of treason: the support of war against one's own rulers. In many cases, wars clearly wreaked havoc on the ordinary people, especially those in unprotected villages. Attacks by English raiders traumatized Joan of Arc during her childhood, and the earlier persecution of the Cathars in southern France was conducted with such ferocity that its aim was clearly to create trauma in those who harbored "heretical" or unpopular beliefs, or who supported those who did.

MODERN WORLD

During the Renaissance, there were efforts on the part of theorists and philosophers to rationalize and advocate this use of terror in war. Niccolò Machiavelli wrote about this, and Cesare Borgia practiced it. There were also clear campaigns of hatred against individual groups of people, especially Jews, who were blamed for many conflicts and other troubles during early modern Europe. In other cases the scapegoats were Protestants (as in the St. Bartholomew's Day Massacre in 1572) or Catholics (as in the English Civil War of the 1640's). Oliver Cromwell's destruction of Drogheda and Wexford also served to traumatize the people in Ireland into submission. Moreover, one should not exclude the actions of the Spanish in the Americas or the many European countries involved in the slave trade.

Throughout western Russia, in Flanders, and in many other parts of the world, fortified homesteads and farms were the norm until the early twentieth century. This sense of being potentially under attack at any time did much to affect the lives and lifestyles of these populations, who spent much of their lives worrying about when the next war might erupt. The French writer Guy de Maupassant's short story about the elderly lady trapping a Prussian soldier in her cellar reflects the effects such wars had on ordinary people.

If the trauma from war became well known in modern times, so also were modern governments able to harness the will of their own people in wartime by demonizing their opponents. William Randolph Hearst was able to use his newspapers to whip up a frenzy over war between the United States and Spain, and Joseph Goebbels in Nazi Germany ran the propaganda ministry, dedicated to getting people to follow the dictates of a government leading its people into war. Hatred of the enemy—whether blamed on the alleged behavior of the German soldiers in Belgium in 1914 or the anti-Semitism that was to lead to the Holocaust—must be counted among the psychological effects of war.

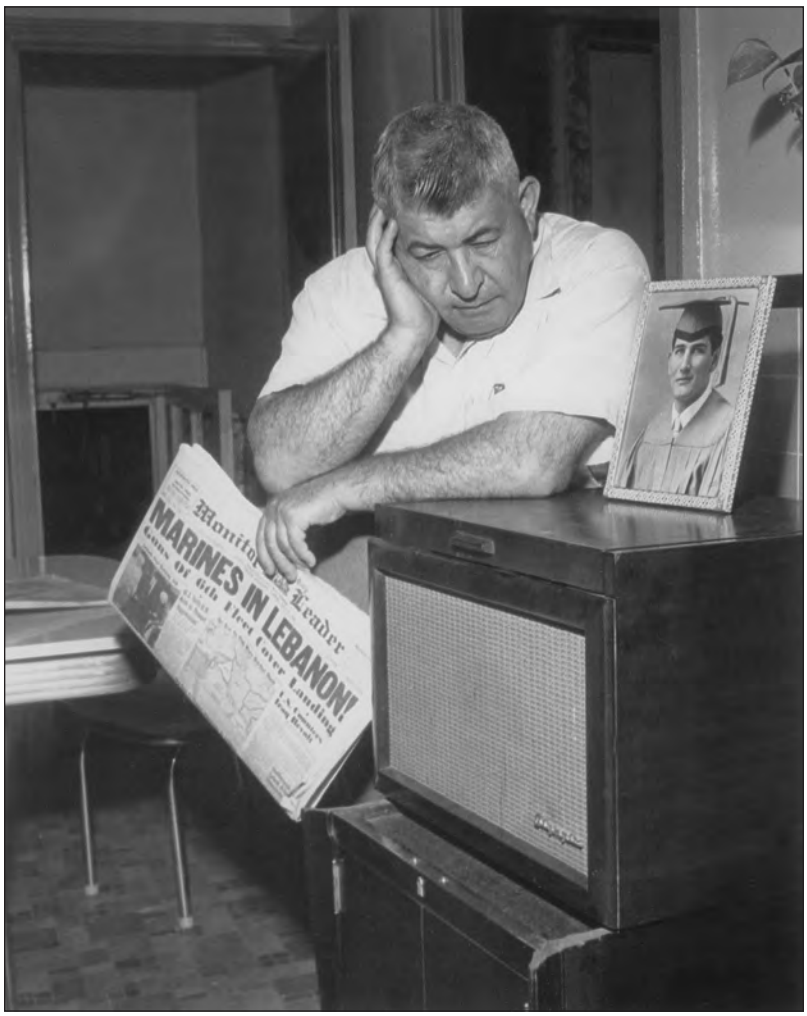
As for the soldiers themselves, until World War I little was known about what became called "shell shock," now known as combat fatigue. Much of this ignorance was because knowledge of the workings of the human mind was in its infancy, not really identified as an area of study until the early twentieth century. Also, until World War I, many modern military campaigns (excluding sieges) sustained only short periods of fighting. A study was made of two British soldiers who served in Spain in the Peninsular War (1808-1815) against Napoleon. Both qualified for fifteen clasps—the maximum awarded to any individual—since both had served in fifteen battles. In

the case of one of them, James Talbot, although he had survived fifteen battles, researchers found that he probably had been under fire for as much as twenty-four hours in his eight years of service. His regiment also suffered 123 killed in action. By contrast, the trench warfare of World War I saw men under fire for more than a week at a time, and as many men were killed each week in a regiment as were killed in the entire the Peninsular War some one hundred years earlier.

The idea of stress on soldiers in war—not just trauma in seeing their friends and other people being killed—was first recognized during the American Civil War (1861-1865); certainly civil wars have tended to be particularly traumatic, since they divide families and test friendships. In the Second Boer War (1899-1902), the judicial case of the Australian soldier Breaker Morant made mention of the psychological stress he and his co-accused suffered after they found the butchered body of a colleague. During the Russo-Japanese War (1904-1905), the Russians started to view war stress as a mental disease.

In 1915 in France, it was quite clear that many British (as well as French and German) soldiers were suffering from shell shock and other disorders related to combat stress. Although the British first used the term "not yet diagnosed (nervous)" (NYDN), and they set up centers several miles behind the battle lines to treat the mounting number of soldiers suffering from trauma and mental disorders, at the same time the British army was involved in executing some three hundred of their own soldiers for cowardice, many of them clearly victims of shell shock. There were also mutinies in the British and French armies, as well as the French navy—many of these becoming the subject of antiwar films.

After World War I, many of the soldiers returned to their homes shattered by what they had seen. With shell shock and trauma, many returned to families who had been largely untouched by the fighting, and few talked about their role in the war except to other soldiers. Many became mentally ill, and there were asylums throughout the world to treat people for shell shock and other psychological problems in the war.



National Archives

Lebanese-born James Thaber listens to President Dwight D. Eisenhower announce that he is sending U.S. troops to Lebanon in July, 1958; atop Thaber's radio is a picture of his son, a recent recruit into the U.S. Army.

Some soldiers also turned to alcohol. There were large numbers of suicides of former soldiers during the 1920's and 1930's, as well as violence against family members, especially wives and children. Some murders were clearly also related to the traumatic scenes many soldiers had encountered during the war.

World War II (1939-1945) was generally supported by the American and Allied populations, but, like the soldiers of World War I, many veterans of the later war returned to a world in which the social codes of the time discouraged sharing and verbal processing of their experiences, and like their earlier counterparts, many men elected to bury the horrors they had witnessed and move on with their lives—often finding, however, that the experiences of an entire, formative chapter of their youth were impossible to suppress and inevitably emerged through coping behaviors that led to alcoholism and emotional problems. In one sense, however, these veterans held an advantage: The nation was grateful, as evidenced by passage of the G.I. Bill and clear public support not only of the war effort but also of returning veterans.

After World War II, there were wars throughout the world that proved unpopular in their home countries. Some veterans from the Vietnam War found themselves ostracized when they returned home to the United States or to Australia. After Vietnam, soldiers often turned not only to alcohol but also to drugs (to which in many cases they had been introduced during the war). Likewise, veterans of the Iraq War—another war far less popular at home than World War II—became morose over their rejection by the same society that had sent them to war. In the case of Vietnam, and perhaps also in the case of Iraq, the society's lack of support for war veterans relative to their counterparts in World War II may also have occurred because these wars generally were considered lost, inadvisable, or at least not won in a clear victory.

However, what distinguishes more recent conflicts is that there have been many attempts to deal with the traumas experienced by their veterans. Not only has individual treatment become available to many soldiers, but there are also attempts to establish a "fair" end to any conflict. From ancient times, the end of a conflict meant that the victors were allowed to exert vengeance on the losers, in any way they wanted. In 1975, for example, when the Khmer Rouge communists captured the Cambodian capital of Phnom Penh, they evacuated the city of its two million inhabitants and turned the country into, essentially, a labor camp for their class enemies. By contrast, the Nuremberg and Tokyo trials at the end of World War II were designed to demonstrate a victory of justice over vengeance, when those deemed to be war criminals were arraigned in open court and, if found guilty, were jailed and in some cases executed. For many people these trials provided some form of closure based in law, in the same way that the Truth and Reconciliation Commission did in South Africa at the end of the war and civil insurrection there.

For the veterans themselves, recognition of posttraumatic stress and other mental and emotional disorders, not only after the conflict but also during combat, has increasingly led enlightened militaries to acknowledge and treat such cases while they are occurring. Identifying and counseling cases of PTSD is seen as not only important for the individual soldier but also essential for the military effort as a whole. The home society and family are also becoming increasingly aware of such psychological issues as veterans return to civilian life. Although no amount of counseling and treatment can address some of the psychological effects that will stay with veterans for their lifetimes, the recognition that such issues exist has served to bring them into the open and encourage both the society to offer help and veterans to seek it out.

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Justin Corfield

WARFARE, MORALITY, AND JUSTICE

Collaboration in War

Overview

Collaboration in war refers to the willful cooperation of local populations or elites with a foreign invader in a time of war. This can involve "fifth columns"—underground groups coordinated in advance of an invasion—or the impromptu recruitment of puppet regimes and auxiliary military forces in occupied territory. Collaboration is endemic to warfare, but its conflation with treason is a relatively recent Western development. Most scholarly work on the subject focuses on the motivations behind collaboration in the modern era, citing factors such as ideology, internal religious or ethnic divisions, material motives, and basic survival instinct. Both the invader and the collaborator are agents in the process.

Significance

Invading armies often seek the collaboration of enemy populations in order to limit casualties and expenditure of resources. Subversive activity by collaborators behind enemy lines can hasten the collapse of a defending force. Likewise, by co-opting local administrative personnel, an invader can improve security, exploitation, and communications in its occupied territories at relatively little cost. Regardless of motive, wartime collaboration can result in significant and lasting changes for a population. Whether successful or not, the presence of collaboration may ultimately force a society to redefine itself, both politically and culturally.

History of Collaboration in War

Ancient World

Collaboration has existed in some form as long as groups of people with divided loyalties and survival instincts have been in conflict with one another. Before the rise of the modern nation-state, such behavior did not necessarily have the ugly connotations it has today.

The Greek historian Herodotus (c. 484-c. 425 B.C.E.) demonstrates some concept of collaboration in his account of the Persian Wars, but its significance should not be exaggerated. Numerous Greek towns submitted to the Persians during Xerxes' invasion in 480 B.C.E. Free Greek city-states labeled them "Medizers" (the Greeks referred to Persia as Medea). The Persians gained troops and logistical support from most of the towns they occupied, not out of ideological consensus but for survival. Early resistance was crushed—towns were razed and populations enslaved—prompting widespread compliance. Based on the calculations of Herodotus, 15 percent of Xerxes' force at the Battle of Thermopylae (480 B.C.E.) was Greek. Persian victory at the battle was achieved when Ephialtes, a Greek seeking a reward, showed Xerxes a route through the mountains to outflank the Spartan defenders. Medizing continued even after the defeat of the Persian fleet at Salamis. Greeks provided the shock troops for the Persian forces at the Battle of Plataea in 479 B.C.E. The victorious free Greeks did not seek vengeance upon the Medizers, which suggests that Panhellenism was not yet so advanced for this type of collaboration to be deemed treasonous. If one's primary loyalty lay with one's city-state, Medism was more reflective of opportunistic alliance making than it was of collaboration.

Greek loyalty to the city-state was made evident in the Peloponnesian War (431-404 B.C.E.), fought between Athens and Sparta and their allies. According to Thucydides (c. 459-402 B.C.E.), the war began with an example of collaboration. A small Theban force was able to seize the town of Plataea when a local faction opened the gates at night, hoping to use the Thebans to kill off a rival faction and obtain power for themselves. In this case, collaboration came as the result of internal local politics, but it did not end

well for the plotters. When the Plataeans realized how few Thebans there were, they revolted and massacred the foreigners.

The Romans had stronger notions of collaboration. They used the legend of Tarpeia as a warning for potential traitors or collaborators. During the war with the Sabines, Tarpeia, the daughter of the commander defending Rome, let the Sabines into the citadel. According to one of the versions told by Livy (c. 59 B.C.E.-17 C.E.), Tarpeia demanded the heavy gold bands that the Sabines wore on their left arms as payment. Not willing to reward a traitor, the Sabines piled their shields—also worn on their left arms—upon the girl, crushing her to death.

In their later campaigns of expansion, the Romans actively sought the collaboration of local auxiliaries, especially in the form of cavalry, which they lacked. From the point of view of the collaborators, however, such acts did not constitute treason. Troops in auxiliary units were primarily loyal to their leader, who might well choose to ally with the Romans against other tribes for personal gain. Thus, Julius Caesar conquered Gaul with the help of other Gauls, but their tribal nature meant that, like the Greek Medizers, they were more allies than collaborators.

MEDIEVAL WORLD

The medieval period saw few developments in Western concepts of collaboration. Despite the bonds of chivalry, the feudal system ensured that loyalties remained at the level of the individual, between lord and vassal. Small armies serving for short periods of time on expeditions with limited aims provided little opportunity for large-scale collaboration. Hugh of Maine provides a typical example of medieval collaboration. In 1091, Hugh, a vassal of Matilda of Tuscany, informed the Holy Roman Emperor Henry IV of an impending attack, enabling the latter to defeat Matilda's forces at Tricontai.

Religious wars, such as the Crusades, provided the conditions for a broader range of collaboration, but religious motives often coalesced with personal and political ones. Armenian Christians supplied the Crusader armies besieging the Turkish-held city of Antioch in 1097. Their main intention, however, was to gain the Crusaders as allies in their attempt to break free from the Christian Byzantine Empire and form an independent kingdom in Cilicia. When Antioch fell to the Crusaders in 1098, it was with the help of an Armenian named Firouz, who served in the Turkish garrison but was disgruntled that the local emir had confiscated his wealth. Firouz opened the gates to the city, and other Armenian residents took part in the massacre that ensued against the Turkish population.

MODERN WORLD

The centralization of military and political authority in Europe that followed the 1648 Peace of Westphalia brought new perspectives on collaboration. These developments broadened the scope and ramifications of treason, especially for the nation-states that had risen by the nineteenth century. If primary loyalties were to be directed toward higher legal authorities and broader communities, collaboration with a clearly defined foreign power had greater significance than before. In addition, technological and organizational developments increased the geographic range of wars and public participation within them, creating new opportunities and the likelihood for more types of collaboration.

The age of revolution brought new, ideological motives for collaboration. Napoleon may never have taken his republican rhetoric seriously, but he actively used it to gain the collaboration of different national groups in his campaigns. His invasion of Italy in 1796 saw local radicals rise up against the ancien régime. Similarly, Napoleon's "liberation" of Poland won the support of some nationalistic Polish nobles, including Prince Józef Antoni Poniatowski (1763-1813), who would reach the rank of marshal in Napoleon's Grand Armée. Despite this, the French never attained the level of collaboration they desired within their occupied territories. Because of Napoleon's focus on the exploitation of these countries for the war effort, the reforms and independence desired by collaborators never materialized.

Napoleon's conquests were not equaled until World War II, which solidified modern notions of collaboration. Because so much of Europe and Asia was occupied, collaboration was widespread. Furthermore, because of the brutality represented by

Nazi expansion, this collaboration was imbued with moral connotations that have permanently attached themselves to the concept. For these reasons, World War II provides the best case study to categorize the various types of collaboration in the modern world and to explain the different motives behind them.

World War II introduced a new term for collaborators. During and since the conflict, collaborators came to be referred to as "quislings." The name of the Norwegian collaborator Vidkun Quisling (1887-1945) became synonymous with treasonous collaboration. Interestingly, though, one of the most famous collaborators in history was also one of the most inept. Quisling's Fascist-style National Union Party was politically irrelevant in 1939. Realizing that his only chance of success was through foreign help, Quisling lobbied the Germans to invade Norway. The Germans had their own reasons for an incursion into Scandinavia and initially wanted nothing to do with Quisling, whose value was limited by his lack of popularity. Nonetheless, with the fall of Oslo in April, 1940, Quisling committed the treasonous act of proclaiming himself head of a new Norwegian government. He was a complete failure. His efforts to Nazify the country only fueled resistance, and he never gained independence of command from the German occupation authorities. After the war, the Norwegian court convicted Quisling of treason, and he was executed by firing squad.

Other groups collaborated with the Nazis on ideological grounds, but without subordinating their ideas so completely to German chancellor Adolf Hitler's worldview. French marshal Henri-Philippe Pétain (1856-1951) signed an armistice with the Germans in 1940 and headed the collaborationist French government in Vichy partly out of defeatism and the conviction that he was saving France from an even worse fate. However, Pétain and other Vichy leaders also hoped to institute a patriotic national revolution in France to replace republicanism. Disaffection with the Third Republic had been fairly widespread before the war, which gave the Vichy regime some degree of popular backing until Hitler ordered the complete occupation of France at the end of 1942. Pétain's death penalty after the war was commuted to life imprisonment.

German and Italian occupation forces were able to use religious and ethnic divisions in the Balkans to their advantage, gaining collaborators to help administer and police the conquered territories. A fascist regime was established in Croatia, headed by Ante Pavelić (1889-1959), to free the Axis from the direct occupation of that country. When Pavelić's regime proved incapable of maintaining security against the communist-led partisan movement, the Italians had few qualms against using Orthodox Serbian Četniks as auxiliaries. The Četniks themselves were royalist or nationalist guerrilla fighters opposed to Axis occupation, but they saw communism as the greater evil. These examples demonstrate the frequently ambivalent nature of collaboration.

As the war progressed and partisan resistance became greater, local auxiliaries became increasingly important to Axis policies in occupied Europe. Large numbers were recruited in the occupied Soviet Union—far more, in fact, than the Soviet partisans themselves could muster—more out of the need to feed themselves and their families than out of support for the Nazis, who envisioned their eventual reduction to slavery. It was nonetheless this widespread form of collaboration that Europeans found most difficult to come to grips with after the war. Particularly disconcerting was the predominant role of local auxiliaries in the Holocaust. These forces, rather than German units, were frequently used in the rounding up and execution of Jews in Eastern Europe. As in previous eras, the most important motive behind collaboration during World War II was survival. Although collaboration was widespread, Hitler's ideological aims and overbearing nature ensured that it could never be total.

Collaboration remains an important goal of occupation forces in present operations, though for very different aims and in new ways. In Afghanistan, North Atlantic Treaty Organization (NATO) forces seek the cooperation of village elders in formulating reconstruction plans, thereby promoting the creation of democratic traditions at the local level. This type of collaboration faces the same challenge it did in previous times: the need to balance the aims of the occupier with that of the occupied. Collaboration has always been a two-sided affair.

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Nicolas G. Virtue

Genocide

Overview

Combining the Greek word *genos* ("race" or "tribe") with the Latin *cide* ("killing"), Raphael Lemkin (1900-1959), an obscure Jewish lawyer and refugee from Nazi-occupied Europe, coined the word "genocide" in 1944. Born near Wołkowysk (now Volkovysk) in the Białystok (Belostok) region of what was then Russian Poland, Lemkin—who developed an early fascination with state-sponsored mass atrocities and subsequently became a crusader for an international law to criminalize and punish what he initially characterized as "barbarity" and "vandalism"—defined genocide in his 1944 book *Axis Rule in Occupied Europe* as "the destruction of a nation or an ethnic group" via "a coordinated plan of different actions aiming at the destruction of essential foundations of the life of national groups, with the aim of annihilating the groups themselves." Though controversial from its birth, Lemkin's term was incorporated into the indictments prepared for the 1945-1946 Nuremberg trials of major Nazi war criminals. Moreover, in 1948, thanks in part to Lemkin's continuing efforts to make genocide a legal crime, the newly established United Nations adopted the Convention on the Prevention and Punishment of Genocide, which declared genocide a crime under international law; enumerated the acts (including murder, causing serious physical or mental harm to group members, intentionally inflicting conditions on groups designed to produce complete or partial destruction, imposing measures aimed at preventing births within groups, and transferring by coercion children from one group to another) that constituted genocide; and declared such acts to be punishable.

Significance

Building on more than a decade of research and writing on the Holocaust, serious scholarly study of genocide began in the early 1980's. Since that time, historians, political scientists, sociologists, and others have created a distinct field, commonly labeled "genocide studies," which has done much to broaden the world's knowledge and understanding of specific genocides throughout history, as well as to identify the contexts, including war, in which genocide has occurred. In fact, much scholarship argues that genocide and war are "Siamese twins" and therefore should not be treated as separate phenomena, as has frequently been the case. Ample evidence for this assertion can be found throughout history, as war, both international and civil, has time and again created circumstances and conditions that allow perpetrators opportunities to annihilate, either in whole or in substantial part, specific victim groups while facilitating their efforts to do so.

History of Genocide

The twentieth century has been characterized as "the century of genocide," with good reason. Several indisputable cases of genocide, as defined by Lemkin, the 1948 U.N. convention, and other sources—notably Nazi Germany's persecution and systematic mass murder of an estimated six million European Jews—date to the twentieth century. However, recent scholarship, specifically that which accepts a broader definition of the term and thus takes a more inclusive approach in identifying instances of genocide, argues that genocide was not exclusive to the twentieth century; that, in fact, it has occurred throughout history; and that examples, frequently intertwined with warfare, are to be found in the ancient world, the medieval world, and the pre-twentieth century modern world.

Ancient World

According to an increasing number of scholars, the Assyrians, a highly militaristic people native to north-

ern Mesopotamia, perpetrated genocidal acts during the first millennium B.C.E. Between 1000 and 665, while conquering a vast empire in western Asia, which included their Mesopotamian homeland, much of southern Asia Minor, Syria, Palestine, and Egypt, the Assyrians deliberately massacred entire populations, irrespective of age, gender, and physical condition, and conducted mass deportations, forcibly resettling conquered populations, either in whole or in part. Designed to warn those who might dare resist in the future and/or to eliminate those who had already resisted, the practices of mass murder and deportation—"ethnic cleansing," to use twentieth century terminology—were fundamental to the Assyrian way of war.

Other examples of genocide in the ancient world commonly cited by genocide scholars include atrocities committed by the Athenians against the population of Melos in the fifth century B.C.E. and by the Romans against the Carthaginians in the second century B.C.E. In the former case, Athenian forces captured Melos, an island located in the Sea of Crete, in 416 B.C.E., after which they killed all men deemed capable of bearing arms, enslaved the women and children, and introduced Athenian colonists. In the latter case, Roman military forces destroyed the North African city of Carthage in 216 B.C.E., killed an estimated 150,000 Carthaginians—of a total population of somewhere between 200,000 and 400,000—and poured salt into the land surrounding the city to destroy its arability. What is significant about these cases is that war served as the context for both. The Athenian actions, maybe best characterized as "gendercide," were triggered by Melos's refusal to ally itself with Athens, at that time involved in the Peloponnesian War (431-404 B.C.E.) against Sparta, while those of Rome came at the end of the Third Punic War against Carthage (149-146 B.C.E.) and should be seen as the Roman decision that there would be no fourth contest with their chief rival for dominance in the western Mediterranean.

Medieval World

During the medieval era, Christian Crusaders perpetrated mass slaughters that some scholars interpret as genocidal. Major targets and victims included Muslims, who were deemed infidels; Jews, who were held responsible for the crucifixion of Jesus; and those Christians who had accepted doctrines and taken positions labeled heretical by the Roman papacy. The First Crusade (1095-1099), launched by Pope Urban II (r. 1088-1099) for the ostensible purpose of reclaiming the Holy Land from the Seljuk Turks, witnessed some 100,000 Crusaders from across western Europe descend upon the Byzantine Empire, rout the Seljuks, and liberate the city of Jerusalem. During their trek to the east, the Crusaders massacred entire Jewish communities, especially those located in the German Rhineland, while in the aftermath of their victory at Jerusalem they put to the sword thousands of Muslims, Jews, and Christian heretics. More than a century later, Pope Innocent III (r. 1198-1216) initiated a crusade against the Albigensians (1209-1229), Christian sectarians in southern France who criticized the Catholic Church's material wealth, advocated clerical poverty, and called for the translation of the Scriptures into vernacular languages. Innocent III's forces destroyed the Albigensian heresy via the mass killing of the sect's adherents and the appropriation of their property for the Catholic Church.

Scholars also attribute genocide to the Mongols, who, after their unification by Genghis Khan (c. 1155 or 1162-1227) at the beginning of the thirteenth century, proceeded to conquer a vast Eurasian empire that stretched from the shores of the Pacific Ocean in the east to the banks of the Danube River in the west and included China, central Asia, portions of the present-day Middle East, the territories of Russia, and parts of eastern Europe. Like the Assyrians of the first millennium B.C.E., the Mongols made mass murder of entire populations—designed to terrorize future targets of attack and conquest into submission—an integral component of their way of war. Contemporary accounts, especially those pertaining to the Mongol conquest of the Russian principalities (1237-1241), paint a gruesome picture of the mass death and absolute devastation that accompanied the "Devil's horsemen."

Modern World

While evidence for genocide in both the ancient and the medieval worlds is circumstantial, highly prob-

lematic, and subject to differing interpretations, evidence for genocide in the modern world is far more conclusive, and thus scholars who investigate modern genocides stand on much firmer ground when they interpret specific cases of mass atrocity as genocide. However, the modern era has its share of so-called disputed, as opposed to denied, genocides, including the annihilation of indigenous peoples during the European conquest of the Americas (fifteenth and sixteenth centuries), the Atlantic slave trade (sixteenth to nineteenth centuries), the Committee of Public Safety's crushing of the Vendée uprising (1793) during the French Revolution, the "rubber terror" (1880's-1890's) of Belgian king Leopold II (r. 1865-1909) in the Congo Free State, the German suppression of the Herero revolt (1904) in southwest Africa, the Ukrainian famine (1932-1933), the Allied strategic bombing campaigns (including the atomic bombings of Hiroshima and Nagasaki) in Europe and Asia during World War II (1939-1945), and the ethnic cleansings conducted by the Serbs in Croatia, Bosnia-Herzegovina, and Kosovo (1991-1999) during the so-called Wars of Yugoslav Succession. What cannot be contested is that the twentieth century witnessed the leaders of the Ottoman Empire commit genocide against the Armenian population of the empire; the leadership of Nazi Germany perpetrate genocide against Europe's Jews and several other victim groups; Pol Pot (1928-1998) and the Khmer Rouge leadership of Cambodia carry out a genocide that targeted the country's ethnic minorities, Buddhist monks, and suspected political opponents; and the Hutu leadership and population of Rwanda engage in genocide against the Tutsi population of the country.

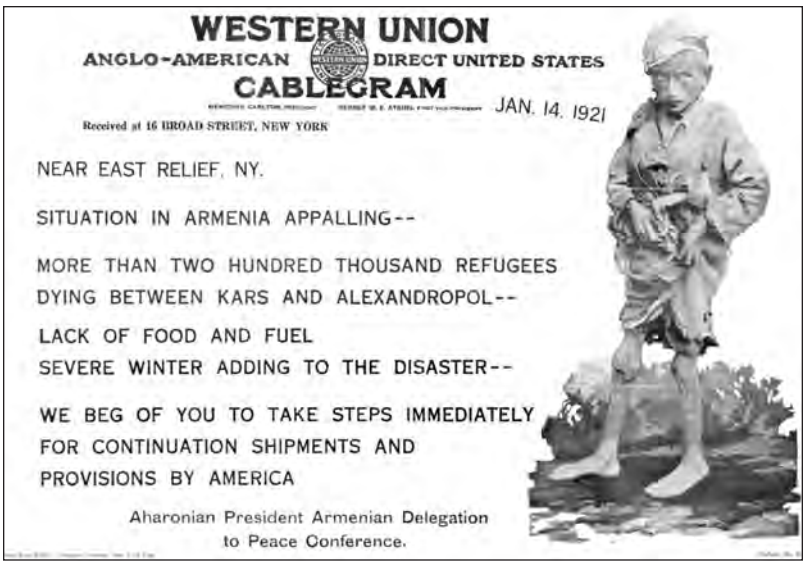
Getty Images

In 1492, countless Jews either were burned alive or expelled from Spain after refusing to convert to Christianity.

What is especially relevant is that in three of these cases—the Armenian genocide, the Nazi genocides, and the Rwandan genocide—war allowed the perpetrators to commit their premeditated crimes.

World War I (1914-1918), generally considered the first "total war," provided the background for the Armenian genocide of 1915, which produced the deaths of somewhere between 1 and 1.5 million people and which wiped out the Armenian communities of Anatolia and historic western Armenia within the Ottoman Empire. Perpetrated by the "Young Turks"—who had seized power in Istanbul in 1908 with the aim of saving the empire, the so-called sick man of Europe, which appeared on the verge of extinction—the assault against the Armenians involved the mass murder of the adult male population and the deportation, primarily by forced marches, of the women and children to the Syrian desert. Those among the Young Turks' leadership most culpable—minister of the interior Mehmed Talât Paşa (1874-1921), minister of war Enver Paşa (1881-1922), and minister of the navy Ahmed Cemal Paşa (1872-1922)—justified these harsh measures by accusing the Armenians of disloyalty and treason, claiming that they had collaborated with the Russian Empire, against whom the Ottomans were at war. In reality, however, the attempted destruction of the Armenian population of the Ottoman Empire must be understood both as the culmination of the escalating persecution of the Armenians that had begun during the reign of Abdülhamid II (r. 1876-1909) and as a component of the Young Turks' program to transform the empire into an homogenous Turkic state based on one people and one faith. War provided Talât and his associates the opportunity to resolve what he and others described as "the Armenian question."

Initiated by Nazi Germany and its fanatical leader Adolf Hitler (1889-1945)—who aspired to effect a global demographic revolution that would allow allegedly racially superior pure-blooded Germans, the so-called Aryans, to dominate the world—World War II (1939-1945) offered the führer and his associates the opportunity to eliminate those peoples deemed racially inferior, biologically defective, and politically and ideologically oppositional. Consequently, the Nazi regime murdered more than 200,000 mentally and physically disabled people (described as "life unworthy of life" and "unproductive eaters"), somewhere between 250,000 and 500,000 Sinti and Roma (labeled "asocial" and "racially inferior"), and several million Poles and Russians (characterized as "subhuman"). The chief targets and chief victims of German genocidal actions, however, were Europe's Jews, whom Hitler held responsible for Germany's defeat of 1918 and for the country's subsequent political and economic problems, and whom he saw as simultaneously the most inferior of races and the single greatest threat to the continued existence of the Aryans. Committing themselves to the "Final Solution of the Jewish Question" in 1941, and thus the physical elimination of the entire Jewish race, the Nazis, with help from collabora-



Library of Congress

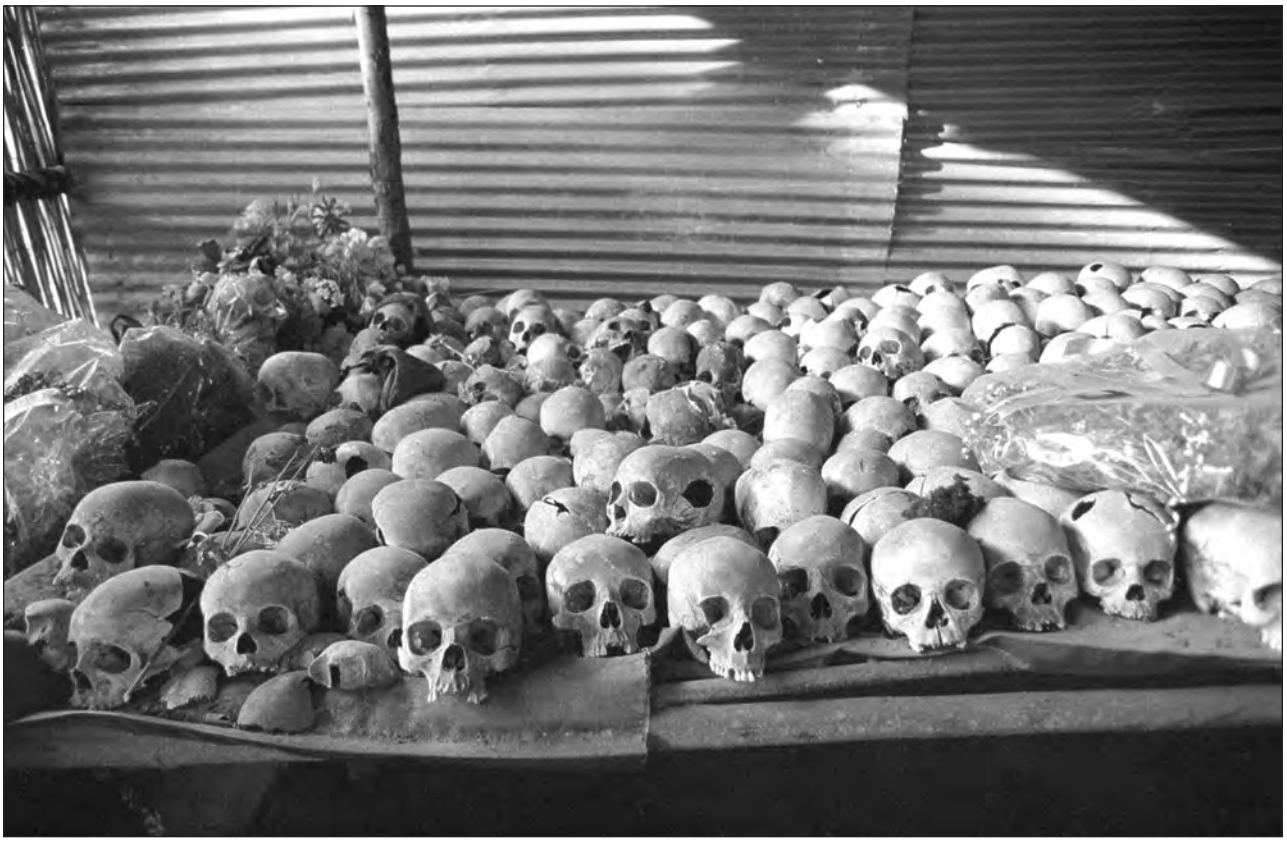
Threats to Armenian survival in Turkey continued long after the genocide of 1915; residents of the neighboring Armenian homeland faced new challenges when the Soviet Union was formed in the early 1920's, as shown by this 1921 appeal for American help.

National Archives

These starved prisoners died en route to the Dachau concentration camp, while they were packed like sardines in freight cars.

tors from across Europe, proceeded to murder, primarily by mass shootings and mass gassings conducted in specially established death camps, approximately two-thirds of Europe's Jewish population before the Third Reich's military defeat finally brought this genocide—characterized as "unique" by some, "unprecedented" by others—to a conclusion.

At the end of the century, civil war in the central African country of Rwanda served as the context for a genocide characterized by one expert as "in some ways without precedent." Beginning in 1990, the civil war pitted Paul Kagame's (born 1957) Rwandan Patriotic Front, a guerrilla organization formed by Tutsi refugees in Uganda that aimed at restoring Tutsi control in Rwanda, against the Hutu government of Juvénal Habyarimana (1937-1994). In April, 1994, less than one year after an uneasy peace, the Arusha Accords, had been negotiated, Habyarimana was killed when his plane was shot down as it approached Kigali airport. Although responsibility for Habyarimana's assassination remains unresolved, Hutu extremists in the late president's inner circle, the government, and the army—Colonel Théoneste Bagosora (born 1941) in particular—used the event



AP/Wide World Photos

In Rwanda, human skulls on display, many of which show evidence of deep gashes. The killings were the result of the 1994 Rwandan genocide, the mass murders of several hundred thousand Tutsis and Hutu political moderates by Hutus subscribing to the Hutu Power ideology.

to justify a final reckoning with the Tutsi and those Hutu who sympathized with them. Blaming the murder of Habyrimana on Tutsi rebels, the Hutu extremists unleashed the Presidential Guard, the army, and the notorious Interahamwe (Hutu militia) against the "cockroaches" and their supporters. What followed was a "hurricane of death" during which innocent men, women, and children were killed in the most brutal and barbaric of fashions. Though the Hutu perpetrators ultimately lost power when Kagame's forces seized Kigali in July and failed in their effort to exterminate the Tutsi population, they managed to murder somewhere between 800,000 and 1 million people, roughly 10 percent of Rwanda's population and 75 percent of the Tutsi population, in only one hundred days. As one scholar notes, "the daily killing rate was at least five times that of the Nazi death camps."

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Bruce J. DeHart

Mercenaries

Overview

Mercenaries are soldiers who serve not their own country, city-state, tribe, or clan but rather another group, purely for financial gain or other benefits. Most often (but not always), mercenaries are recruited and employed during wars and other conflicts. They can be found among the armies of organizations that lack the military manpower, popular support, or military technology to maintain a sufficiently powerful force drawn from the nation's own citizenry or the group's own members. The use of mercenaries is well documented in many wars throughout history.

Today, mercenaries face legal restrictions under international law: U.N. Resolution 44/34 prohibits the recruitment, training, and employment of mercenaries for purposes of overthrowing a government. Unlike the soldiers of the nation's own army, mercenaries are not guaranteed protection under the Geneva Conventions. Despite this, mercenaries can still be found on the battlefields of Africa and other areas where national political authority is in question and international scrutiny is limited or nonexistent.

Significance

Typically, the use of mercenaries rises during a period of constant warfare or during the declining years of a kingdom, empire, or country, when they are seen as a ready source of trained military manpower, but falls out of favor during periods of strong governments. Their employment carries political and operational risks, since their only loyalty is to money or plunder and thus that loyalty cannot be ensured when their compensation becomes unreliable during periods of hardship or in the face of heavy losses. Thus, mercenaries have thrived during periods of limited warfare and political instability but have suffered when those conflicts are settled or the political situation has stabilized to a point where concerns about the presence of these armed foreigners with uncertain loyalty outweighs that of potential defeat.

History of Mercenaries

Ancient World

The Egyptian Pharaoh Ramses II is the first ruler known to have hired mercenaries. He used some eleven thousand paid "auxiliaries" during his military campaigns in the fourteenth century B.C.E. Indeed, Egypt first started employing mercenaries as scouts and light infantry during the Old Kingdom and continued the practice through the New Kingdom period. Nubian, Syrian, and Canaanite light troops supported most of the Egyptian campaigns in the Levant, even serving as the Pharaoh's personal security detachment.

However, the best-known mercenaries of the pre-Roman era were those of Greece. Greek hoplites and Cretan archers served in the armies of Persia, Egypt, and even Carthage throughout the classical period. Alexander the Great included mercenary archers and Thracian infantry in his army. He also employed Greek mercenaries hired to remain with him for his Bactria and India campaigns after he sent the city-state contingents home. The Balearic Islands provided another source of mercenaries, primarily slingers, and the Nubian kingdom provided mercenary light cavalry units to the Egyptian and Carthaginian empires. Gallic tribesmen also hired out as mercenaries, constituting the bulk of Hannibal's army when he invaded the Italian peninsula.

The Roman Republic and early Roman Empire employed few mercenaries; even their auxiliary troops were considered part of the Roman Army and were recruited from among the empire's population, if not its citizens, although auxiliaries could earn citi-

zenship through their service. However, manpower shortages and political considerations drove the later Roman Empire and its Byzantine successor to recruit entire foreign mercenary contingents into their forces, the best known of which is Byzantium's Varangian Guard of Norsemen. Rome's employment of German tribes to man its army contributed to the empire's fall when the tribal contingents' leaders turned on Rome. Mercenary contingents followed leaders who could deliver pay or plunder.

MEDIEVAL WORLD

The so-called Dark Ages probably saw mercenaries serving under the more aggressive local leaders, who paid with plunder. William the Conqueror included Flemish mercenary archers among his troops when he invaded England in 1066. Crusading armies included mercenaries among their infantry and auxiliary forces. Virtually every kingdom in Europe and North Africa employed mercenaries from the eleventh to the nineteenth century.

Elsewhere, pre-shogunate Japan's fighting clans and the kingdoms of Southeast Asia employed mercenaries to reinforce their armies. The Nungs, an ethnic Chinese group spread across Indochina, served Annamese, Laotian, and Khmai kingdoms of Indochina. India's kingdoms also used mercenaries, and China's Ming Dynasty hired contingents of Manchu and central Asian horsemen to support its armies.

Lacking the resources to train and maintain standing armies, kings and emperors hired mercenaries as required. In Europe, this gave rise to "free companies," or military companies led by "captains of fortune," who hired out their troops for specific contractual periods and often to the highest bidder. Typically, the fighting was ritualized and tightly controlled, with troops fleeing when the battle's momentum turned against them. Trained soldiers were difficult and expensive to replace. Their captains often withdrew their units from the battle lines if they thought the risks were too great or their casualty rates became excessive. Despite this, mercenary companies prospered across Europe.

By the fifteenth century, some ethnic groups, cantons, and regions became known for their specialized mercenary forces. For example, the Flemish and Genoese were noted as crossbowmen, while England and Wales provided archers. Switzerland's pikemen were perhaps the most famous and popular mercenaries, dominating Europe's battlefields from the fifteenth to the seventeenth century. German principalities recruited and trained competing pikemen

Leonardo da Vinci's 1480 drawing of a condottiero *(literally, "contractor"), a mercenary soldier contracted by Italian city-states and the Papacy between the late Middle Ages and the mid-sixteenth century.*

U.S. Air Force

The World War II group known as the Flying Tigers were sometimes called mercenaries because they were private contractors fighting for a combination of monthly pay and a bounty for every Japanese plane they shot down. The fronts of their airplanes were painted to resemble sharks, as seen in the middleground.

companies called *Landsknechts*. Specially trained musketeers supported the pikemen as armies tried to balance the ratio of "firepower" and "shock" components of their forces. It was the combination of mercenary musketeers and pikemen that ended the mounted knights' reign over Europe's battlefields. However, musket and pike drill required great skill and intense discipline, something feudal levies and few royalist officers had the time, patience, or motivation to achieve.

MODERN WORLD

By 1750, up to two-thirds of Imperial France's army consisted of foreign mercenary contingents and as much as 20 percent of Britain's army was such. The German musketeers and riflemen were the most feared of those contingents, but their use in suppressing civil disorder generally proved counterproductive. In fact, British use of German mercenaries in the American Revolution turned many colonists against the Crown. Revolutionary France's use of mass levies of troops and Napoleon's adroit use of those forces all but ended Europe's large-scale employment of mercenaries. By 1830, France and Spain were the only countries utilizing foreign mercenaries in their armies, although Britain's East India Company employed mercenaries across what became colonial India. That practice, too, ended when India became a crown colony and the East India Company's military components were disbanded.

The rise of nationalism accelerated the decline of mercenaries in Europe, but civil wars in China, Central America, and South America inspired hundreds to hire out to political factions and in some cases try to become local warlords and rulers in their own right. Typically, mercenaries were hired for their technical expertise with specific weapons, such as machine guns and artillery. Mercenary pilots hired themselves out to China's warlords during the post-Republic civil war era, and both Ethiopia and China hired mercenary pilots to fight the Italians and Japanese, respectively, in the 1930's. In fact, General Claire Lee Chennault's famous Flying Tigers were mercenaries fighting for a combination of monthly pay and a bounty for every Japanese plane they shot down.

The post-World War II breakup of Europe's colonial empires provided many opportunities for mercenary employment as newly formed nations sought immediate military expertise either to suppress competing political movements or to secure disputed border areas. "White" mercenaries, so called because they were primarily Caucasian, fought in civil wars across Africa throughout the 1950's and into the 1980's. In some cases, they were successful in ending conflicts without excessive bloodshed, such as in the Congo in 1964, where South African mercenary Michael Hoare led a mercenary unit that worked in concert with Belgian paratroopers to rescue more than one thousand Europeans threatened by a rebel group called the Simba that had become notorious for murdering civilians. Separatist Biafra hired mercenary soldiers and pilots during the Nigerian Civil War (1967-1970), as did Southern Sudan when it tried to break away from the Arab-led regime in Khartoum during the first Sudanese Civil War (1955-1972). Postcolonial Angola saw one of its factions employ mercenaries during the struggle for power after the Portuguese withdrawal in 1974. Funded by the United States through its Central Intelligence Agency (CIA), the operation was a dismal failure, and six of the captured mercenaries were executed in 1976. This was followed later by the aborted mercenary coup in the Seychelles and two mercenary coups in the Comoros Islands, which were overthrown by the French military. The 1980's saw little mercenary activity in Africa, although several Middle Eastern countries hired foreigners for oil-field security and to maintain their high-technology military equipment.

The 1990's saw a resurgence in mercenary activity. Sierra Leone employed a private security firm, Executive Outcomes, to train its troops and suppress several insurgent groups. Although this effort was successful, political pressure from its African neighbors and concerns about the return of mercenary armies to the continent led Sierra Leone to cancel the contract in 1997. More recently and more controversially, in 2004 Zimbabwe arrested a group of sixty-seven mercenaries en route to Equatorial Guinea, where they reputedly were destined to support a coup attempt. Funded by unknown benefactors who allegedly included former British prime minister Margaret Thatcher's son Sir Mark Thatcher, the former South African soldiers were supposed to link up with local regime opponents and place opposition leader Severo Moto in power. Most were sent to prison, where they would await trial on various charges.

The day of mercenaries does not appear to be over, although the bulk of their service today is related more to training and maintenance than to direct combat roles. Private security, or military, companies (PMCs), such as Blackwater, DynCorp International, Executive Outcomes, and Sandline International, have deployed military specialists and security personnel to Afghanistan, Angola, Bosnia, Croatia, Haiti, Indonesia, Iraq, Kuwait, Sierra Leone, and Somalia. Although their industry is considered unsavory, as long as there is a need for specialized military expertise, mercenaries will find employment in areas were political sovereignty is unsettled and the outcome of a conflict is considered critical to someone willing to pay.

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Carl Otis Schuster

Peace Movements and Conscientious Objection to War

Overview

Peace movements are a loose assemblage of groups and individuals, often with dissimilar programs but in accord on seeking to reduce conflict or end war by achieving some change in foreign policy. Conscientious objection, termed pacifism in 1901 by the French war opponent Émile Arnaud, can be either the absolute renunciation of war or the opposition in principle to a specific war or governmental program on religious, philosophical, humanitarian, or social-justice grounds. Current historiographical trends include conflict management, which involves writings focused on achieving peace through negotiation, mediation, arbitration, international law, and arms control and disarmament; social reform, which involves writings seeking to change political and economic structures and ways of thinking; and world order transformation, which involves writings on world federation, better economic and environmental relationships, and a common feeling of security.

Significance

Peace movements and conscientious objection are significant concepts in relation to the overall understanding of military conflict and the nature of warfare because of the fear of global annihilation. Estimates put the total number of people killed by organized violence in the twentieth century, both military and civilian, between 167 million and 188 million. This would calculate to be roughly five thousand lives lost every single day for one hundred years. The goal of those engaged in peace efforts is to eliminate or at least restrict armaments, conscription (draft), nuclear proliferation, imperialism, racism, and war itself. Peace movements and pacifists are also part of a social-reform movement, presenting alternatives to the policies they oppose, which call for the elimination all forms of structural violence resulting in death and oppression.

History of Peace Movements and Conscientious Objection

Ancient World

In the ancient world, international relations did not exist. Greek city-states coexisted in a casual manner, moving between hostilities and calm without much distinction. Every four years, ongoing hostilities were interrupted by a truce prohibiting Greeks from making war. The establishment of the Olympic Games was a by-product of this truce. Perhaps the first to secure lasting peace was the Amphictyonic League. City-states that joined agreed not to wage war with one another or cut off another's water supply. The Peloponnesian Wars (431-404 B.C.E.), moreover, generated strong sentiments for peace among the citizens of Athens and Sparta.

In ancient Rome, however, conquest and domination was a way of life. During the first few centuries C.E., Christians were persecuted for refusing to serve in the Roman legions. The early Christian church considered military service as "idolatry" and taught that the renunciation of arms was part of the teachings of Jesus. In the ancient world, though, the idea of peace rarely passed beyond the stage of individual thought and was never an organized endeavor.

Medieval World

During the Middle Ages, the Roman Catholic Church attempted to limit war among Christians on the European continent. Two religious doctrines prevailed in the name of peace: the "Truce of God," which forbade warfare on Sundays and "holy days" (from

which derived the modern term "holidays"), and the "Peace of God," which prohibited combat in certain holy places. However, one must not overlook the Church's promotion of the Crusades and the prosecution of "just wars" as conveyed in the fifth century by Saint Augustine in his *De civitate Dei* (413-427; *The City of God*, 1610) and later adapted and explicated upon by Saint Thomas Aquinas in his thirteenth century treatise *Summa theologiae* (c. 1265-1273; *Summa Theologica*, 1911-1921).

The appearance of traditions of absolute pacifism took place during the latter Middle Ages and the Reformation. These traditions were marked by a very strong antistate attitude. The Waldensians in the twelfth century and the sixteenth century Anabaptists were opponents of organized rule and vigorously persecuted by the Catholic Church and the state. The Anabaptists—Mennonites, Moravians, Dunkers, and later the Church of the Brethren—were entirely German-speaking from Central Europe and based their doctrine of nonresistance on what they called *Wehrlosigkeit*, which meant renunciation of war and refusal to participate in politics.

MODERN WORLD

The historical origins of peace movements as they are known today began during the Thirty Years' War (1618-1648) in Europe. The gradual formation of nation-states, along with the development of professional armies in support of European monarchs, led some thinkers to question the desirability of society's militarization. One of the first European thinkers to question the need for large standing armies was the Dutch jurist Hugo Grotius (1583-1645). Witnessing the expansion of large armies on the continent that far outnumbered his native population, Grotius wrote *De jure belli ac pacis* (1625; *On the Law of War and Peace*, 1654). Although he recognized the prospects for international war, his work was the first to draw a sharp distinction between what was war and what was peace.

Later in the seventeenth century, pacifist sects relying on religious grounds of conscientious objection transplanted their beliefs in the New World. The best-known American sectarian peace group was the Society of Friends (originally founded in England by George Fox around 1650). Led by William Penn, who won a large tract of land from the king of England and called his settlement Pennsylvania in the 1680's, the Friends (Quakers) believed that civil authority should flow directly from the power of the people's experience of "inner light" (direct personal knowledge of the good). What drew them together were their common hatred of war and violence, belief in nonresistance as a way of life, and love for Christ. One of the most famous proponents of Quaker pacifism was the eighteenth century Friend from Mount Holly, New Jersey, John Woolman, who preached against slavery and criticized raising taxes for war purposes. During the American Revolution (1775-1783), Quakers made conscientious objection (later known as passive nonresistance) an effective philosophical instrument.

Meanwhile, in Europe, at the end of the eighteenth century, one of the most important philosophical contributions to the principles of peace appeared. In *Zum ewigen Frieden: Ein philosophischer Entwurf* (1795; *Perpetual Peace: A Philosophic Essay*, 1897), German philosopher Immanuel Kant (1724-1804) laid the empirical groundwork for examining the necessary conditions for peace. Kant focused specifically on the dangers of armaments. He also argued that as society advances, reason and logic will further moral perfection. A product of the eighteenth century Enlightenment, Kant insisted that universal truths are independent of time and place, and because of humanity's ability to utilize rational principles, certain fixed principles, such as peace, will eventually prevail.

At the conclusion of the War of 1812 and the end of the Napoleonic conquests on the European continent in 1815, the first organized peace movements were formed in the United States and Great Britain. In the United States, an organized endeavor that was both religious and humanitarian, but not specifically tied to any one sectarian group, emerged under the leadership of New England sea captain and Harvard graduate William Ladd (1778-1841). Perhaps the world's first national peace organization, the American Peace Society coordinated activities among the fifty or so peace groups. In England, the London Peace Society led the way, composed mainly of Quakers. On the European continent, moreover, the ideas

for the establishment of permanent arbitration tribunals and a federation of nations advocated by thinkers such as Pierre Dubois (c. 1255-c. 1312) and the Abbé de Saint-Pierre (1658-1743) were widely popularized. The Holy Alliance of Czar Alexander I also seemed to be an indication that such ideas might be workable. In large measure, nineteenth century organized peace movements were products of the United States and Great Britain and would remain so for much of the twentieth century as well.

One of the most important advocates of peace during this period was the "Learned Blacksmith" from Connecticut, Elihu Burritt (1810-1879). During the Oregon Crisis between Britain and the United States in the mid-1840's, Burritt cooperated with Friends and other peace activists in England in an exchange of "friendly addresses." This exchange was carried out between British and American cities and involved merchants, ministers, laborers, and women. Burritt himself carried two "friendly addresses"—with impressive lists of signatures—one from Edinburgh, Scotland, and another from women of Exeter, England, to Washington, D.C., where Senator John C. Calhoun and other senators applauded this "popular handshaking" across the Atlantic. In addition, Burritt founded the largest and most uncompromising nonsectarian pacifist organization yet known among Western peace seekers: the League of Universal Brotherhood. By 1850, this "world peace society" had collected seventy thousand British and American signatures for its pledge of complete disavowal of war.

In the aftermath of the American Civil War (1861-1865), European peacemaking efforts had a profound impact on the American quest to eliminate war. Attempts to promote the importance of international law in Europe occurred roughly at the same time that the American Peace Society began widespread propaganda for arbitration. Sir Randal Cremer (1828-1908), a tireless British peace advocate and labor organizer who was instrumental in furthering Anglo-American arbitration negotiations, organized a vast peace congress in Paris in 1878. With spokespersons from thirteen countries, this congress called for a court of arbitration and for an international commission to estimate the armaments of each nation. The congress placed emphasis on the cost of wars to workers and the need for strike action to prevent war, proposing that the peace societies in various countries be federated. Subsequently, Cremer and Frédéric Passy (1822-1912) of France established the Inter-Parliamentary Union in 1889, and their efforts led to the Lake Mohonk Conferences on International Arbitration in the United States (founded 1895). The work of European and American arbitrationists and internationalists led to the creation of 130 new international nongovernmental organizations in the last quarter of the nineteenth century—and, as peace historians have pointed out, to the very term "international organization."

Antidraft riots in New York City in 1863.

During these same years, inspired by the movement for international arbitration, European peace activists also created their own international network. Though not organized as peace movements the way they were in Great Britain and the United States, peace societies sprang up in France, Italy, Germany, Belgium, Denmark, Sweden, Norway, and even czarist Russia, thanks in large part to Count Leo Tolstoy (who would become most famous for his novel *Voyna i mir* [1865-1869; *War and Peace*, 1886]). In 1892, peace societies created the International Peace Bureau in Bern, Switzerland, as a clearinghouse for publicizing their differing philosophies. Until 1914, peace workers lectured throughout the Continent, wrote books and pamphlets criticizing military expenditures, developed peace curricula for schools, and held meetings nearly every year, at which peace resolutions were submitted to foreign ministries.

The movement for international arbitration also became widely popular in the United States at the start of the twentieth century. Among the most influential organizations were the American Society of International Law, the Carnegie Endowment for International Peace (CEIP), and the World Peace Foundation (WPF). These organizations were specialized agencies for transmitting the experts' knowledge of peace to the masses and encouraging conciliatory gestures among governments. At the same time, the Hague Peace Conferences of 1899 and 1907 created the hope that disarmament and arbitration would end wars forever.

The outbreak of World War I in 1914, however, presented serious challenges to the rights of conscientious objectors as well as the two major organized peace movements. In Great Britain, Edward Grubb (1854-1939), a theologian, Friend, and social reformer, played a prominent role in establishing the No-Conscription Fellowship (NCF). The NCF waged a vigorous battle in its efforts to protect the right of conscience and in breaking down barriers separating religious and nonreligious war resisters. Largely through Grubb's efforts, the British government reexamined its views on the treatment of war resisters and absolute pacifists, adopting an entirely new policy that recognized their legal rights to exemption from state service.

During the war, the National Peace Council (NPC) served as the arm of the peace movement in England and the most recognizable peace organization in Europe. Founded in 1908, the NPC was a coalition of voluntary organizations that acted as a check on the government's attempt to militarize the populace and stifle dissent. The NPC encouraged an end to the conflict and looked forward to the establishment of some type of international peacekeeping organization. After the war, moreover, the establishment of the Peace Pledge Union in the 1930's secured numerous adherents to its pledge: "I renounce war and will never support or sanction another."

In the United States, the administration of President Woodrow Wilson respected the rights of the historic peace churches. However, nonreligious war resisters received harsh treatment and imprisonment. Many were beaten and placed in strip cells at federal prisons such as Alcatraz and Fort Leavenworth. Those found guilty of violating the Selective Service Act went to prison. When findings with respect to the treatment of imprisoned war objectors became public, President Wilson issued an executive order requiring the elimination of such harsh penalties.

The organized peace movement in the United States became divided between liberal internationalists who supported the war and pacifists who opposed it. Ultimately, this division resulted in a reorganized peace movement that would be led by groups such as the religious Fellowship of Reconciliation (originally founded in England in 1915 but establishing headquarters in the United States after World War I), the Women's International League for Peace and Freedom (the first American female to receive the Nobel Peace Prize, Jane Addams, was a member), the War Resisters League, and the American Friends Service Committee. These new organizations were born during and immediately after the war and considered peace as something more than the absence of armed conflict. Their creation defined the "modern" peace movement in America.

The leading peace advocate of the "modern" movement during this period was Abraham J. Muste (1885-1967). Labeled "America's No. 1 Pacifist" by *Time* magazine in 1939, Muste elevated peace action and connected it to labor and economic issues. His

form of nonresistance would later inspire a peace strategy known as direct action. Muste played a prominent role in the Christian nonviolence movement in twentieth century America and, with the Fellowship of Reconciliation, established effective relationships with peace societies in Europe, East Asia, and South Africa.

By the late 1930's, as fascism and militarism took hold in Europe, organized peace movements—still located in Britain and the United States—once again split apart. Devoted pacifists opposed the use of arms, while internationalists considered the defeat of German chancellor Adolf Hitler and Japanese aggression a necessity for establishing world order. Unlike Great Britain, which had come to grips with the issue of conscientious objection, the United States required some form of alternative service to bearing arms. A Civilian Public Service camps program was established and paid for by the Historic Peace Churches. Still, this approach did not satisfy absolute pacifists, and the controversy continued for the duration of the war.

NARA

A young woman offers a flower to a military policeman at the Pentagon during an anti-Vietnam War demonstration in 1967.

After World War II (1939-1945), the reality of atomic and then nuclear warfare, highlighted by the Cold War, led to the establishment of new peace groups in the United States, such as the Committee for a SANE Nuclear Policy, as well as disarmament groups on the European continent such as Great Britain's Direct Action Committee, which sponsored the annual Aldermaston marches. These peace organizations were committed to halting aboveground nuclear testing and encouraged disarmament talks between the principal nuclear powers. In addition, both the success of the nonviolence movement of Mohandas K. (Mahatma) Gandhi in India and antinuclear awareness promoted by the *hibakusha*, Japanese survivors of Hiroshima and Nagasaki, influenced the peace movement's role in Third World countries.

The most dramatic peace protests of the twentieth century took place in the United States during the Vietnam War (1961-1975). Massive antiwar demonstrations frequently took place in major cities, and direct action strategies were carried out to disrupt the machinery of government. Opposition to the war was widespread on college campuses. To a considerable extent, the antiwar movement was fueled by resentment over the draft as many young men questioned the legitimacy of the war. As a result, U.S. Supreme Court decisions gave wider latitude to the meaning of conscientious objection and no longer adopted a rigorous policy of alternative service.

The 1980's witnessed the peace movement in the United States and on the European continent calling for a freeze on the deployment of missiles and halting development of more nuclear warheads. What provoked such a sharp response was the growth of antinuclear movements in Western Europe. In 1981, massive protests were carried out in various Western European cities aimed at stopping a plan by the North Atlantic Treaty Organization (NATO) to deploy intermediate-range nuclear missiles in five European nations. Major demonstrations were conducted in Paris, Rome, London, Amsterdam, Brussels, and Bonn. British historian and left-wing social critic E. P. Thompson (1924-1993) became the leading intellectual light of the movement against nuclear

weapons. He rallied the British peace movement and took the lead in numerous Aldermaston marches. His writings also inspired American pacifists, who initiated a series of direct action campaigns aimed at defense plants, submarine bases, missile sites, and the Pentagon. In America, moreover, scientist Randall Caroline Forsberg (1943-2007) led the way in calling for a nuclear freeze.

In June, 1982, the movement for a nuclear freeze was dramatically illustrated at a disarmament rally in New York City. More than 700,000 people participated, making it the largest political demonstration in U.S. history. The campaign's grassroots impact was enormous as the freeze referendum appeared on state ballots across the nation. "It represented," in the words of one reporter, "the largest referendum on any issue in American history; sixty per cent of the voters supported the resolution." Although the freeze movement did not achieve its ultimate goal, the antinuclear arms movement did result in a change in attitude, both at home and abroad. It provided a badly needed political platform in support of arms control and disarmament.

The wars in Iraq and Afghanistan that began after the terrorist attacks of September 11, 2001, have also witnessed massive antiwar demonstrations. Among the salient aspects of this peace movement have been the sheer size of protests and its global scale. Prior to the commencement of military action in Iraq in 2003, peace demonstrations were larger than those that opposed the Vietnam War at its height. One of the unique aspects of this peace movement, particularly in the United States, has been its online organizing, which has helped many antiwar groups succeed in their efforts to mobilize at the grass roots. This peace movement has emerged as a force for organizing,

Getty Images

In San Francisco, people of all ages demonstrate against the imminent U.S. invasion of Iraq in 2003.

raising money, and influencing politicians and the media through blogs and e-mail messages. Using conference calls and e-mail messages to the U.S. Congress are new weapons for these protest movements, as peace workers aim to influence votes rather than gather in mass demonstrations.

Thus, the peace movement that emerged after 9/11 has embraced the notion of advancing international collective political struggles in novel as well as traditional ways. The interconnectedness associated with globalization and new communication technologies has elicited new opportunities to forge a global collective identity. No longer are organized peace movements primarily the domain of the United States and Great Britain alone. While military theorists believe that the future of warfare will revolve around social and communication networks worldwide, antiwar groups are demonstrating that theory as they get out the message of peace and justice.

One of the most important developments involving the issue of conscientious objection is that governments have moved away from a strict interpretation of "conscience" based on religion to a more secular understanding of people's views regarding a particular war. With respect to peace movements, it is safe to say that their importance has grown globally in size and stature, given the realities of modern warfare and the possibilities for nuclear annihilation. No longer are peace movements confined to nations composed of traditional peace societies and organizations. While peace movements, historically, may not have been effective in preventing all wars, it is clear that they have been responsible for informing publics as to the destructiveness of modern warfare.

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Charles F. Howlett

Prisoners and War

Overview

The four Geneva Conventions of 1949 and their Protocol I of 1977 constitute the legislation covering the protection of war victims. "Lawful combatants" who fall into the hands of the enemy either because they surrender or because they are wounded, sick, or shipwrecked have entitlement to the status of prisoners of war. The capturers must intern them in prisoner-of-war camps, which must be located far from the combat zone. The capturers must hold prisoners in good health and treat them humanely. Prisoners also have a set of rights, which the Third Geneva Convention spells out in detail—for example, against violence, intimidation, or insult.

Significance

The recognition of individuals having rights as prisoners of war has evolved along with the changing nature of warfare and more broadly with the recognition and development of universal individual human rights.

Library of Congress

Indian prisoners are marched away from their homeland by U.S. troops under the command of General George Custer. The U.S. warfare against and removal of Native Americans throughout the nation constituted one of the most shameful legacies of American history.

HISTORY OF PRISONERS OF WAR

ANCIENT WORLD

Economies of the classical world had slave labor as their basis. A person's wealth and status typically corresponded to the number of slaves he or she owned. Prisoners constituted booty from war and had value as such; they were considered loot and became chattel. Prisoners were therefore kept alive because they were valuable, but they had no rights. They were tools with voices.

MEDIEVAL WORLD

The chivalric code in feudalism was a system of rules regulating behavior between the nobility, including their treatment as prisoners of war. Nobles captured in battle were valuable hostages who could be ransomed by their fiefdoms. The members of lower social orders captured in war who had no access to economic resources for their own ransom therefore had no rights, were a burden, and were treated as such.

MODERN WORLD

Until the modern era, the devices available for mutual enforcement of the traditional laws of warfare included "belligerent reprisals" (a reprisal is a breach of international law by one state in return for another breach). This barbaric instrument included maltreatment of prisoners of war. Belligerent reprisals against prisoners of war and innocent civilians are now universally illegal but still frequently occur.

Article 4 of the Third Geneva Convention relative to the treatment of prisoners was ratified in Geneva, Switzerland, on August 12, 1949, and entered into force generally on October 21, 1950. It defines "prisoners of war" as persons belonging to one of the following categories, who have fallen into "the power of the enemy":

> (1) Members of the armed forces of a Party to the conflict as well as members of militias or volunteer corps forming part of such armed forces.
>
> (2) Members of other militias and members of other volunteer corps, including those of organized resistance movements, belonging to a Party to the conflict and operating in or outside their own territory, even if this territory is occupied, provided that such militias or volunteer corps, including such organized resistance movements, fulfill the following conditions: (a) That of being commanded by a person responsible for his subordinates; (b) That of having a fixed distinctive sign recognizable at a distance; (c) That of carrying arms openly; (d) That of conducting their operations in accordance with the laws and customs of war.
>
> (3) Members of regular armed forces who profess allegiance to a government or an authority not recognized by the Detaining Power.
>
> (4) Persons who accompany the armed forces without actually being members thereof, such as civilian members of military aircraft crews, war correspondents, supply contractors, members of labour units or of services responsible for the welfare of the armed forces, provided that they have received authorization from the armed forces which they accompany, who shall provide them for that purpose with an identity card similar to the annexed model [*sic*].
>
> (5) Members of crews, including masters, pilots and apprentices, of the merchant marine and the crews of civil aircraft of the Parties to the conflict, who do not benefit by more favorable treatment under any other provisions of international law.
>
> (6) Inhabitants of a nonoccupied territory, who on the approach of the enemy spontaneously take up arms to resist the invading forces, without having had time to form themselves into regular armed units, provided they carry arms openly and respect the laws and customs of war.

According to legal scholar Antonio Cassese, in its decision in the case of *Kupreskic et al.* the International Criminal Tribunal for the former Yugoslavia (ICTY, 2000) restated, and the international community widely accepts, that the 1949 Geneva Conventions lay down universal, international community obligations. Article 1, which is common to all four Conventions, obliges any state "contracting Party" to the Geneva Conventions "to respect and ensure respect" for the Conventions "in all circumstances." All states are under obligation to demand cessation of serious violation of the Conventions, as well as to demand punishment of the culprits, even if not directly engaged as belligerents in the conflict.

Other forms of "grave breaches" of the laws of warfare in the Geneva Conventions include refusing quarter to peoples wanting to surrender, the use of weapons that international law prohibits, and the torture of captured enemies in order to obtain information. Typically only international tribunals or the national jurisdiction of the adversary prosecutes systematic, grave breaches, also called "system criminality."

The Conventions institute the requirement that the countries that have signed on to the Conventions, known as states parties, act to repress systematic criminality occurring anywhere. This instrument involves the condemnation of an entire system of government for misbehavior involving the highest authorities in place in a country. No state legal system used this legal instrument until forty years after it came into force. States parties began resorting to it subsequent to the work of the ICTY and the International Criminal Tribunal for Rwanda in the 1990's. Still, national courts have refrained from claiming universal jurisdiction over systematic violations of the Conventions regarding treatment of prisoners of war, wherever they occur. They have confined themselves to the more traditional, territorial forms of their jurisdiction in practice for prosecuting grave breaches of the Geneva Conventions, using universal jurisdiction only if the state of a court had enacted national legislation that allows it.

The development of traditional international law historically shows that the interest of the Great Powers has been to exclude from the category of "lawful combatants" any person who is not a member of a regular army. Since the second half of the twentieth century began, the Great Powers have fought numerous "brushfire" wars, where their large, professional, standing armies invade a smaller country, usually defended by "irregular" or "insurgent" forces. During the nineteenth century, small and medium-sized powers demanded international legal concessions to recognize the role of militias and volunteer corps, as well as for the entire civilian populations, as lawful combatants. They thereby succeeded in preventing the Great Powers from obtaining sovereign rights over the territory the Great Power had invaded, since control of the territory was often still contested by an irregular, but legally recognized, fighting force.

This compromise granted the status of lawful combatant not only to regular armies but also to militias and volunteer corps. For combatants from a *levée en masse*—those who spontaneously take up arms to resist an invading army without the time to organize themselves—only two conditions are necessary to be a lawful combatant and therefore to hold rights as a prisoner of war: (1) to carry arms openly, and (2) to respect the laws and customs of war, including clear visible differentiation of military personnel from the civilian population.

Until World War II, mainly regular armies fought wars. In 1949, the Third Geneva Convention added in Article 4.A.2 a new category of irregular, lawful combatant holding the right to prisoner-of-war status: partisans, that is, "organized resistance movements, belonging to a party to the conflict and operating in or outside their own territory, even if this

U.S. Department of Defense

A U.S. POW is interrogated by a North Vietnamese officer in 1973, during the Vietnam War.

AP/Wide World Photos

An Iraqi POW at Abu Ghraib prison in Baghdad was forced to stand on a box, arms outstretched, in one of several cases of abusive treatment later litigated under the Uniform Code of Military Justice.

territory is occupied"; partisans must have a direct link to a party in the conflict.

The legal debate over irregular, guerrilla fighters became particularly important after 1949, with the rise of guerrilla warfare within the framework of interstate wars or wars of national liberation. The debate led the 1974-1977 Geneva Convention negotiations to adopt a compromise formula: The combatants also "are obliged to distinguish themselves from the civilian population while they are engaged in an attack or in a military operation preparatory to an attack" (Article 44.3, first sentence). This formula relaxes the "distinction from civilians" requirement, instead allowing the mere wearing of an insignia or any outward token, along with the open carrying of weapons, to signify combatant status. These requirements can be met either during or immediately prior to an attack. If combatants fail to fulfill the insignia or weapons-bearing requirement, they are still entitled to prisoner-of-war treatment, but they become vulnerable to punishment for violating Article 44.3.

The 1977 protocol relaxed these requirements further with regard to such situations as "wars of national liberation" and "military occupation." In these situations, the second sentence of Article 44.3 requests only that a combatant carry arms openly "(a) during each military engagement, and (b) during such time as he is visible to the adversary while he is engaged in a military deployment preceding the launching of an attack in which he is able to participate." If combatants are not satisfying the second sentence of Article 44.3, and the opposing forces capture them in the course of a war of national liberation or in territory under occupation, they then forfeit their status of lawful combatants and therefore cannot enjoy prisoner-of-war treatment. Therefore, someone who hides a gun and draws it to fire on occupying soldiers loses prisoner-of-war status if he or she was, in fact, part of a military operation. If the combatant is a disguised, failed suicide bomber as part of a planned military operation, then he or she also logically loses prisoner-of-war status. By contrast, if the combatant acted spontaneously and on his or her own, then he or she still receives prisoner-of-war status.

The adoption of Article 47 at the Geneva Conference (leading to the 1977 Protocol) constituted official recognition in paragraph 1 that "a mercenary shall not have the right to be a combatant or a prisoner of war." The definition of prisoners of war came under challenge with the development of the concept of "unlawful combatant" to refer to irregulars who refuse to wear identification markers or who openly carry weapons in order to identify and differentiate themselves from the civilian population. As a result,

the claim of the U.S. government during the administration of President George W. Bush was that such prisoners did not have prisoner-of-war status under the Geneva Conventions. Granting this status would also imply granting political recognition to the political authorities on behalf of whom they were agents. To ensure that they were not subject to U.S. legal state responsibility to adhere to the Geneva Conventions in their treatment, many were interned at Guantánamo Bay, Cuba, to keep them outside U.S. territorial legal jurisdiction.

For the purpose of safeguarding their interests and impelling adversaries to abide by international law, including treatment of their prisoners of war, the 1949 Geneva Conventions codified and improved on international practice with regard to the designation of "Protecting Powers" by belligerents for ensuring humanitarian treatment of their prisoners. Traditionally, each of the belligerents could appoint a third state as a Protecting Power, but the consent of both belligerents was necessary. An advance of the 1949 Convention was in the provision for "Substitutes for the Protecting Powers," declaring that the Detaining Power (the state detaining the enemy wounded, shipwrecked, prisoners of war, or civilians) is under the obligation to accept "the offer of the services of a humanitarian organization, such as the International Committee of the Red Cross, to assume the humanitarian functions performed by Protecting Powers under the present Convention."

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Benedict E. DeDominicis

War Crimes and Military Justice

Overview

Humans have committed war crimes against one another since wars were fought with clubs and stones, and for centuries war crimes were accepted as part of the horrendous price of waging war. As war evolved, so did a body of treaties and laws that sought to regulate the treatment of soldiers and civilians involved in war. The Hague Conventions were international treaties negotiated at the First and Second Peace Conferences at The Hague, Netherlands, in 1899 and 1907, and were, along with the Geneva Conventions, among the first formal statements of the laws of war and war crimes in international law. Article 147 of the Fourth Geneva Convention defines war crimes as:

> Willful killing, torture or inhuman treatment including . . . willfully causing great suffering or serious injury to body or health, unlawful deportation or transfer or unlawful confinement of a protected person of the rights of fair and regular trial, . . . taking of hostages and extensive destruction and appropriation of property, not justified by military necessity and carried out unlawfully and wantonly.

International lawyers stipulate that this is the basic definition of war crimes.

Since war crimes are associated with war, military tribunals or military commissions are used to try people in military custody or those accused of violating a law of war. Courts-martial generally have jurisdiction over members of their own military. Military tribunals usually provide quick trials under the conditions of war, but critics say these trials occur at the expense of justice. Military tribunals do not satisfy most protections and guarantees of the U.S. Bill of Rights, but many presidents of the United States have used them and Congress has authorized them.

Significance

World War II brought sweeping changes to populations and places and new definitions and understandings of war crimes. This global conflict transformed the concept of war crimes, necessitating a practical means of defining them and determining the punishments for them. Chief among the reasons for this transformation were the Nazi murders of seven million people, mainly Jews, and the Japanese murders and mistreatment of both civilians and prisons of war. The Allied powers prosecuted the Nazis for their war crimes at the Nuremberg Trials in 1945 and 1946, and twelve Nazi leaders were executed as a result. Japanese perpetrators were also tried, in Tokyo in 1948, and seven Japanese commanders were hanged, although Japanese emperor Hirohito was excluded from the prosecutions.

The idea that an individual can be held responsible for the actions of a country or that nation's soldiers is the core concept of war crimes. Genocide, crimes against humanity, and mistreatment of civilians or combatants during war all fall under the category of war crimes, with genocide being the most severe of these crimes. The trials at Nuremberg and Tokyo set the precedents for the cases that the modern-day tribunal in The Hague hears.

Since World War II, the issue of war crimes has become even more pressing with the outbreak of smaller wars all over the globe. The United Nations established tribunals to try crimes against humanity in the former Yugoslavia and in Rwanda. The U.S. Senate, on March 13, 1998, unanimously passed a resolution urging the United Nations to create a tribunal to indict and try Saddam Hussein as an international war criminal for "his crimes against humanity." Congress also passed the War Crimes Act of 1996, which defines and punishes offenses against the law of nations and violations of both the Geneva and Hague conventions. This U.S. law granted juris-

diction over these war crimes to federal district courts but did not intend for the act to override the long-standing jurisdiction of American military commissions and general courts-martial over war crimes.

History of War Crimes and Military Justice

Ancient World

The ancient world did not have a codified definition of war crimes. The nature of warfare guaranteed that war crimes were committed in almost every war fought, and both religious and civil leaders were often guilty of war crimes, at least by their modern definition.

The Massacre of Thessalonica provides one example. In 390 C.E., the citizens of the Greek city Thessalonica rose in revolt against the ruling Romans, and Emperor Theodosius I took immediate action. The flash point of the uprising occurred when Botheric, a Gothic general in the emperor's army, ordered a popular charioteer arrested for trying to seduce a servant of the emperor or the general himself. The charioteer went to prison, but the citizens of Thessalonica demanded his release. In the following chaos, Botheric was killed, and then the emperor intervened and ordered executions. The emperor's intervention came too late, and angry Gothic troops massacred seven thousand people in Thessalonica's hippodrome.

This event exemplifies issues that modern theorists of war crimes and debaters over the power of military tribunals are still addressing: How should retaliatory actions during war be defined, and who should determine the punishment of the perpetrators? Theodosius I ruled Rome, but according to the Catholic Church, he had to answer to the Supreme Being. In fact, the Church excommunicated Theodosius I and readmitted him to the Eucharist only after he had spent several months in public penance.

Medieval World

During medieval times, either kings or military commanders in charge of campaigns issued ordinances of war, which laid down the ground rules governing conflicts. Many of these ordinances dealt with matters that might in later centuries be considered to be war crimes. For example, in 1385, Richard II of England set out in his Durham Ordinances rules that prohibited robbery, pillage, and the killing or capture of unarmed persons belonging to the Church and of unarmed women. In 1419, Henry V put out his Mantes Ordinances, which barred soldiers from entering a place where a woman was lying and prohibiting them from robbing women. Lower-class tenant farmers were protected, and the capture of children below the age of fourteen, unless they were the children of persons of rank (because they would bring a high ransom), was also prohibited. Not all monarchs or lords were so inclined to limit the activities of their soldiers, and such ordinances were issued only on a case-by-case basis.

Modern World

In the twentieth century, "war crimes" have come to be defined by international conventions, the Geneva Conventions and the Hague Conventions, which had evolved over the course of the late nineteenth and early twentieth centuries. Following World War II, the atrocities perpetrated by aggressor states reached not only international proportions but also levels of inhumanity that offended most modern human sensibilities. Hence, in the 1950's and later, the Geneva Conventions were refined to define war crimes and their prosecution, and the International Criminal Court at The Hague was set up to hear tribunals involving those who have perpetrated "ethnic cleansing" and other atrocities.

Even democratic governments can be guilty of genocide and war crimes. The Trail of Tears—the forced relocation of Native Americans from their homelands in the southern United States to Indian Territory (present-day Oklahoma) in the western United States—is a significant example. In 1831, the Cherokee, Chickasaw, Choctaw, Creek, and Seminole tribes, together known as the Five Civilized Tribes, were living as autonomous nations in the American South. By 1839, with the Cherokee removal, all of them had been forced to walk hundreds of miles west to live on reservations in Indian Territory.

President Andrew Jackson pressured the Cherokees to sign a removal treaty. Jackson's successor, Martin Van Buren, imposed the terms of the treaty by allowing Georgia, Tennessee, North Carolina, and Alabama to raise an armed force of seven thousand troops, composed of militia, regular army, and volunteers. General Winfield Scott (later famous for his role in the Civil War) led the army, which rounded up thirteen thousand Cherokees and forced them to march more than one thousand miles—mostly on foot and without shoes, moccasins, or adequate clothing—to face the harsh winter weather of the Indian Territory. Approximately fifty-five hundred Cherokees died during this trek, now called the Long March (1834-1835).

During these tumultuous times, the Cherokee John Ross (1790-1866) proved to be the dominant spokesperson for his people. Of about seven-eighths Scottish ancestry, Ross had grown up in Cherokee and frontier American environments and had earned great wealth and an elite place in the Cherokee Nation. He represented the Cherokee Nation to the U.S. government, especially in the Cherokees' cases before the Supreme Court. Ross's life and career shone a glaring spotlight on many nineteenth century European American assumptions about Native Americans and race, revealing the willingness of white American citizens, as well as the U.S. government, to engage in war crimes and de facto genocide before modern definitions of war crimes identified their acts as such.

Another war, the American Civil War (1861-1865), highlighted the uneven relationships between war crimes, military tribunals, and practical applications of justice. Samuel Alexander Mudd (1833-1883), a physician, practiced medicine in Maryland and in 1865 was implicated and imprisoned for aiding and conspiring with actor John Wilkes Booth and others in the assassination of President Abraham Lincoln. Lincoln had used the exigencies of war to justify suspending the writ of habeas corpus and allowing controversial, and some claimed illegal, military tribunals to try both civilians and soldiers. In an ironic twist of history on May 1, 1865 (about two weeks after Lincoln was assassinated), President Andrew Johnson authorized one of the controversial tribunals to try the assassins. Historians agree that Dr. Mudd knew Booth well, and some believe that Mudd knew about and actively participated in the conspiracy. The authorities arrested Mudd, and the military tribunal, mostly based on circumstantial evidence, found him, along with seven others, guilty of conspiracy to murder Lincoln. Mudd was sentenced to life imprisonment at Fort Jefferson, 70 miles west of Key West, Florida, in the Gulf of Mexico. President Johnson pardoned Mudd on February 8, 1869, partially because of his heroic efforts to fight a yellow fever epidemic in the prison.

The story of Lieutenant William Calley, a U.S. Army officer who was found guilty of ordering the My Lai Massacre on March 16, 1968, during the Vietnam War (1961-1975), illustrates the potent and potentially disastrous mixture of political expediency and justice. Born in 1943 in Miami, Florida, William Laws Calley, Jr., enlisted in the U.S. Army in July, 1966. He arrived in Vietnam in 1967 as a second lieutenant of infantry and was the leader of First Platoon Company C, First Battalion, Twentieth Infantry of the Twenty-third Infantry Division of the United States. On March 16, 1968, Calley ordered his men to kill everyone in the village of My Lai, a small Vietnamese village. In the ensuing bloodbath, the soldiers killed at least five hundred villagers, mostly women and children. Calley was court-martialed in November 1970, and as his defense claimed that he was following the orders of his immediate superior, Captain Ernest Medina. In March, 1971, the jury convicted Calley of the premeditated murder of twenty-two Vietnamese civilians and sentenced him to life imprisonment at hard labor. Medina was acquitted.

Twenty-six officers and soldiers were initially charged for their part in the My Lai Massacre, but Calley was the only one convicted. Many Americans were outraged at his conviction and believed that the court-martial had not been just. On April 1, 1971—the day after Calley's sentencing—President Richard Nixon ordered Calley transferred from prison to house arrest at Fort Benning, pending appeal of his sentence. Secretary of Defense Melvin Laird protested this leniency, and the prosecutor, Aubrey Daniel, wrote, "The greatest tragedy of all will be if polit-

ical expedience dictates the compromise of such a fundamental moral principle as the inherent unlawfulness of the murder of innocent persons."

After more military interventions and another review by President Nixon, Calley served only three years of his sentence. Judge J. Robert Elliott of the federal district court granted him habeas corpus on September 25, 1974, along with immediate release, and further reviews and appeals upheld the habeas corpus writ. Some legal arguments contend that the outcome of the My Lai courts-martial reversed the Nuremberg and Tokyo war crimes tribunals, which set a historic precedent by establishing the principle that no one can use "following orders" as a defense for committing war crimes. *The New York Times* quoted Secretary of the Army Howard Callaway as stating that Calley's sentence was reduced because he (Calley) honestly believed that he was following orders. This reasoning directly contradicts the standards of the Nuremberg and Tokyo war crimes tribunals, which executed German and Japanese soldiers for murdering civilians.

The United States' invasion of Iraq in 2003 applied another wartime litmus test of the Geneva Con-

NARA

Defendants at the Nuremberg Trials circa 1946 are (left to right, front row) Hermann Göring, Rudolf Hess, Joachim von Ribbentrop, Wilhelm Keitel, and (left to right, second row) Karl Dönitz, Erich Räder, Baldur von Schirach, and Fritz Sauckel.

ventions. In 2004, stories of physical, psychological, and sexual abuse of prisoners began to surface from the Abu Ghraib prison in Iraq, including a *60 Minutes II* news report and a *New Yorker* article by Seymour Hersh. The personnel of the 372nd Military Police Company of the United States Army and other government agencies were identified as the perpetrators.

Donald Henry Rumsfeld (born 1932), an American businessman, served as the thirteenth secretary of defense under President Gerald Ford and the twenty-first secretary of defense under President George W. Bush (2001-2006). When the stories about Abu Ghraib broke, he addressed the Senate Armed Services Committee on May 7, 2004:

> These events occurred on my watch. As secretary of defense, I am accountable for them. I take full responsibility. It is my obligation to evaluate what happened, to make sure those who have committed wrongdoing are brought to justice, and to make changes as needed to see that it doesn't happen again. . . . To those Iraqis who were mistreated by members of U.S. armed forces, I offer my deepest apology. It was un-American. And it was inconsistent with the values of our nation.

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Kathy Warnes

BEHIND THE BATTLEFIELD

Cryptography

Overview

Cryptography encompasses use of letters, numbers, symbols, and words to form coded messages. Military personnel utilize cryptography to transmit orders to officers and troops on land, sea, or in air as well as to mislead enemies who intercept messages. Historians have analyzed the role of cryptography in warfare, often soon after major conflicts occurred, with scholars revising interpretations as information regarding secret code-breaking work became declassified and participants divulged their contributions. World War II and espionage were the focus of much historical scholarship examining cryptography in the late twentieth century. Early twenty-first century histories discussed digital aspects of encrypting military information and assessed cyber vulnerabilities affecting military forces.

Significance

Since ancient times, military forces have benefited from various forms of cryptography, which allows sensitive information to be transmitted without informing the enemy and which can also deliberately misinform the enemy, in the effort to win battles and wars. Codes disguising military information have enabled victories over enemies who were unaware when and where troops would attack, their strength, and other crucial facts. Moreover, the ability to intercept and decipher enemies' encrypted messages has alerted commanders to invasions so they can plan defenses and revise strategies. Military cryptanalysts have deciphered enemy messages regarding destruction of supply lines necessary for transportation of both military and civilian resources so officers could order strikes to stop enemies before they could act. Military leaders unaware of their opponents' plans have often experienced defeat.

History of Cryptography

Warfare has been influenced by cryptography for centuries. Although applications have varied, military forces in different eras have appropriated universal aspects of cryptography to transmit secret information. Basic ciphers often involved substitution of letters in a word or the rearrangement of their order. The frequency of specific letters and patterns has alerted cryptanalysts to the enemy's encoding key, so they could convert the remaining letters. Some cryptographers assigned words unique codes, which they

Greg Goebel

A four-rotor Enigma machine.

recorded in code books accessible to people composing messages and translating them; code books were vulnerable to being misplaced or theft by enemies. Knowledge of keys became essential for effective cryptography.

Ciphers and techniques associated with cryptography advanced as people recognized more complex ways to conceal messages with elaborate combinations of codes and sophisticated technology, such as machines and computers, devised to generate or decipher coded messages. Military cryptographers have constantly sought more secure encryption methods to outwit code breakers. Cryptanalysts honed their skills to comprehend meanings in otherwise nonsensical text. Military code specialists developed strategies to prevent enemy cryptographers from realizing their codes had been broken unless such awareness could be manipulated to confuse enemy officers. Codes associated with warfare throughout history have rarely proved impossible for enemies to decipher.

ANCIENT WORLD

Humans in ancient civilizations first utilized cryptography to protect secrets in communications from economic and political rivals, particularly during combat. Early methods often relied on people's insights regarding how to confuse enemies. Julius Caesar (100-44 B.C.E.) explained in *Comentarii de bello Gallico* (52-51 B.C.E.; *The Gallic Wars*, in his *Commentaries*, 1609), that he had disguised a communication to his Roman military officers fighting in Europe to prevent enemies from comprehending the message if they secured access to it. Aware that Cicero, overwhelmed by opposing forces, was thinking of surrendering, Caesar prepared a message to reassure his officer that he was sending reinforcements. Concerned about the enemy learning that more Romans were en route, Caesar wrote his message with Latin vocabulary formed with Greek letters. Cicero, fluent in both languages, announced Caesar's news to his soldiers, who rebounded to resist enemy attacks. Caesar also used substitution ciphers, in which pairs of letters corresponding with each other could be used to encode words. The "Caesar shift" that ancient historian Suetonius describes involved correlating letters with those three positions away, such as writing the cipher letter D for the text letter A.

Polybius created a grid with the alphabet placed in five columns and numbers from one through five written along the top and also descending on the left side to designate the rows and columns in which letters were located. The two numbers associated with each letter formed the cipher. Polybius stated that signalers could consecutively hold specific amounts of torches representing letters to send messages coded with his system to troops on the battlefield.

Other Romans used transposition ciphers, which rearranged letters to create nonsensical words or entire sentences that confused enemy readers. Most ancient cryptographic systems were vulnerable to being unraveled by the enemy, who occasionally would decode messages when recognizing the correct order of letters in a jumbled word or analyzing messages for patterns of the most common vowels and consonants, which could help determine the cipher technique that had been applied to a message.

Ancient historians such as Plutarch and Herodotus recorded incidents involving secret messages and cryptographic devices associated with warfare. For example, the Spartans in the fifth century B.C.E. provided military leaders with a wooden device called the *scytale*, which they wrapped with a parchment or leather strip circling it along the length of the scytale. A message was then written on the parchment or leather, with letters spanning the different wrapped strips. The strip was removed from the scytale and delivered by a courier to the military official for whom it was intended, who would then wrap the strip around his own scytale, which had to be of the exact same diameter. Without a corresponding scytale, the writing on the strip was indecipherable. Military victories attributed to scytale communications included that of Spartan military general Pausanias over Persian forces after he received troops requested through this form of encryption.

Demaratus, the ruler of Sparta exiled in Persia, alerted Greeks that the Persian ruler Xerxes' forces were planning an invasion. Demaratus etched his message on pieces of wood, which were coated in wax to hide his words. Persian guards did not suspect anything strange about those boards en route to the

recipients. Demaratus's clever approach succeeded in preparing Greeks to repel Persian efforts to conquer their territory.

In *Aineiou poliorketika* (after 357 B.C.E.; *Aeneas on Siegecraft*, 1927), Aeneas the Tactician described placing holes in disks in patterns to conceal messages that could be deciphered by threading a cord in the holes.

MEDIEVAL WORLD

During the Middle Ages, mathematicians and scientists created methods of encryption that were more complex than their ancient predecessors. Many of these encoded messages were used in military communications to outwit increasingly adept code breakers. By the late fourteenth century, governments were using ciphers for diplomatic correspondence in an effort to thwart spies.

In Italy, architect and engineer Leon Battista Alberti (1404-1472) devised a disk consisting of two rings with the alphabet printed on both. A person encoding a message set the rings and coded a few words with the corresponding letters, then moved the rings to code more text. Recipients deciphered messages by using a similar cipher disk and awareness of how they needed to adjust their device as they translated. Alberti innovated polyalphabetic cipher methods and discussed cryptography in his text *De componendis cifris* (c. 1466; *A Treatise on Ciphers*, 1997).

The Italian city-states sought cipher experts to create keys for codes and read rivals' messages, appointing people to positions of cipher secretary and cryptanalyst. In Venice, the Council of Ten and its secret police force maintained power and selected cryptanalyst Giovanni Soro (died 1544) in 1506 as Venice's cipher secretary. He skillfully cracked codes, including one used in a request that Holy Roman Empire army commander Mark Anthony Colonna had sent to Emperor Maximilian I, telling him he needed more funds, thus revealing that force's weakness.

In *Polygraphia* (1518), Johannes Trithemius (1462-1516) described a method of altering cipher keys as each letter was enciphered to produce more secure messages. Blaise de Vigenère (1523-1596), in *Traicté des chiffres* (tract on ciphers), examined contemporary cryptography and described coding messages with his tableau technique, which used twenty-six rows and columns in which letters shifted to the next position in each succeeding column and row. About 1550, Italian mathematician Gerolamo Cardano (1501-1575) publicized a concept in which the key for enciphering words in a message changed for every word following the first. Also trained as a physician, Cardano created masks with slots for writing portions of a secret communication on paper. The message, concealed when other text was written around it, was revealed only if a mask with the proper slots was available to the recipient. The Knights Templar used ciphers to write letters representing credit because they did not carry currency when they traveled on military crusades to the Holy Land.

MODERN WORLD

In the seventeenth century, French cryptologist Antoine Rossignol (1600-1682) contributed his skills to create and crack codes for King Louis XIII. In 1626, Rossignol examined an intercepted encoded letter that Huguenot leaders in Réalmont had written during their siege of that city. Rossignol decoded the letter, which revealed that the Huguenots were considering surrendering. Rossignol gave French representatives the deciphered message to show the Huguenots their dire situation was known, thus securing Réalmont for the French army. Rossignol continued his cryptographic services for the king and military. His son, Bonaventure Rossignol, also pursued cryptography. The pair devised a cipher using syllables instead of letters to encode royal messages. They emphasized capturing enemies' coded messages for military purposes, resulting in the creation of the Cabinet Noir, a group of cryptanalysts devoted to decoding intercepted diplomatic communications. Other European nations established similar cryptography services, which provided useful military intelligence during warfare.

By the nineteenth century, technological advances were having a great impact on military cryptography. The telegraph resulted in officers ordering cryptographers to encrypt messages prior to their subsequent transcription into Morse code. Auguste Kerckhoffs (1835-1903) contributed articles about cryptography to the *Journal of Military Science*,

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HEADQUARTERS,
AMPHIBIOUS FORCE, PACIFIC FLEET,
CAMP ELLIOTT, SAN DIEGO, CALIFORNIA

March 6, 1942

From: The Commanding General.
To: The Commandant, U. S. Marine Corps.

Subject: Enlistment of Navaho Indians.

Enclosures: (A) Brochure by Mr. Philip Johnston, with maps.
(B) Messages used in demonstration.

1. Mr. Philip Johnston of Los Angeles recently offered his services to this force to demonstrate the use of Indians for the transmission of messages by telephone and voice-radio. His offer was accepted and the demonstration was held for the Commanding General and his staff.

2. The demonstration was interesting and successful. Messages were transmitted and received almost verbatim. In conducting the demonstration messages were written by a member of the staff and handed to the Indian; he would transmit the messages in his tribal dialect and the Indian on the other end would write them down in English. The text of messages as written and received are enclosed. The Indians do not have many military terms in their dialect so it was necessary to give them a few minutes, before the demonstration, to improvise words for dive-bombing, anti-tank gun, etc.

3. Mr. Johnston stated that the Navaho is the only tribe in the United States that has not been infested with German students during the past twenty years. These Germans, studying the various tribal dialects under the guise of art students, anthropologists, etc., have undoubtedly attained a good working knowledge of all tribal dialects except Navaho. For this reason the Navaho is the only tribe available offering complete security for the type of work under consideration. It is noted in Mr. Johnston's article (enclosed) that the Navaho is the largest tribe but the lowest in literacy. He stated, however, that 1,000 — if that many were needed — could be found with the necessary qualifications. It should also be noted that the Navaho tribal dialect is completely unintelligible to all other tribes and all other people, with the possible exception of as many as 28 Americans who have made a study of the dialect. This dialect is thus equivalent to a secret code to the enemy, and admirably suited for rapid, secure communication.

NARA

A letter of recommendation for a Navajo enlistee emphasizes his ability to speak the Navajo dialect, which is "completely unintelligible to all other tribes and all other people."

U.S. Army

Comanche code talkers for the Fourth Signal Company, U.S. Army Signal Center, Ft. Gordon.

which were compiled into the text *La Cryptographie militaire* (1883; military cryptography). Kerckhoffs sought more secure ways to telegraph messages during wars, emphasizing that military ciphers should use keys that could be easily memorized, could be adapted for changing situations, and could remain secret.

Modern warfare involved numerous cryptography experts and events. During World War I, French code breaker Georges-Jean Painvin (1886-1980) worked in the Bureau du Chiffre (cipher bureau) to decipher German codes during crucial military operations in spring, 1918. Painvin evaluated German messages transmitted during combat in northern France and detected patterns of letters and digits that helped him discover the cipher used. Herbert O. Yardley (1889-1958) developed the World War I Cipher Bureau to support the U.S. military. He interacted with European cryptanalysts, including Painvin, to enhance American cryptography methods. Yardley wrote *The American Black Chamber* (1931), which revealed how code breaking enhanced U.S. military intelligence during warfare.

The British Government Code and Cypher School (GCCS) established its headquarters at Bletchley Park. Most Axis countries (Germany, Italy, and Japan) encoded their military communications with the so-called Enigma machine, which could created millions of ciphers. In the late 1930's, Polish mathemati-

cian Marian Rejewski (1905-1980) and associates told British and French officials how their technology helped decipher Enigma messages during the interwar period. World War II Bletchley Park cryptanalysts, mostly linguists and mathematicians such as Alan Turing, focused on the more complex Enigma ciphers German military branches used for orders, particularly those directing U-boat missions, which were disrupting North Atlantic Allied shipping. Engineer Thomas H. Flowers (1905-1998) built a digital computer, Colossus, to process encrypted German messages. Using Colossus computers, Bletchley Park cryptanalysts decoded more than 2.5 million communications during the war, which helped the Allied military prepare maneuvers in Europe, including the June, 1944, Normandy invasion.

In the Pacific, Leo Rosen created a facsimile of Japan's cipher machine. William F. Friedman (1891-1969), the U.S. Army Signals Intelligence Service chief, and Frank Rowlett (1908-1998) cracked Purple, the Japanese cipher used for diplomatic communications. Access to decoded Japanese military orders enabled U.S. naval pilots to hit the plane transporting Admiral Yamamoto Isoroku, the Imperial Japanese Navy's Combined Fleet commander. Cryptanalysts' work contributed to the American victory in the Battle of Midway in 1942. Approximately 420 Navajos served as code talkers, using their complex language to encipher communications in battles the U.S. Marines fought on Pacific islands. Officers credited the Navajos for American troops successfully securing Iwo Jima, among other strategic victories, which helped the Allies defeat Japan. The Japanese were unable to break the Navajo code.

Military cryptography embraced emerging technological advances, such as those of the digital revolution. Code experts applied mathematical functions, such as algorithms, to encode and decipher information digitally. The U.S. Military Academy's mathematical science department began publishing the journal *Cryptologia* in 1977. Codes were used to protect nuclear materials, electronic data associated with military procedures and records, and the Milstar satellites deployed for military communications.

Cryptography was utilized in the Vietnam War (1961-1975) and played an important role in the 1964

Bletchley Park, north of London, where the Enigma codes were cracked.

Gulf of Tonkin incident, where it was used to obtain congressional approval for nearly unlimited U.S. action in Vietnam. A part of the verification process that supported the idea that North Vietnamese torpedo boats attacked two American destroyers was the use of deciphered North Vietnamese communication. A National Security Agency report, declassified in 2006, revealed that it was likely that the communications were incorrectly deciphered.

Modern communication monitoring really hit its stride with the Persian Gulf War (1990-1991), as "traffic analysis" allowed Americans listening to massive amounts of communication to decipher Iraqi war plans. However, American cryptographic experts may have eventually become victims of their own success, as nations wishing to avoid American eavesdropping operations have returned to lower-tech ways of personally delivering messages.

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Elizabeth D. Schafer

Diplomacy

Overview

Diplomacy can be defined as the conduct of relations between sovereign entities such as nation-states, empires, and kingdoms. Diplomacy takes the form of negotiations between duly appointed agents, known as diplomats. Diplomacy is relevant to an understanding of all aspects of war, since diplomats are closely involved with war origins, the conduct of war, and the conclusion of hostilities. Historical studies of diplomacy have traditionally focused on the study of state papers and documents. In recent years, historians have widened the scope of the study of diplomacy to include all aspects of exchanges between states, including cultural and social contacts.

Significance

Diplomats are heavily involved in negotiations that precede the outbreak of wars. No student of World War I, for example, could come to a proper understanding of that war without developing a familiarity with the war's origins. During wartime, diplomats are actively engaged in attempting to win the active, or passive, support of neutral states. In coalition wars, or wars between alliance systems, diplomats are responsible for maintaining the strength of the coalition through the ups and downs of war. Diplomats discuss peace proposals with the enemy and take the leading role in talks that conclude the war. Postwar peace conferences, such as the Paris Peace Conference of 1919, are likewise the responsibility of diplomats.

History of Diplomacy

Ancient World

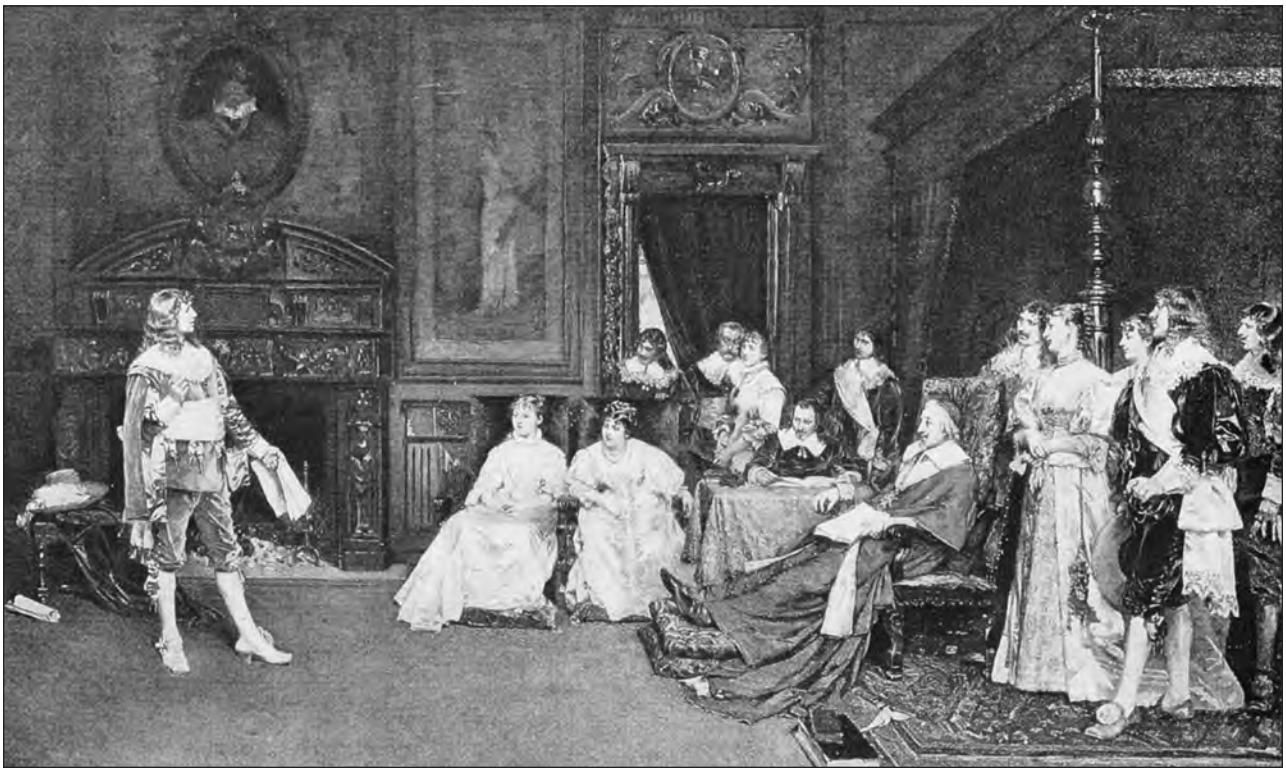
Diplomacy in the ancient world consisted of emissaries who were sent by the ruler of one state to the ruler of another state on a specific mission. Emissaries might be used to negotiate trade agreements, arrange dynastic marriages, or conduct discussions aimed at resolving a conflict. In order to lend credibility to the mission, emissaries were always members of the ruling elite or members of the ruler's family. Empires, such as those of the Assyrians (which reached its peak around 650 B.C.E.) and Persians (which dominated the Middle East by 513 B.C.E.), needed to manage relations with tributary states or with rival states on their borders. Diplomacy was particularly intense when a network of states of roughly equal power emerged, such as the Greek city-states of the Peloponnesian War (431-404 B.C.E.). Diplomats were usually ranked according to the importance of their mission and their social standing. When the mission was completed, emissaries would return home.

Medieval World

Diplomacy in the medieval world followed patterns established in the ancient world. One of the most frequently cited examples of medieval diplomacy is the relationship between Charlemagne (742-814), king of the Frankish Empire, which governed most of western and central Europe, and Hārūn al-Rashīd (763/766-809), ruler of the ʿAbbāsid caliphate, which included modern Iran, most of the Middle East, and North Africa. In China, the diplomacy of the Ming Dynasty, which emerged in 1368, involved the management of relations with subordinate, tributary states that existed on the periphery of the empire. The same could be said for the diplomacy of the Ottoman, Mughal, and Persian empires. The Papacy was particularly active diplomatically, at one point maintaining a permanent mission at the Byzantine court. Permanent diplomatic missions would become a hallmark of the modern conception of diplomacy.

Modern World

Most scholars would trace the origins of the modern system of diplomacy to Renaissance Italy. By the time of the Renaissance, the Italian peninsula was di-



F. R. Niglutsch

The court of the influential French minister Cardinal de Richelieu, who was a dominant diplomatic figure during the reign of Louis XIII.

vided into a number of city-states, which engaged in frequent bouts of warfare. Venice emerged as a major commercial power in the Mediterranean by the fourteenth century. All the Italian city-states needed accurate information from their rivals in order to keep ahead of the intrigues that dominated the Italian peninsula at the time.

Venice, in particular, required information on foreign markets and the activities of its competitors. Such needs led to the stationing of agents, or ambassadors, in foreign capitals on a permanent, not temporary basis. The concept was soon adopted across Europe. Written reports by ambassadors and their subordinates had to be analyzed and filed on receipt in the home country. Governments established foreign ministries, staffed by bureaucrats, to process incoming reports and send out instructions. The heads of these ministries, known as foreign ministers or foreign secretaries, emerged as some of the most powerful members of the cabinets of European states. Diplomacy continued to be dominated by the aristocracy. Commentators wrote books giving advice to rulers on the practice of diplomacy and statecraft. Perhaps the most famous of these works is *Il principe* (1513, pb. 1532; *The Prince*, 1640), by Niccolò Machiavelli (1469-1527).

Prominent practitioners of diplomacy included France's Cardinal de Richelieu (1585-1642). Richelieu served as chief minister to King Louis XIII from 1624 to 1642. Richelieu put forward the concept of *raison d'état*, by which he meant that the good of the state is supreme. Diplomacy, according to Richelieu, must be conducted free of sentiment or ideology. Alliances, he held, should be made and broken according to the interests of the state. Critics denounced Richelieu for his alleged lack of morality, but Richelieu merely replied that the good of the state was the ultimate in morality.

White House photo by Byron Schumaker

U.S. president Richard M. Nixon is widely credited with having helped open China to the West during the height of the Cold War.

The Peace of Westphalia of 1648, which ended the Thirty Years' War (1618-1648), is often cited as the first diplomatic conference. The treaty explicitly recognized and formalized the principle of state sovereignty. States now had the right to govern their affairs, free of interference from outside powers. By the eighteenth century, observers of international affairs, such as the Scottish philosopher David Hume (1711-1776), began articulating a concept known as "balance of power." The new doctrine held that international relations should be dominated by a number of states of equal power that could restrain the ambitions of any one power that tried to dominate the others.

Restoring the balance of power in Europe was the main aim of the Congress of Vienna (1815), the most important diplomatic conference of the nineteenth century. The Congress of Vienna, held at the end of the wars of the French Revolution (1789-1793) and the Napoleonic Wars (1793-1815), tried to restore peace to Europe after many years of turmoil. Dominated by the Austrian foreign minister Prince Klemens von Metternich (1773-1859), the Congress redrew the borders of Europe. Metternich hoped that the five great powers of Europe (France, Britain, Austria, Prussia, and Russia), acting in concert, could maintain stability in Europe. Metternich's "Concert of Europe," however, sought to maintain the rule of authoritarian, antidemocratic empires increasingly at odds with awakening nationalist and liberal sentiments in Europe.

By the 1860's, the concept of Realpolitik came to dominate diplomacy. Major practitioners of Realpolitik included Count Camillo Cavour (1810-1861),

prime minister of the Italian state of Piedmont; Louis Napoleon (Napoleon III, 1808-1873), emperor of France; and Otto von Bismarck (1815-1898), chancellor of Prussia and then Germany. Realpolitik returned to the style of diplomacy advocated by Richelieu. Once again, national interest assumed supreme importance in the conduct of diplomacy. Treaties and moral obligations could be thrown overboard if the situation demanded. Cavour succeeded in uniting the scattered Italian states using the methods of Realpolitik. Louis Napoleon was less successful in his diplomatic career, and France was defeated in the Franco-Prussian War of 1870-1871. Louis Napoleon's enemy, Bismarck, chancellor of the German state of Prussia and an unapologetic practitioner of Realpolitik, masterminded the unification of the German states and the defeat of France. The new German state became the center of diplomacy in Europe.

Bismarck put Germany at the center of a web of alliances designed to maintain Germany's predominant position in Europe. In 1884 he presided over the Berlin Conference, which established the ground rules for European expansion into Africa and Asia at the end of the nineteenth century. Diplomacy in Europe now had dramatic, worldwide consequences.

The era of classical diplomacy, when diplomats came from similar aristocratic backgrounds and shared common assumptions about the conduct of diplomacy, came to an end with the outbreak of World War I in 1914. The war left nine million dead and large areas of Europe devastated. Public opinion increasingly condemned "old diplomacy," with its secret alliances and treaties, and held diplomats responsible for the outbreak of war. President Woodrow Wilson (1856-1924) of the United States advocated a new style of "open diplomacy." The Paris Peace Conference of 1919, called to redraw the map of Europe following the war, established the League of Nations, one of Wilson's most important ideas. The League would substitute the rule of law for anarchy and brute force in international relations. Member nations were required to submit disputes to the League for peaceful resolution. Aggressors faced sanctions and possible military action. Hopes soared that a new era in international affairs had arrived. In 1928 practically all the independent states of the world signed the Kellogg-Briand Pact. Signatories to the pact promised to renounce the use of war as a means for settling disputes. Arms control conferences, such as the Washington Naval Conference of 1921-1922, promised to end expensive arms races.

Unfortunately, the League of Nations was hobbled from the start by the absence of the United States, which withdrew into isolation after 1919. The League proved unable to withstand the challenges of aggressive and expansionist states, such as Japan, Italy, and Germany in the 1930's. In 1931, Japan conquered the Chinese region of Manchuria with impunity. Fascist Italy, led by Benito Mussolini (1883-1945), invaded Ethiopia in 1935, a final discrediting of the League.

The worsening international situation in the late

NARA

The Camp David Accords (1978), signed by Egyptian president Anwar el-Sadat (right) and Israeli prime minister Menachem Begin (left), were witnessed by U.S. president Jimmy Carter and paved the way for the 1979 Israel-Egypt Peace Treaty.

1930's, with Nazi Germany under Adolf Hitler (1889-1945) challenging Britain and France, saw the rise of summit diplomacy. Air travel, along with modern communication, meant that leaders could conduct their own face-to-face meetings with foreign leaders to resolve crises. Accordingly, British prime minister Neville Chamberlain (1869-1940) flew to Germany three times in 1938 to negotiate a solution to the crisis over Czechoslovakia. War broke out a year later, but summit diplomacy remained as a key characteristic of modern diplomacy. During World War II (1939-1945), Allied leaders met repeatedly to plan the course of the war.

The numerous crises of the ensuing Cold War ensured that the practice continued. The meetings of Soviet and American leaders always received massive publicity and press coverage. The Cuban Missile Crisis of 1962, which brought the world to the brink of a nuclear war, reinforced the need for instant communication between leaders. President John F. Kennedy (1917-1963) and Soviet premier Nikita Khrushchev (1894-1971) set up a telephone "hot line" to ensure clear communication in a crisis.

Face-to-face meetings between world leaders remain the preferred means of diplomacy in the twenty-first century. International institutions such as the United Nations, the European Union, and the North Atlantic Treaty Organization (NATO) also serve as important venues for diplomacy. Ambassadors and foreign ministries continue to play important roles, if slightly diminished compared to the age of classical diplomacy. The vast increase in the number of independent states since 1945 has ensured that the practitioners of diplomacy today are far more diverse and varied in their backgrounds and worldviews than in the past.

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Paul W. Doerr

Financing War

Overview

Finance can be defined as the way goods or services are funded. Historically, financing of war, which is an expensive activity, has been achieved in a number of ways in order to pay for the logistics and the personnel of military forces. Three major ways of financing war are taxation, borrowing, and money management. Today the study of war finance is usually included under the heading "defense economics."

Significance

Since war is as old as humanity, the financing of war has varied through the ages. It is also an expensive activity: As Sunzi (Sun Tzu) noted in his book, *Sunzi Bingfa* (c. fifth-third century B.C.E.; *The Art of War*, 1910), written during China's Warring States period, an army is kept for a thousand days to be used on one day—that is, the army (or navy) must be paid for more than a thousand days, but then all is spent in one day, when it is probably destroyed.

The method for financing war can contribute to the ultimate success of the combatants. The French Army under Napoleon I traveled on its stomach by foraging, which was simply taking from the local agrarian populations whatever food it could find. During the Iberian campaign, the British practice of paying in gold sovereigns for its supplies bought goodwill among civilian populations.

Many revolutions, civil conflicts, and wars have been won because the victors had superior resources for sustaining war over a long period of time, enabling them to exhaust the vanquished. Ultimately this is how the West defeated the Soviet Union in the fifty-year Cold War (1945-1991) between the communist bloc and the West. In the end, President Ronald Reagan moved the United States into an arms race that bankrupted the Soviet Union but caused no special financial damage to the West.

History of Financing War

Ancient World

Probably the most basic way in which war has been financed has been through plundering. Tribal chiefs, bandit chiefs, or other leaders—who if successful enough came to be called kings—would gather an armed body of men who would raid their neighbors, their enemies, or even distant victims. The goal was to take what could be found and then return.

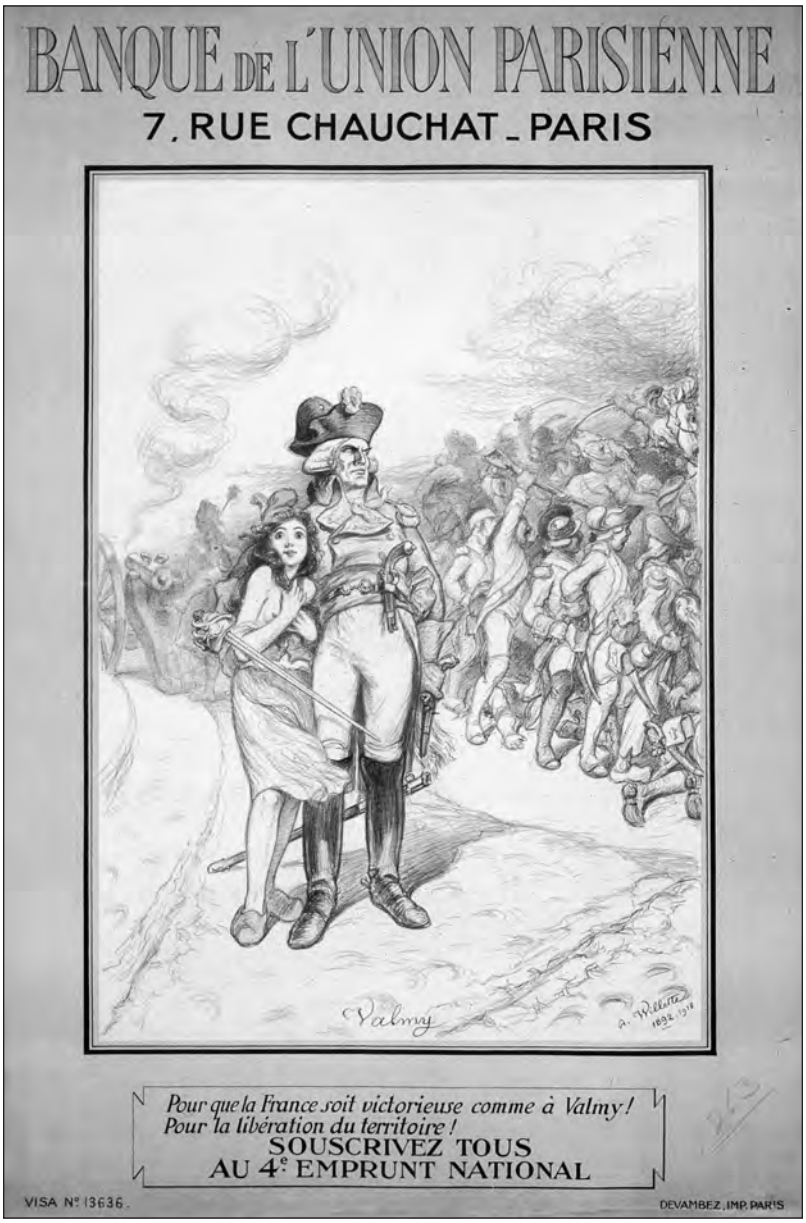
Raids are temporary. The Bedouins of the Arabian, Syrian, and North African deserts, as well as other nomadic groups, would usually steal livestock, women, children, and portable goods in order to trade them at home. However, when raids turned into permanent invasions, then the method of finance changed into demands for tribute. The conquered would be forced to finance their own subjugation, with tribute payments in kind, in precious metals or gems, or even in people.

Armies in ancient times supported themselves by capturing the supplies of other armies. The Greeks, after the Battle of Marathon (490 B.C.E.), were astounded at the riches they had captured from the Persians. Many armies, especially guerrilla groups, have financed themselves with captured weapons and matériel.

Capturing slaves was another method for financing war, used in both ancient and medieval times. Captured sites would yield not only valuable objects as booty but also soldiers and civilians who could be sold into slavery. The slaves would be exploited as servants, laborers, sacrificial victims, and even sexual objects.

Medieval World

The feudal system required that kings and their vassals provide protection for the people of their estates. Despite that obligation, kings and vassals turned to those people for military service rather than hiring trained soldiers—hence, service to the lord of the



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The Battle of Valmy was touted as the first step in the French Revolution and was used in this poster to encourage French citizens to buy war bonds "so that France will be victorious as at Valmy."

manor in the form of military service was a method for financing war in economies that were essentially agrarian. At times wars were also financed by kings from out of their own personal incomes. The development of the English parliament arose from the need of the kings to secure authority for taxes levied on the "commons" (common people) in order to finance wars. War financing through gifts has been far less common than financing through some form of coerced "taking," ranging from plundering to taxation.

MODERN WORLD

Whenever governments have grown large enough to impose taxes, these taxes have on occasion been used to finance wars. High taxes that have been paid unwillingly in wars that have continued for a long period of time have often caused enough political instability to destroy governments.

Wars have also been financed by loans. The American Revolution was financed in part by loans obtained from bankers in Europe. The use of loans to finance the revolution also occurred at the local level. Many Revolutionary War soldiers, for example, borrowed against their farms. This activity was to contribute to an uprising of Revolutionary War veterans in Shays's Rebellion in 1786. Some classical economists, such as Adam Smith, author of *The Wealth of Nations* (1776), opposed financing wars through loans because they believed it masked the costs of wars. Their opposition was not motivated by pacifism but by a practical belief that paying directly for wars would reduce both their occurrence and their duration. Also during the American Revolution, the British used an old method for recruiting armies, the hiring of mercenary troops (in this case, from Germany).

Money management during the revolution also involved inflationary printing of money. American colonists were accustomed to manufacturing their

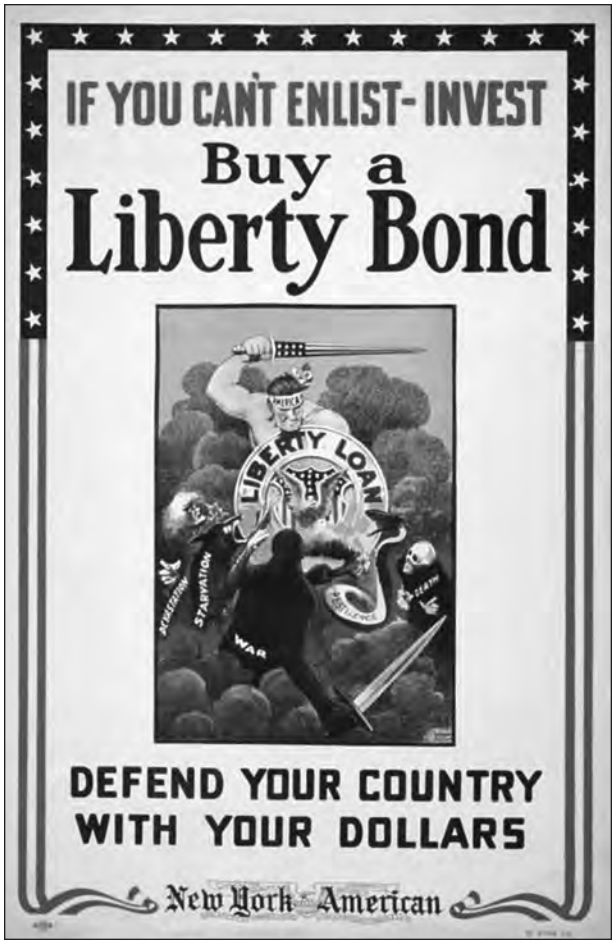
own money as a way to have enough specie and other forms of cash available for business in economies that suffered from the mercantilist policies of the British Empire. Continental currency was printed and used among the revolting colonists. Eventually the Continentals generated inflation sufficient to earn the expression "not worth a Continental damn." Inflation, nevertheless, would continue to be used to finance wars.

On the high seas, another form of indirect funding was used until the Paris Declaration Respecting Maritime Law was signed on April 16, 1856. The declaration outlawed letters of marque and reprisal. Letters of marque had frequently been issued by governments to privateers, allowing them to wage war at sea against the merchant and naval vessels of the enemy country or countries. The letters of marque gave the privateers legal authorization for activities that otherwise would have been treated as piracy. The ships that were seized and their cargos could be sold in home ports or neutral ports as prizes of war. The privateers' ship owner, captain, and crew would share in the profits as well as in the dangers of naval warfare. Hence, letters of marque generated inexpensive ways for governments to finance naval warfare.

During the American Civil War (1861-1865), both the North and the South issued currency to finance the war. In the North the currency was popularly known as "greenbacks." In the South it came to be called Confederate money. Both also instituted taxes, although the South taxed lightly compared to the North. Both also seized the "contraband" of the other's supporters as well as the public material or money of their respective governments. Bank robberies in raids were used to acquire funds. A raid on St. Albans, Vermont, by Confederate cavalrymen targeted three banks and netted more than $200,000.

With the entry of the United States into World War I, the U.S. government again resorted to borrowing in order to finance the war effort. Financing wars grew enormously at this time, when the French and British used the financial services of J. P. Morgan (through the House of Morgan) to provide loans for the purchase of war supplies. In the process, the Morgan bank became a virtual sutler to the Allied effort, letting contract for herds of livestock, food, ammunition, and other war supplies. The Morgan bank also was seen by isolationists, pacifists, and others as an arms merchant that profited from the blood of others.

Borrowing to finance war is limited only by the amount of credit that a government can get, and defaulting on war debts is a funding tactic that has been used historically many times. The Fifth Amendment to the Constitution of the United States repudiated Confederate War debts, a default upheld by the Supreme Court in *Principality of Monaco v. Mississippi* (1934) to the loss of British bond holders and others.



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A poster by Winsor McCay exhorts Americans to support World War I; the American soldier is defended against the threats of "devastation," "starvation," "war," "pestilence," and "death" by the shield of liberty loans.

Bank loans were not enough, however, so campaigns to fund the war with "liberty bonds" (debt securities) and (in Canada) "victory bonds" were marketed to citizens. Even before the United States entered World War II, it began selling war bonds identified as Series E, F, and G bonds. Canada financed half of its war costs though war bonds. Bonds had three advantages: they financed the war, reduced inflationary pressures, and enlisted patriotic fervor. Germany also used drives to sell the public war bonds, called *Kriegsanleihe*. The Nazis financed much of their war effort with bonds, and the Austro-Hungarian Empire conducted nine drives.

The method used by the United States to raise the more than $300 billion it spent fighting the Axis powers in World War II combined borrowing and taxation with Federal Reserve management of the money supply to increase war finance while keeping inflation low. The taxation transferred spending from individuals to the government. However, its spending put money into the bank accounts of millions of military personnel, war production personnel, and others, thereby raising the bank reserves of the nation's banks. By managing the reserve requirements, the Federal Reserve was able to provide banks with liquidity for war loans to industry, to the government, and to individuals. In all, about a third of the funding came from borrowing, a third from taxation, and a third from expansion of the money supply, which allowed for more borrowing and taxation. Such methods would be used later to finance the Cold War as well as the wars in Korea (1950-1953) and Vietnam (1961-1975).

Clandestine warfare has at times been funded from both legal and illegal sources. The Central Intelligence Agency (CIA) laundered money through the Pakistani Inter-Service Intelligence (ISI) to fund a ghost war against the Soviets in Afghanistan (1979-1989). Purely illegal funds have been generated by "blood diamonds," drugs, smuggling, and other black-market commodities. The ill-gotten gains have been used to fund terrorist groups.

In modern times, defeated nations occasionally have been compelled to pay reparations, such as those imposed on Germany after World War I, thereby paying the victors' war costs. This is another form of tribute—which can prove counterproductive in the long run, as demonstrated by German resentment after World War I, when the 1919 Treaty of Paris, which proved punitive to Germany, actually helped sow the seeds of World War II. A representative to the Paris Peace Conference of 1919, economist John Maynard Keynes, resigned in protest over the imposition of reparations upon Germany. It was a failure, he believed, to finance the peace with reparations. Financing of war recovery is a war cost, one that is necessary to establish a prosperous peace.

During the Cold War, the use of mercenaries was transformed into proxy wars between communists (mainly the Soviet Union) and the West (primarily the United States and Western Europe). In a number of places, the manpower for the war was local, but the combantants' equipment and wages were supplied by the Soviet Union or the United States in the form of military aid funded by tax monies from the two superpowers. The U.S. policy of "containment" mandated support for local wars against communist-backed aggressors, theoretically to stave off the worldwide spread of communism. Such an approach was cheaper than a larger power struggle between the main Cold War opponents and, given the advent of nuclear weapons, perceived to be safer as well.

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Andrew J. Waskey

Intelligence and Counterintelligence

Overview

Simply put, intelligence (or "intel") is information that has been processed, evaluated, and analyzed. Intelligence exists to support policy makers and military leaders in a variety of ways. Basically, intelligence is concerned with issues related to national security and is normally collected and processed in secret. Counterintelligence (CI) is the effort made by intelligence organizations to prevent foreign intelligence services from gaining information about them or disrupting their activities. CI efforts are also directed at preventing other intelligence services from conducting espionage within a nation's borders. The military also conducts CI in order to carry out protective measures at home and among units deployed abroad.

Significance

The role of intelligence and the agencies that conduct intelligence activities can be broken down into four primary components. The first is to prevent a potential enemy from achieving strategic surprise. Second is to provide policy makers with knowledge that has been collected and assessed by experts, usually over a long period of time. This is especially important in governments where the leadership is transitory. The third role is to support the policy-making process. Decision makers require current intelligence in order to determine what policies they may wish to carry out. Timely intelligence can offer critical background information, help determine risk, and enable leaders to consider the potential risks and rewards of the decisions they are considering. Finally, there is the need to keep secret the methods of collecting intelligence as well as the information needs of decision makers. Governments and the military need to keep some information secret from others and, at the same time, have ways of getting information from those who wish to keep their knowledge confidential. This makes having intelligence services vital, for both civilian and military organizations.

History of Intelligence and Counterintelligence

Ancient World

The importance of good intelligence has been understood throughout history. The ancients of the Middle East, the Egyptians in particular, had sophisticated intelligence organizations. The Egyptians were among the earliest to employ codes, specialized inks, and other methods for communicating secretly in writing, for example. Other ancients in the Middle East also carried out intelligence activities. According to the Bible, the Hebrews relied on the use of spies as they entered the Promised Land.

The Greeks and Romans relied heavily on intelligence to govern and defend their respective civilizations. The story of the Trojan horse is a classic example of the use of deception to defeat an enemy. The Greek city-states routinely spied on one another, seeking intelligence about military strength and defensive capabilities. The Romans were very dependent on intelligence, especially after the creation of the empire. Rome routinely conducted espionage activities against its neighbors in order to gauge their respective strengths and weaknesses. Agents also were used to try to induce potential enemies to ally themselves with Rome. Counterintelligence activities had more of a political connotation as rival factions within the government often plotted against one another.

The legendary ancient Chinese general Sunzi

(Sun Tzu) commented on the importance of learning about one's enemies and the use of spies to gather intelligence. Writing in *Sunzi Bingfa* (c. fifth-third century B.C.E.; *The Art of War*, 1910), Sunzi outlined methods for establishing espionage networks and for the recruitment of defectors. Kauṭilya (also known as Cāṇakya or Chanakya, fl. 300 B.C.E.), in ancient India, also noted the value of intelligence gathering. During the feudal period in Japan, ninjas often served as spies for samurai warlords. In general, however, intelligence processes were at the mercy of the skills and the interests of individual rulers.

MEDIEVAL WORLD

The fall of the Roman Empire and the onset of the Middle Ages meant that intelligence was focused primarily on military operations or on keeping an eye on one's vassals. To what degree feudal lords engaged in intelligence activities is difficult to say, as there are no surviving records of such endeavors. The only real full-time intelligence community to come into being in the Middle Ages was created by the Roman Catholic Church. The onset of the Crusades led the Church to engage in a variety of intelligence operations including spying, sabotage, and even rescue missions to free prisoners of war. At the same time, the increase of religious fervor sparked by the Crusades led to the Inquisition, which could be thought of as a counterintelligence effort directed against heretics and dissenters. Domestic spying was a vital part of the Inquisition; secret police forces were used by the Church and the Spanish monarchy to root out heresy and political dissent.

As nation-states began to emerge, intelligence began to take on a greater level of organization. Niccolò Machiavelli wrote of the importance of intelligence to rulers who wished to protect their power. Ivan the Terrible (Ivan IV) created Russia's first secret police system in the sixteenth century. In England, Queen Elizabeth I relied on the skills of Sir Francis Walsingham to provide her with intelligence. Referred to as the Queen's "spymaster," Walsingham was one of the first to utilize intelligence methods in a modern sense. He developed an organization that collected intelligence throughout Europe, penetrated the Spanish military, and used counterintelligence methods to defend Elizabeth from domestic plots. The intelligence community created by Walsingham is noteworthy for its reliance on academics, linguists, scientists, engineers, and other experts for both the gathering and the analysis of intelligence. During the Thirty Years' War (1618-1648), the Cardinal de Richelieu in France played an important role in the establishment of French intelligence. He used domestic spies judiciously in order to defend the monarchy from potential enemies, and his spies abroad not only provided intelligence culled from other European monarchs but also worked to deceive them with false information.

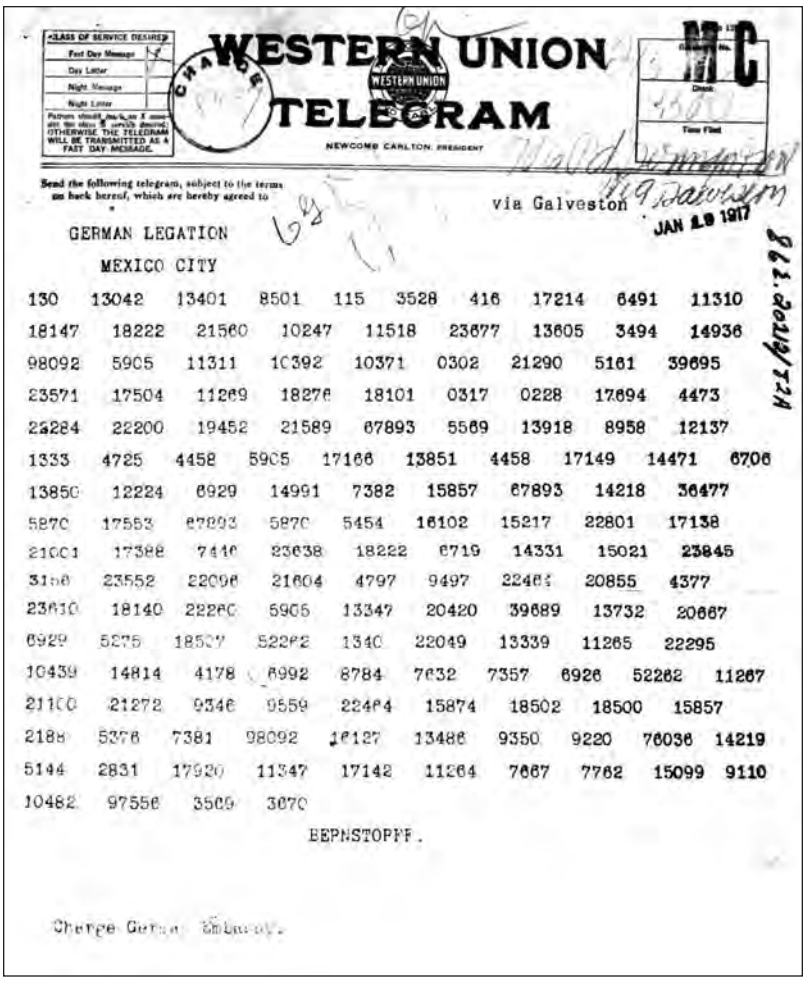
MODERN WORLD

Intelligence began to take on forms that are more recognizable in today's world. A series of revolutions and wars from the seventeenth through the nineteenth century led to an increasing appreciation of intelligence and counterintelligence and the use of clandestine and covert operations. George Washington was especially aware of the importance of good intelligence, and he worked diligently to learn about the intentions of the British during the American Revolution (1775-1783). Washington proved to be a most capable spymaster: He successfully organized and supervised spy rings, recruited agents, organized deceit and deception operations, helped develop the codes and disappearing inks his spies used, and even served as his own intelligence analyst. Washington fully understood the importance of secrecy in intelligence operations in order for them to be successful. Later, as president, he oversaw the intelligence activities of the United States—the first American president to do so—and thereby established the precedent of executive control of the intelligence function.

A diplomat named William Wickham (1761-1840) oversaw British intelligence efforts against France during the French Revolution (1789-1793) and Napoleonic Wars (1793-1815). Operating from his diplomatic post in Switzerland, Wickham organized spy rings and supported operations designed to restore the French monarchy. Although these attempts failed, Wickham continued to operate spy rings that provided the British with key information about French military activities until the French

learned of his spying and got the Swiss to have him removed from his post. British agents also carried out several unsuccessful attempts to assassinate Napoleon Bonaparte during his reign as emperor. Intelligence was equally important to the French. Counterintelligence was carried out by Joseph Fouché, who had enemy agents discredited or killed. Napoleon also oversaw intelligence operations, supervising spies and organizing operations designed to deceive enemy commanders. Likewise, under the direction of Prince Klemens von Metternich, Austria developed an effective intelligence organization to keep tabs on domestic and foreign threats. By the 1850's, Prussia was relying on its secret police to guard that nation's national security, and later it used espionage to help prepare for German unification. The use of an extensive network of spies was a major factor in the German defeat of France in the Franco-Prussian War (1870-1871).

Intelligence played a vital role in the American Civil War (1861-1865). Both the North and the South utilized spies, but new technologies also began to revolutionize intelligence activities. Both sides made use of balloons in order to conduct aerial reconnaissance. The telegraph not only allowed for speedier communications but also led to more sophisticated encryption and code-breaking efforts. False messages were often transmitted from captured telegraph stations. Both sides even tapped each other's telegraph lines. Information was acquired not only from spies but also from prisoners of war, documents taken from the battlefield dead, and newspapers.



WESTERN UNION TELEGRAM

NEWCOMB CARLTON, PRESIDENT

Send the following telegram, subject to the terms on back hereof, which are hereby agreed to

via Galveston

JAN 19 1917

GERMAN LEGATION

MEXICO CITY

130 13042 13401 8501 115 3528 416 17214 6491 11310
18147 18222 21560 10247 11518 23677 13605 3494 14936
98092 5905 11311 10392 10371 0302 21290 5161 39695
23571 17504 11269 18276 18101 0317 0228 17694 4473
25284 22200 19452 21589 67893 5569 13918 8958 12137
1333 4725 4458 5905 17166 13851 4458 17149 14471 6706
13850 12224 6929 14991 7382 15857 67893 14218 36477
5870 17553 67893 5870 5454 16102 15217 22801 17138
21001 17388 7440 23638 18222 6719 14331 15021 23845
31b0 23552 22096 21604 4797 9497 22464 20855 4377
23610 18140 22280 5905 13347 20420 39689 13732 20667
6929 5275 18507 52262 1340 22049 13339 11265 22295
10439 14814 4178 8992 8784 7632 7357 6926 52262 11267
21100 21272 9346 9559 22464 15874 18502 18500 15857
2188 5376 7381 98092 16127 13486 9350 9220 76036 14219
5144 2831 17920 11347 17142 11264 7667 7762 15099 9110
10482 97556 3569 3070

BEPNSTORFF.

Chargé Germ. Embassy.

AP/Wide World Photos

The decoding of the so-called Zimmermann note, an intercepted German telegram that proposed an alliance of Germany, Mexico, and Japan against the United States, led the Americans to declare war on Germany on April 6, 1917.

Prior to the outbreak of hostilities in 1914, Germany had undertaken massive spying efforts in France and Great Britain. German spies sought to obtain military secrets as well as confidential political and industrial information. In addition to its espionage activities during World War I, Germany also conducted sabotage operations not only against its opponents but also against neutral nations, such as the United States.

The British responded to reports and rumors of German espionage by creating the Secret Service Bureau to counter the German intelligence-gathering efforts. By the eve of World War I, the British Secret Service had largely broken up Germany's spy rings, and it continued to identify

and apprehend enemy agents during the war. Counterintelligence efforts also were directed at protecting vital ports, factories, and warehouses from enemy saboteurs. In the United States, the responsibilities of the Federal Bureau of Investigation (FBI) were expanded to include counterintelligence activities. Both sides relied heavily on encryption and code-breaking techniques for intelligence and counterintelligence purposes. The interception and decoding of the "Zimmermann note" by the British was a significant counterintelligence victory that contributed to the entrance of the United States into the war.

Technological advances, particularly in communications, made the need for accurate intelligence, delivered quickly, a necessity for all of the belligerents. Equally important was counterintelligence. The outcome of battles was often the result of good intelligence or counterintelligence. In the secret war of intelligence, the Allies won a decisive victory over the Axis powers. The Ultra project, for example, enabled the British to decipher German codes and contributed to the successful defense of Great Britain against the German air offensive of 1940, and to the defeat of Erwin Rommel and his German forces in Africa. The ability of the U.S. Navy to break Japan's naval codes led to an American victory at the Battle of Midway (1942). The Allies were able to perform successful deceit and deception operations against the Germans, and a variety of covert operations were carried out by the British Special Operations Executive (SOE) and the American Office of Strategic Services (OSS). Aerial reconnaissance came into increasing use as well. Although the Axis powers conducted numerous intelligence activities as well, their efforts were not as successful as those of the Allies.

There were failures, however. The successful Japanese attack at Pearl Harbor was the result of a massive intelligence failure on the part of the United States. Information was not shared between intelligence offices, and American analysts assumed that the disparity in strength between the two nations would keep the Japanese from risking war with the United States. In addition, the war-making capabilities of the Japanese were seriously underestimated. Finally, despite their alliance with both countries, Soviet spies penetrated the British and American atomic bomb projects.

Prior to World War II, the United States had no real intelligence organization to speak of. The Japanese bombing of Pearl Harbor on December 7, 1941, had demonstrated the need for a structured intelligence function within the government, and this led to the establishment of the Central Intelligence Agency (CIA) in 1947. The United States was the last of the world's major powers to create a national intelligence agency, and the CIA quickly took up its role in gathering foreign intelligence and conducting covert and clandestine activities abroad. Other major intelligence agencies included the Soviet Komitet Gosudarstvennoi Bezopasnosti (Committee of State Security, or KGB), Britain's MI6, China's Central Department of Social Affairs (now the Ministry of State Security), and Israel's Mossad.

Decades of distrust between the United States and the Soviet Union and the destruction of the balance-of-power system in World War II helped bring about conflict between the United States and the Soviet Union. The Cold War would result in a great deal of intelligence activity between the United States and the Soviet Union, along with their respective allies. The competition for intelligence between the two sides was intense. Massive espionage networks sought to gather intelligence and engaged in counterintelligence operations against each other. The Soviets tended to rely more on human intelligence (HUMINT), or spies, for acquiring intelligence, while the United States emphasized technology to a greater degree. The establishment of the National Security Agency in 1952 and its mission of collecting foreign signals intelligence (SIGINT) and cryptanalysis reflected the American focus on technology as a primary collection resource.

Aerial reconnaissance, such as U-2 and SR-71 overflights of the Soviet Union and other nations, provided the United States with critical information about their missile and nuclear capabilities, and both sides eventually used orbiting satellites to monitor compliance with nuclear and arms reductions treaties, movements of military units, and the general state of affairs within other nations, as well as for in-

tercepting communications. Spies such as Julius and Ethel Rosenberg, Aldrich Ames, and Robert Hanssen in the United States, and Kim Philby and Klaus Fuchs in Great Britain, turned over atomic and other secrets to the Soviet Union, while Soviet military officers such as Oleg Penkovsky and Pyotr Popov provided British and American intelligence with vital information about Soviet military and intelligence capabilities and operations.

The end of the Cold War brought new challenges for intelligence agencies, particularly the rise of international terrorism. The penetration of terrorist cells is difficult for a variety of reasons, not least of which is that members of terrorist organizations are known to one another or have contacts who can vouch for them. Therefore intelligence agencies often rely heavily on a variety of other techniques, including SIGINT, imagery intelligence (IMINT), and financial research and analysis, to monitor terrorist organizations and apprehend their members.

Besides terrorism, nations face other threats to their security, and they will continue to seek out intelligence about the intentions and capabilities of enemies, potential enemies, and even friendly nations. In addition, border security issues, internal dissent, competition for natural resources, the proliferation of weapons of mass destruction, the resurgence of piracy, and numerous other regional and global issues will make intelligence a vital function of governments for a long time to come.

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Knightley, Philip. *The Second Oldest Profession: Spies and Spying in the Twentieth Century*. New York: W. W. Norton, 1980. A history of spies and spying, from the first modern intelligence agency, established in 1909, to the present day, with emphasis on Britain, France, Germany, Russia, and the United States. Knightley is unsympathetic to elaborate espionage operations, considering them expensive and corrupting.

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Richelson, Jeffrey T. *A Century of Spies: Intelligence in the Twentieth Century*. New York: Oxford University Press, 1997. Written by a senior fellow at the National Security Archive, this

volume examines both technological and human intelligence and their impact on history, decade by decade: from Adolf Hitler through the Cold War to economic espionage.

Volkman, Ernest. *The History of Espionage*. London: Carlton Books, 2007. An investigative reporter and former executive editor of *Espionage* magazine provides an overview of spying from ancient times to the world after the terrorist attacks of September 11, 2001.

Weiner, Tim. *Legacy of Ashes: The History of the CIA*. New York: Doubleday, 2007. A Pulitzer Prize-winning *New York Times* correspondent uses archives and interviews with CIA insiders (such as former chiefs Richard Helms and Stansfield Turner) for this history of the agency. Weiner argues that the CIA has, in the main, done more damage than good when it became distracted by gadgetry and covert actions under presidential influence while neglecting its mission to provide accurate intelligence.

Wise, David. *Nightmover: How Aldrich Ames Sold the CIA to the KGB for $4.6 Million*. New York: HarperCollins, 1995. Wise, an acclaimed espionage expert, rehearses the Ames case and the mole-hunt team that brought him to justice. The damage inflicted achieves a human dimension as Wise tells the tragic stories of the CIA operatives whom Ames identified.

Gregory Moore

International Arms Trade

Overview

The international arms trade exists for weapons to be made in one country and sold for use in another country or occasionally to be transshipped to a third party. The reason for this has often been that the source country has an extensive manufacturing capacity, usually for high-grade weapons, or that it is not possible to manufacture weapons in the country where they will be used. A third sector of the international arms trade follows a conflict when unused weapons may be sold to another party.

Significance

Since ancient times, the international arms trade has been very important, because if one side in a conflict has access to better weaponry, that gives them the military edge in conflicts. Also in terms of the money spent on weapons, it has been estimated that some 2 percent of the world's gross domestic product is spent on weaponry, leading to the emergence of a military industrial complex. In 2007, it was estimated that nearly $33 billion (in U.S. dollars) was spent on weapons in that year. In 2008, that amount declined significantly, to about $14.3 billion, and by 2009 it was expected that the financial constraints on many countries would continue to cause a diminution of the international arms trade. However, the arms trade will remain important for military as well as economic reasons well into the foreseeable future.

History of the International Arms Trade

Ancient World

There is much evidence that there was an extensive international arms industry during ancient times. Much of this concerned the development of particular armaments, notably the use of bronze and then iron. When the metal was developed in one area, entrepreneurs were involved in selling some of the weapons in rival countries. This was certainly the case with the introduction of iron (used by the Hittites) into ancient Egypt. It has also been suggested that the spread of the technology associated with iron helped transform the African continent, leading to small groups of people able to dominate particular societies in central, east, and southern Africa.

The largest military powers in the ancient world—the Assyrians, Achaemenid Persians, Macedonians, Carthaginians, and Romans, as well as the armies of ancient China—had to ensure that they held the military edge over their opponents, and this often involved the purchase of weapons or the materials to make weapons (such as tin from Cornwall or from Southeast Asia) to help furnish the large war machines. For example, items that could be easily transported, such as battleships, had to be made near the source of the materials (here, wood) required for their construction.

Animals were used in war in the ancient world, and the procurement and then the training of animals often involved significant cross-border trade. Such animals included war elephants, horses, and camels. As part of the international arms trade in the ancient world (a situation that has continued through to the present day), trained personnel were hired by a second country to accompany particular armaments to ensure that they were used correctly. This was often the case with siege machines, but also with simple weapons that required a particular skill, such as the Balearic slingers and crossbowmen in China.

Medieval World

Greater trade in medieval times allowed for the increasing manufacture of weapons, and the decline in the large empires and creation of city-states led to changes in the international arms trade. Some parts of Europe—especially northern Italy and central Ger-

many—became favored locations for the manufacture of armor, both for its durability and for its style. It became customary for members of royal families and the nobility to import armor from these places, as is evident in armories around Europe and the Mediterranean.

The Crusades led to increased manufacture of weapons for export, with the Knights Templar and the Knights Hospitaller both stockpiling within their castles in the Holy Land large numbers of weapons manufactured in Europe. It has been suggested that the wealth of these two Crusader orders led to the largest-scale mass manufacture of weapons since the end of the Roman Empire. Their enemies, the Seljuk Turks, developed the use of Damascus steel, a technology that was heavily guarded, but this secret did not prevent many rulers in the Middle East, the Mediterranean, and northern India from wanting to equip their armies with weapons made from Damascus steel.

Gradually within Europe, in the German and Italian states, the emergence of an arms industry led to the manufacture for sale of crossbows and later artillery—and in the early modern period, harquebuses. The need to have trained soldiers using them led not only to the purchase of the weapons but also often to the hiring of mercenary bands. It was essentially the development of firearms from the harquebus that led to the international arms trade as it is today.

Modern World

In the early modern period, the heavy use of firearms by one side over the other gave the side that possessed them such a major military advantage that it rapidly became necessary for all armies to be re-equipped with such weaponry. Because of the complicated nature of firearms manufacture, some craftsmen specialized in making firearms, which were then sold to armies and paramilitary groups. As a result, the international sale of such weapons spread throughout the world, equipping armies, often with weapons sourced from a range of countries. During periods of particularly fierce hostility—such as the Wars of Religion in France from 1562 to 1598, the Thirty Years' War (1618-1648), and the English Civil Wars (1642-1651)—the need for firearms and also gunpowder led to a lucrative trade in which neutral countries or states recognized that they could make fortunes in the provision of firearms and cannons.

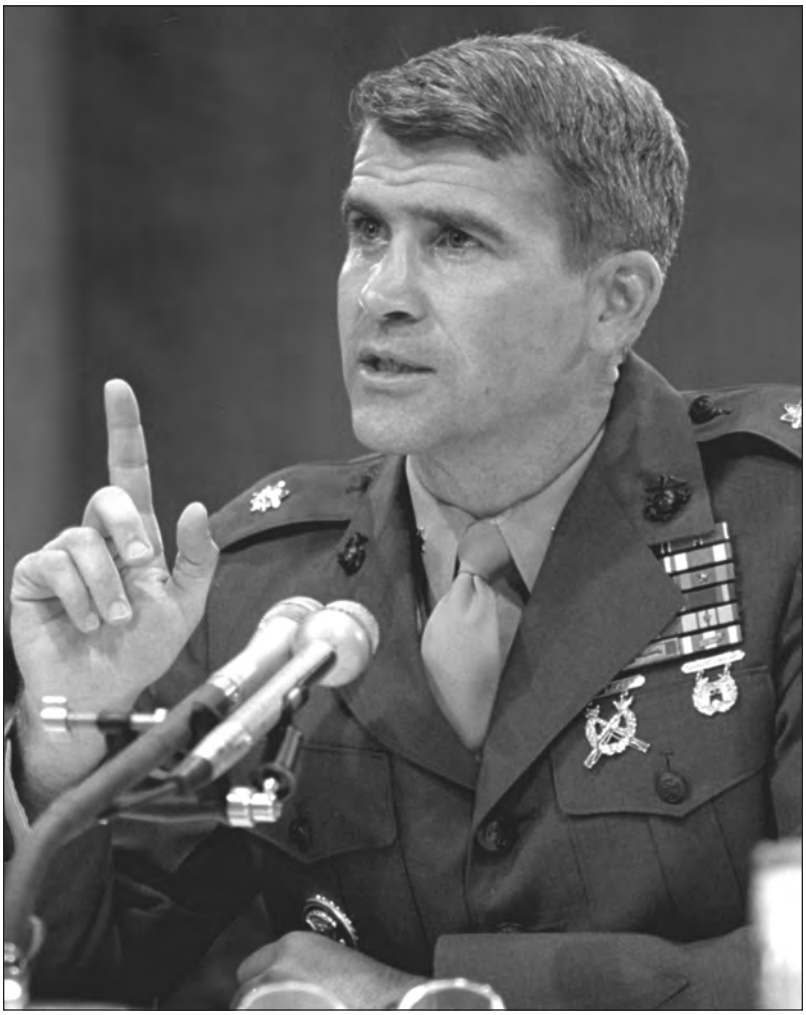
The provision of large standing armies in Europe during the late seventeenth and early eighteenth centuries led to the uniform equipping of entire armies. As a result, many major countries began to establish their own arms industries, which quickly developed the ability to sell surplus weapons to other nations. After the major wars of the period—the War of the Spanish Succession (1701-1714), the War of the Polish Succession (1733-1735), the War of the Austrian

U.S. Marine Corps

An AK-47 rifle, one of the most popular weapons of the international small-arms trade.

Succession (1740-1748), and the Seven Years' War (1756-1763)—there was often an abundance of weapons at the end of fighting, and this generated an arms industry of its own.

Many of the weapons were sold to places that lacked the industrial capacity or manufacturing ability to make their own weapons—parts of North America, the Caribbean, South America, and Africa—and some groups able to buy weapons from Europe were able to create secondary empires of their own. The export of weapons to Asia led to a transformation in that continent, with some groups able to reequip their armies quickly and others unable to do so.



AP/Wide World Photos

Lieutenant Colonel Oliver North, a central figure in the Iran-Contra affair, testifies before a joint House-Senate panel in 1987. North, a Marine officer working for the National Security Council, was accused of directing a secret U.S. operation to sell arms to Iran and secretly diverting the profits to the Contras, a group trying to overthrow the government of Nicaragua. He was found guilty of crimes arising from the affair, but his conviction was overturned.

The French Revolution (1789-1793) and Napoleonic Wars (1793-1815) coincided with a period of industrialization in Europe, starting in Britain, which led to that nation's becoming one of the leading arms exporters. At the end of the Napoleonic Wars, it was the ability of people in South America to buy many of the surplus weapons that led to the successful wars of independence that saw the countries of South and Central America gain their independence—and for some of them, their own arms industries. By the mid-nineteenth century, British arms sales contributed significantly to the international arms trade. Although many of the weapons made were used throughout the British Empire, a large number were sold overseas.

Although companies had operated since medieval times making arms, the nineteenth century saw companies such as Blyth Brothers in Limehouse, London, start to focus heavily on manufacture of weapons for sale overseas. The arms industry soon came to be linked heavily with the foreign policy of the country in which companies were located. There was a worry that the weapons could be used against the armed forces of the manufacturing country. Thus the introduction of export permits generally resulted in bans placed on the sale of weapons to countries that were likely to go to war with that of the manufacturer.

By the late nineteenth century and early twentieth century, a number of major arms manufacturers had emerged. In Britain, Vickers and Armstrong (which subsequently merged) made goods ranging from small weapons to battleships. In Germany, Krupp and other major industrial firms, such as Blohm and Voss, dominated the German production. The manufacture of various machine guns, such as the Maxim gun and the Nordenfelt gun, also led to increased sales as countries again sought to rearm. In addition to the manufacturers themselves, there were dealers who traveled the world offering weaponry for sale. Such marketing efforts led men such as Sir Basil Zaharoff to be accused of causing wars.

After World War I, the press focused particularly on Zaharoff and the role he had played in that war. The international arms trade was denounced by speakers such as the Reverend Charles Coughlin in the United States, who linked war profits with the U.S. involvement in World War I. Profits from arms sales to other countries were denounced, as they helped encourage conflict, and the constant need to rearm as weapons became obsolete led to many countries being unable to afford to spend money for the welfare of their own people—a criticism that has continued to the present day.

The emergence of new nation-states after World War I helped increase the international arms trade. Some of the smaller countries were not large enough to manufacture their own weapons and were forced to acquire arms from overseas. This situation continued after World War II, with many countries gaining their independence. The constant reequipping of armies in Latin America and Africa by foreign arms dealers led to an emerging body of literature outlining the role played by the international arms trade. As well as the main manufacturers—the United States, the United Kingdom, France, the Soviet Union/Russia, and then China—there were a number of other countries that became heavily involved in the international arms trade, such as Czechoslovakia, Chile, Argentina, and also, because of their peculiar circumstances, South Africa and Israel. The latter two both manufactured their own weapons to prevent reliance on foreign imports, but to finance their arms industries, they began a trade in exporting their weaponry—with the added benefit to purchasers that the weapons had generally been tested in combat.

In the period from the 1960's to the present day, the international arms trade has continued to be an important part in the extension of the political and foreign policy goals of many countries. The sale of arms from one country to another tended to signify political support rather than a mere financial transaction, and similarly there were organized boycotts of sales of weaponry, such as the United Nations' sanctions on the apartheid government in South Africa. Countries and companies involved in breaching such sanctions were often blacklisted, as in the case of those who supplied the Iraqi government of Saddam Hussein in the run-up to Operation Desert Storm in 1991. As a result, many companies have become involved in the international arms trade, seeking to sell their weapons to countries that have difficult reputations and often selling those arms through middlemen in a country that can provide the requisite "end-user certificates" to prove that the weaponry is to be used by that country and not sold to another. This illegal sale of weaponry has led to the arming of militia and paramilitary groups around the world.

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Justin Corfield

Military Organization

Overview

Military organization refers to the way a nation-state structures its armed forces. Organization reflects the way a military perceives and develops its strategic mission and provides systematic command and control at the tactical level. An efficient organizational structure also includes administrative and logistical components, making the creation, maintenance, and application of effective military power possible. In order to understand organization, three major parts must be examined: the bureaucratic, usually centered in a nation's department of defense or ministry of war; the armed forces, usually breaking down into branches of service (cavalry, artillery, infantry) as well as unit relationships such as the battalion and division; and the command hierarchy/rank structure.

Significance

Understanding a nation's military organizational structure reveals a great deal about how a military perceives and seeks to accomplish its mission. The United States, for example, with a large industrial base, has a table of organization and equipment that seeks to maximize technology and avoid casualties. This is a logical outgrowth of the principles of the Enlightenment on which the United States was founded. The Vietnamese, on the other hand, have an organizational structure that reflects *dau tranh*, which emphasizes the need to carry the struggle to the enemy at all costs.

Additionally, in many societies, the rank system mirrors the social structure; for example, in the Prussian army the landed gentry, the Junkers, generally held officerships, while the enlisted ranks were the peasantry, who in civilian life worked under them.

History of Military Organization

Ancient World

The most famous of the Greek military formations was the phalanx—a mass of troops equipped with long spears or pikes. Each line, or *stoechis*, consisted of sixteen to twenty-five troops, and each phalanx was eight to thirty-two lines deep. The largest formation, the *taxis*, consisted of between five hundred and fifteen hundred troops and was commanded by a general. A general's council or a single commander in chief led the entire army, usually consisting of more than one taxis.

Military reforms by Gaius Marius in 106-107 B.C.E. standardized Roman military organization, training, and equipment and introduced a self-contained, combined arms unit, the legion, that could operate independently or as part of a larger army. Not simply reliant on mass, the legion could use a variety of tactics that enabled it to outmaneuver the unwieldy phalanx. While the composition of the legion varied widely, in general the basic unit was the *centuriate*, consisting of sixty to one hundred troops and commanded by a *centurion*. Two centuriates were a *maniple*, commanded by the senior centurion; six to eight centuriates formed a *cohort*, commanded by the senior centurions of the legion. There were ten cohorts per legion. The overall commander was the *legatus legionis*.

The centuriate consisted of heavy infantry, whose main weapons were the pilum, or javelin; a short sword, or gladius; and a heavy shield, which could be used to form a tight defensive line. Light infantry, the *velites*, were used to confuse and harass the enemy. In addition, cavalry, the *equites*, and auxiliary troops filled out the legion, giving it a strength of approximately 5,126 troops.

Medieval World

Medieval European armies reflected the social organization of their day. The elites in the armies, the

knights and heavy cavalry, generally came from the nobility or royal classes, and the common soldiery, the infantry, typically came from the peasantry. Most nobles and royalty did keep a retinue of professional men at arms, commanded by a sergeant at arms. Men at arms were generally expensive to maintain, and a king's ability to wage war depended greatly on the nobles who had sworn loyalty to him and the manpower they themselves could generate. With the exception of mercenary armies, which had a definitive command-and-control structure, most medieval wars were fought by armies that had strong social and political loyalties but little in the way of professional training or effective organization. The result was often disastrous. At the Battle of Agincourt in 1415, for example, the French outnumbered the English by three to one. Charles I d'Albret was unable to coordinate his reserves or his men at arms with the heavy cavalry effectively, and the result was a French defeat.

The French defeat underscored another important development in the medieval period: the rise of specialized, professional troops. English longbowmen, largely credited with the English victory at Agincourt, were highly trained. The inclusion of such troops could often turn the tide in battle, and in the Middle Ages the development of artillery—at first catapults, ballistae, and trebuchets but also battering rams and siege towers—gave an increasing edge to those armies that could afford them. By the eighteenth century, the development of cannons had created a specialized niche in European armies.

In the 1620's, the Manchus developed the four-banner system, which became the main organization for China (expanded to eight banners in 1642) until the end of the Qing Dynasty in 1911. Originally a means of controlling the Manchus, each banner became a means of civil administration after the establishment of the Qing Dynasty in 1644. In military terms, each banner army was independent and answered directly to the emperor. The smallest unit was *niru* (three hundred men). The next was *jalan* (consisting of five nirus), and five jalans constituted a *gusa* (banner). There were banners for the Manchus, the Han Chinese, and the Mongols. In 1631 a separate Chinese artillery corps was formed.

MODERN WORLD

The modern system of military organization can be traced to the French defeats in the middle of the eighteenth century. Maurice, comte de Saxe, the French general in Flanders during the War of the Austrian Succession (1740-1748), reorganized the French army into columns to be used to outflank and outmaneuver rather than annihilate an enemy. He also experimented with mixed arms units, combining cavalry, artillery, and infantry in a single operation. During the Seven Years' War (1756-1763), Victor-Maurice de Broglie (the duc de Broglie) published *Instruction pour l'armée du roi commandée par le maréchal duc de Broglie* (1761; instruction for the army of the king, commanded by the marshal the duke of Broglie), which separated the army into four divisions. Each division would have a quarter of the brigades under overall command, and a lieutenant general would command each. Each division would also be self-sufficient and have cavalry, artillery, and infantry resources at its disposal. This organization proved effective; however, de Broglie's system was dropped after his death, mostly because of pressure by noble officers who wished to preserve the French army as a bastion of privilege.

In 1772, the organizational ideas of Saxe and de Broglie were revived and developed by Count Jacques de Guibert, whose *Essai général de tactique* (*General Essay on Tactics*, 1781) called for a mixed formation of line and column depending on the tactical situation, a reform of the supply system, and an emphasis on speed. Artillery should be massed to concentrate on an enemy's weakest spot, and a reserve should be maintained. In 1779, the *Défense du système de guerre moderne* (defense of the system of modern war) developed these ideas further and called for a "nation in arms" that is, a nation willing and able to commit all of its resources to winning a war. Guibert's tactical ideas, and the organizational reforms they required, became the basis of a reformed French army, with one exception. The corps, consisting of two to four divisions and completely self-sufficient, was introduced by Napoleon in 1806. During the French Revolution (1789-1793) and the Napoleonic era, this army would conquer Europe and force all other European militaries to adopt similar organizational structures.

Modern military organization varies from army to army, but all have a similar outline. The basic unit of maneuver in the U.S. Army is the squad, consisting of five to seven troops. In communist armies, the three-man fire team is the smallest unit, but the squad remains the basis of operations. Each squad is led by a noncommissioned officer, usually a corporal or sergeant. Four squads make up a platoon, led by a sergeant first class and officered by a second lieutenant. Five platoons comprise a company, usually with one platoon devoted to heavy weapons, such as a mortar or heavy machine gun. Captains command companies.

Two to five companies are a battalion; three battalions are a brigade. In some armies, battalions are organized into regiments. In the U.S. Army, while each battalion retains its regimental identity, its organizational identity remains with the brigade to which it is attached. For example, the second brigade of an infantry division might contain First Battalion, Second Infantry Regiment; the First Battalion, Third Infantry Regiment; and First Battalion, Sixth Infantry Regiment.

Each brigade consists of infantry and armor elements. An infantry brigade consists of two infantry battalions and one armor battalion; an armor brigade consists of one infantry battalion and two armor battalions. There are usually two to three brigades in a division. The number of infantry to armor brigades determines if the division is infantry or armored. A colonel or brigadier general usually commands a brigade. A lieutenant general or major general commands a division.

In addition to the brigade structure, each division usually has an armored cavalry squadron, an aviation unit, and a divisional artillery battalion attached, in addition to transportation, logistical, and health/hospital services.

The company/battalion structure is for the infantry. Artillery units are organized into batteries rather than companies, and cavalry and armored cavalry units use troops rather than companies and squadrons rather than battalions.

Modern armies are still organized into corps, but usually by geographic locale. For example, most U.S. Army elements in Germany during the Cold War were part of VII Corps. An organization of corps is an army.

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Everett Dague

Strategy

Overview

Simply stated, military strategy is the planning, coordination, and implementation of a set of actions, or tactics, that are aimed at defeating the enemy in an individual engagement or in a war as a whole. Although many have written on the topic since then, it might have best been broken down in 1838 by the French general Antoine-Henri de Jomini:

> Strategy is the art of making war upon the map, and comprehends the whole theater of operations. . . . Strategy decides where to act; logistics brings the troops to this point; grand tactics decides the manner of execution and the employment of the troops.

Of course, within that definition, endless permutations are possible and, indeed, probable.

Significance

An understanding of tactics is essential for anyone seeking to develop a comprehensive evaluation of why wars have been won and lost. For example, if one seeks to understand why the Nazis lost World War II when they seemed to have achieved such a stunning victory so early in the war, a look at Adolf Hitler's war strategy, and specifically his fascination with waging war against the Soviet Union, is absolutely crucial. In the modern world, military strategy may not be the only factor in determining the outcome of a conflict, but it remains a vital field of inquiry by generals and historians alike.

History of Tactics

Ancient World

Although wars have been fought dating to ancient times, one of the most influential early codifications of the principles of military strategy was written around 500 B.C.E. by the Chinese philosopher Sunzi (Sun Tzu) in his *Sunzi Bingfa* (c. fifth-third century B.C.E.; *The Art of War,* 1910). In this masterwork, Sunzi developed thirteen principles of military strategy, devoting a chapter to each. These included calculations, doing battle, planning attacks, formation, force, army maneuvers, ground formation, fire attacks, and using spies. His ideas have influenced many throughout the world and still are read today.

In the West, military strategies developed along with the rise and fall of civilizations over the millennia. Though the ancient Sumerians and Greeks developed strategies to defeat their enemies, the development of strategies reached a high point with the Macedonian leaders Philip II (382-336 B.C.E.) and his son Alexander the Great (356-323 B.C.E.). Philip II tactically utilized infantry and cavalry together to weaken his foes and, in concert with large-scale planning and long-distance communication, expanded his empire. Using a large-scale strategy that employed both warfare and diplomacy, Philip was able to unite most of the city-states of Greece in his League of Corinth. Picking up where his father left off, Alexander took his father's tactical and strategic innovations and employed them on an even larger scale, dominating much of the known world during his brief lifetime, expanding the Macedonian Empire by driving northward into Europe, southward into Egypt, and eastward, conquering the entire Persian Empire. Alexander employed surprise, meticulous planning, and effective communication as a means of implementing his strategies.

The Carthaginian commander Hannibal (247-182 B.C.E.) is generally considered to have been both a brilliant tactician and a supreme strategist. Facing the Romans in the Second Punic War (218-201 B.C.E.), Hannibal developed a victorious strategy that can be seen not only in such battles as the one at Cunnae (216 B.C.E.), but also, in a larger sense, in his complete reorganization of the Roman Army to deal with

the forces and strategies that he innovated. Luring the Romans into engagements in terrains where he knew his forces had an advantage, Hannibal came closer than anyone else in the ancient world to conquering Rome. Eventually, however, the Roman general Quintus Fabius Maximus employed his own strategy, specifically designed to wear Hannibal down gradually by cutting off his supply lines, engaging him only in small skirmishes that diverted his attention, and avoiding a direct conflict with his powerful army.

The Roman emperor Julius Caesar (100-44 B.C.E.) was the first Roman to combine civil and military power, so that he could implement his strategic vision with both the political and military arms of the Roman government. Following a war of conquest through Italy that consolidated his power, turning the Roman Republic into the Roman Empire, Caesar executed his brilliant conquest of Gaul, not only cutting off his opponents' military supply lines but also patiently waiting until they had exhausted their water supply. Fear of Roman power was implemented ruthlessly as a strategy, as he often cut off the heads of surviving opposing soldiers as a warning to others not to rebel against Rome.

Medieval World

During the seventh century C.E., it was the Islamic world that was expanding, and that expansion was largely directed by the Prophet Muḥammad's greatest general, Khālid ibn al-Walīd (died 642 C.E.). After honing his strategies in helping Muḥammad expand his new religion throughout the Arabian Peninsula, Walīd oversaw the invasion and conquest of both the Persian Empire and the Roman province of Syria within three years. Seeking to fight against many smaller foes before they could unite into a large army, Walīd defeated tribes seeking to escape the Muslim hegemony. Planning attacks from multiple sides while making sure that there were no enemies on his own flanks and marching his own forces through inhospitable deserts that his foes thought he could not, he completed the conquest of Persia in 633 C.E. and of Roman Syria the following year.

The early medieval period was a low point in the application of strategy in Europe, as the feudal system gradually dominated, with its emphasis on defense, castles, and sieges. However, to the east, the Mongol leader Genghis Khan (c. 1155 or 1162-1227) employed psychological strategies of terrorizing his opponents into submission. By implementing a scorched-earth policy along with mounted archers and cavalry, Genghis conquered Arab, Persian, European, and Asian armies with his highly mobile forces and revolutionized warfare with the rapidity of his movement. Using terror and biological means to subdue fortified cities, successor khans kept order through terror as well.

New technologies such as the longbow and gunpowder inevitably changed the character of European warfare during the late medieval period, but if there was one person who truly bridged the medieval and modern periods, it was Gustavus II Adolphus (1594-1632) of Sweden. In the Thirty Years' War (1618-1648), Gustavus pioneered strategies that led to victories over the forces of the Holy Roman Empire. Maintaining infantry and cavalry with mobile artillery and logistics in coordinated attacks, Gustavus used nationalism and a standing army to create and expand the Swedish Empire into the third largest nation in Europe, behind only Spain and Russia. Like Genghis Khan, he used maneuverability to create a very aggressive military strategy that downplayed defense and overcame the stagnant and static medieval fortifications and other defense strategies, utilizing the new firepower of carbines and artillery to great effect.

Modern World

During one of the first wars of the modern era, the Seven Years' War (1756-1763), Frederick II of Prussia (Frederick "the Great," 1712-1786) began the transformation of war based on small-scale engagements to one based on large, expansive strategies that required massive logistical support and a highly disciplined, maneuverable army. Employing the basic tenets of modern warfare, the concentration of forces at a weak point along the lines of his opponent, Frederick used artillery to soften the lines in advance of his assault. Pressing his attack in order to exhaust his opponents and fighting off multiple opponents by keeping his forces extremely mobile within his own

interior areas, Frederick employed strategies that took advantage of his knowledge of the terrain and the best ways to exploit it to create weak points in his opponents' forces.

However "great" Frederick was, his legacy, and most others', pales in comparison to the giant of military strategy in the early modern world, Napoleon Bonaparte (1769-1821). Despite the growth in the size of armies because of the implementation of conscription, Napoleon was able to implement high maneuverability to achieve a strategy of scorched earth and terrorized civilian populations. The mobility of Napoleon's forces allowed him to dictate the order of battle, where his opponent would be enticed to strike, and how to find his opponents' weakest points to win the battle. Cutting his opponents' supply and communication lines sped their defeat. Warfare based on lines of soldiers was shown to be ineffective in the face of Napoleon's cavalry surrounding the lines, cutting them off from their reserves. With the judicious use of mobile forces in strategic locations, Napoleon was routinely able to defeat much larger, linear forces. Perhaps no greater compliment can be paid to Napoleon's strategies than to note that they inspired the rise of the study of military strategies, which saw the first two modern masterworks of military strategy, Carl von Clausewitz's *Vom Krieg* (1832; *On War*, 1873) and Jomini's *Traité des grandes opérations militaires* (1805, 5 volumes; *Treatise on Grand Military Operations*, 1865).

Napoleon also influenced later military strategists during the American Civil War (1861-1865), such as Union generals Ulysses S. Grant and William Tecumseh Sherman and Confederate generals Robert E. Lee and Thomas "Stonewall" Jackson. However, advances in technology meant that the weapons of war were much more efficient and could fire much more rapidly, necessitating larger-scale strategies that could be implemented only by the political leaders of the belligerent nations. The impact of communications technologies, such as the telegraph, allowed political leaders to work more directly with military commanders. Working with the Union's political leaders, Grant and Sherman used scorched-earth strategies and highly mobile forces, along with naval blockades and the destruction of supply and communication lines, to surround Lee's forces and bring about the end of the war.

If the technological changes of the nineteenth century revolutionized military strategy, by the early twentieth century consistent change in military technology would continue to transform strategies with each and every large conflict. At the beginning of World War I (1914-1918), the forces implemented strategies learned from the conflicts of the late nineteenth century, only to be overwhelmed by the large artillery pieces developed. This necessitated the retreat of forces on both sides into trenches, which would characterize the rest of the conflict. World War II would see the addition of the elements of powerful tanks and airpower, resulting in massive tactical and strategic, and eventually atomic, bombing, again necessitating massive changes to war strategies. However, a return to an emphasis on mobility and concentration of forces accompanied the new technologies. The unified German forces (Wehrmacht), acting under Hitler's directives, implemented Blitzkrieg (literally, "lightning war"), a sudden, surprise attack of overwhelming force, often employing coordinated air and ground forces—which proved to be an extremely effective offensive strategy. Fortunately, Hitler's fixation on the conquest of the Soviet Union proved to be his undoing.

With the hesitancy of the United States and the Soviet Union to engage directly during the Cold War (1945-1991), for the latter half of the twentieth century warfare took a less technological turn, as exemplified by the conflict in Vietnam from the 1950's to the mid-1970's. Despite massive technological superiority, guerrilla warfare caused the United States to employ a series of unsuccessful strategies, causing frustration not only among soldiers but among the American public as well. Guerrilla warfare dominated many of the small-scale conflicts of the last half of the century, especially in locations where the landscape lent itself to easy concealment.

Technology came to the fore once again with the two Gulf Wars of the 1990's and 2000's. The use of so-called smart bombs and the massive implementation of the "surge" in Iraq—a significant influx of "boots on the ground"—led to military superiority in Iraq, although the lessons of Vietnam continue to be taught, in

that indirect, small-scale engagements by a force committed to a conflict by ideology or religion can keep a large, technologically advanced force off its stride, extending a conflict until the superior force, or the nation behind it, tires of the conflict and withdraws.

The counterstrategies employed by insurgents and ideologically driven guerrillas have fallen under the rubric of "terrorism," which expands the war from the arena of the battlefield to all areas of daily life, in a strategy that employs any tactic necessary—from the hijacking of civilian airlines to their use as projectile bombs to car-bombings of hotels and cafés to suicide bombings—to wage psychological as well as ideological war. The strategies of terrorism encroach on the entire fabric of a society by diverting that society's resources to long-term (not just temporary) counterstrategies involving heightened security in order to ensure safety in transportation, trade, and other economic and civic infrastructures. Time will tell if a military strategy is ever developed to overcome a small-scale, guerrilla army that wages a war on ideological grounds.

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Steven L. Danver

Tactics

Overview

Military units preparing for and in battle are governed by the overall *strategy* of the campaign. All component elements of a military force in a campaign maneuver fight within an operational plan. At the sharp end (in contact with the enemy), all personnel use *tactics* to achieve their aim—in movement around the battlefield, in defense, and in attack.

Significance

To a great extent, tactics have always been influenced by the technology available at the time. From rock to rifle to rocket, tactics have evolved to use what is available to inflict the most damage on the enemy while preserving lives on the user's side. The evolution of battlefield weapons and their increasing range and power have affected tactics directly. Another significant factor in tactics is mobility: Both defenders and attackers need to be able to move freely about the battlefield; failure to maintain freedom of movement can easily lead to defeat.

History of Tactics

Ancient World

Tactics are governed by weapons to a large extent, and the range and firepower of those weapons. In the period of early warfare, available weapons were limited in range to below the total range of vision. This meant that anyone out of range of bow or catapult was safe to move. Tactics developed to bring the enemy within range by maneuver and speed of deployment.

Weapons available in the pre-firearm period included the sword, bow and arrow, spear, javelin, lance, and siege engines. Men en masse on foot moved slowly and were difficult to maneuver once a battle had begun. The answer was to mount some men on horses, giving them a greater speed on the battlefield and a greater range on reconnaissance.

Cavalry became, as training and tactics improved, the masters of the shock effect. Horses could be trained and could attack en masse, and a cavalry charge was very effective in breaking the ranks of defending infantry. Initially the defenses against cavalry were limited to spear, pike, and bow; it was the bow that finally began the decline of cavalry, for well-trained archers were capable of breaking up a cavalry charge long before it reached the defender's front line.

For the defender, one of the best protections was walling and towers, the castle, keep, fortified town, or house. Tactically the defender has the advantage in that he has internal lines of communication (and therefore freedom of movement), and the static defenses of thick walls and towers often defeated the attacker. Here, however, technical developments led to the invention and development of siege engines of considerable power, capable of slowly but finally demolishing even the thickest walls. Other tactical methods of defeating the wall including mining underneath it.

The art of static defenses reached its peak with the detailed designs of Sébastien Le Prestre de Vauban (1633-1707), although the very last such constructions were seen as late as the twentieth century in the Maginot line (named after André Maginot, 1877-1932) in eastern France and similar defensive works.

Medieval World

The arrival of firearms on the battlefield further limited the effect of cavalry, although initially the range and firepower of these early weapons were limited, and musketeers were normally protected from cavalry by pikemen, who stood to their front.

The first military firearms were designed perhaps more to frighten the horses than to have killing effect. Both handheld and heavier weapons were developed,

and cannons served well to reduce static defenses. The rate of fire, accuracy, and general effect of the weapons was limited, but technology made great strides in improving the characteristics of these equipments.

Tactics throughout the ages have always been crucial in determining how much damage each side can do to the other in battle. The side with the most soldiers and the best weapons could normally be expected to prevail, but there are occasions when small groups that were better armed and equipped were able to inflict disproportionate damage on much larger forces. The use by the British army of machine guns in nineteenth century colonial warfare and the Spencer rifle (invented by Christian Spencer in 1860) in the American Civil War are examples of this.

MODERN WORLD

In the nineteenth century, changes to firearms began to create a need for changes in tactics. Firearms became more effective. The rate of fire was increased, accuracy improved, and the arrival of the breech-loading rifle, the machine gun, and quick-fire cannon would affect tactics more rapidly than had been seen before.

Breech-loading rifles meant that no longer did infantry have to stand to fire; earlier muzzle-loaded weapons had to be reloaded with the soldier standing up. The ability to reload lying down meant that infantry were less obvious on the battlefield and hence better protected against enemy cannon fire. Defenders began to dig into the ground to lower their silhouettes and to protect themselves even more, and attacking infantry had to move toward the enemy across ground that was covered by the defenders' fire.

The cannon on the battlefield had, for a long time, been limited in effect by its lack of maneuverability, but manufacturing techniques slowly overcame this problem and guns were soon able to keep up with the cavalry by being horse-drawn on highly mobile and stable carriages. Breech-loading methods improved the rate of fire, higher standards of manufacture increased accuracy, and the cannon became the field gun with considerable effect upon bodies of troops present on the battlefield.

The invention of the machine gun spelled the end of massed troop formations, although this was not fully understood in the nineteenth or early twentieth century. Units with machine guns issued to them often failed to use them, despite the obvious advantage of a high rate of sustainable fire, still preferring to fight battles with verve and élan rather than brains.

World War I (1914-1918) saw the technology of war show how utterly ruthless it could be against masses of men. No matter how great the attacker's superiority in numbers, machine guns, artillery, and barbed wire spelled the end of millions of lives. The problem for the tacticians of this war was that technology had supplied weapons of defense that were far superior to the weapons of attack. In most cases, the attackers were armed simply with rifle and bayonet and were faced by increasing numbers of defending machine guns, deep belts of barbed wire, and artillery defense plans that left the attackers dead and dying in front of the defending trenches.

Trenches in World War I were redolent of the earlier wall defenses of the Middle Ages and earlier. Siege warfare existed between the two sides on the western front, and although major attacks were made, they failed in the main in the first three years of the war because the defender had the advantage, although it must also be recognized that the more senior officers on both sides (particularly the British commander, Field Marshal Douglas Haig, Viscount Dawick) were still convinced of the value of cavalry (against machine guns, barbed wire, and guns) to make the breakthrough and develop the attack into a rout. This was simply impossible. What was needed was a breakthrough weapon.

That weapon was the tank. Invented by the British, and much promoted by Winston Spencer Churchill, the tank was seen to be capable of breaking through the enemy defenses unscathed, and accompanied by infantry, to lead the breakthrough into the enemy gun lines and rear, whereby victory would be won. However, technology here lacked the ability to provide sufficiently reliable tanks, and the defenders soon realized that they could fight against tanks. Nonetheless, the idea bore eventual fruit and led to the infantry-tank warfare of World War II.

Once more, tactics were to undergo changes to in-

corporate the new tanks and the very new concept of air power. The Germans demonstrated their new tactics in Poland, Denmark, Holland, and France in 1939 and 1940, and it seemed that there was no real answer to Blitzkrieg. The combination of infantry, tanks, artillery, and aircraft caused a remarkable effect on the battlefield. The "empty battlefield" of World War I became even more essential in this war for the reason that movement, concentrations of troops, and defensive positions were all vulnerable to air attack, shelling, or an infantry tank attack combined with supporting weapons.

The pace of tactics had changed dramatically; no longer did battles proceed at the pace of the infantry but rather at the speed of the motor vehicle (and later, with the arrival of paratroops and "vertical envelopment," at the speed of the aircraft). The need for rapidity of movement now became paramount, and infantry, to keep up with the tanks, had to be carried in trucks—or, better still, in armored personnel carriers, a concept of Sir Basil Henry Liddell Hart (1895-1970) and Major General John F. C. Fuller (1878-1966), completely adopted by the Germans, especially Colonel General Heinz Guderian (1888-1954). Artillery also needed to move faster, and so was towed or even self-propelled in semiarmored vehicles.

Tank battles were fought tank against tank, but by the side of this was a developing ability for the infantry to destroy tanks themselves with easily movable antitank guns and, later in the war, man-portable "fire and throw-away" antitank weapons, as well as the "bazooka" and similar weapons. Tanks were becoming hunted as well as hunters.

In the air, enormous strides were made in developing weapons to make air-ground cooperation a reality. Initially air support was provided by, for example, the Junkers Ju87 Stuka dive-bomber. In the course of the war, rocket-firing aircraft could knock tanks out, and even strategic bombers were used (sometimes not very effectively) to aid ground troops.

Modern tactics are a combination of the well-tried and -tested fire and movement technique (some men fire at the enemy, while the others move forward tactically) and a mobility that is fundamental to gaining surprise on the battlefield. The delivery of troops unexpectedly on the battlefield was always a great contributor to success; paratroops were used for this purpose, but nowadays air-landed troops (from aircraft or helicopter) can often tip the scales in favor of the side using them (whether as attacker or defender).

Infantry are now almost invisible on the battlefield, whether moving or in defensive positions; night as cover has disappeared with the appearance of light-intensification and infrared equipment, and tanks can engage the enemy by heat signature alone. Artillery can deliver devastating, concentrated fire, which will totally demoralize any defender.

In the air, target identification sometimes remains a problem, but the delivery capability and capacity are tremendous, and one aircraft can drop a payload of immense value to the troops on the ground. Airlifting troops both to make an assault and to put "boots on the ground" can proceed so quickly that rapid buildups of troops are possible in a very short time.

Tactics seem to have developed out of all recognition, but in fact they remain the same: to engage the enemy on the battlefield and to defeat him. If anything, tactics are very personal to soldiers, because if the tactics are effective they will kill the enemy; if not, then they will be killed. Only the technology has changed, meaning that speed is now of the ultimate essence: speed of movement, rate of firepower, speed in gaining and using intelligence, speed in reacting to enemy threat. On the ground, however, it all comes down to getting into such a position that defeat of the enemy can be achieved. When it comes down to the basic level, it is the soldier on the ground who counts, and if the tactics are faulty or the training deficient, then soldiers will die.

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the theory of warfare, Clausewitz's treatise not only is classic but also remains current. The paperback edition of this translation offers a useful index.

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Steiger, Rudolf. *Armour Tactics in the Second World War: Panzer Army Campaigns of 1939-41 in German War Diaries*. New York: Berg, 1991. Primary documents form the basis for this description of World War II tank tactics, with particular emphasis on Operation Barbarossa, based on the files of the Germans' second Panzer Army.

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David Westwood

RESEARCH TOOLS

War Films

*The following films are important in the study of military history. They are selected for their value in representing the conflict and/or the period in question, and they are arranged in roughly chronological subsections, within which they are arranged alphabetically by title. An * (asterisk) denotes a foreign production; a ^ (caret) denotes a television production.*

Ancient Greece

Alexander
Released: 2004

Alexander the Great began his conquest of the known world in 334 B.C.E. His Asian campaign, which pitted his Macedonian army against Persians, Bactrians, Scythians, and East Indians, lasted until 326 B.C.E. Unfortunately, of the myriad battles and sieges he fought, *Alexander* depicts only two: Gaugamela (331 B.C.E.) and Hydaspes River (326 B.C.E.). The decision to emphasize Alexander's personal life robs the film of much of its value as a war film; however, there are few other films about the campaigns of Alexander. The film is successful in accurately portraying the scale of the massive Battle of Gaugamela, arguably Alexander's most important victory, while close-up shots are excellent in portraying the Macedonian phalanx in battle, as well as the extent to which Alexander relied on his cavalry.

The 300 Spartans
Released: 1962

In 480 B.C.E., during the Second Greco-Persian War, three hundred Spartan warriors under King Leonidas held off the advancing Persian army of Xerxes at the Battle of Thermopylae (480 B.C.E.). While much older than the more recent release of *300* (2006), *The 300 Spartans* is much more objective in its portrayal of both the battle and the two armies involved (although neither film makes mention of the Spartan enslavement of the Helots, while at the same time depicting the battle as one of freedom versus slavery). The more recent film has a better depiction of phalanx warfare, as well as an explanation of the Spartan *agoge* and warrior culture, but its depiction of the Persians as beasts and demons makes *The 300 Spartans* a better choice.

Ancient Rome

Spartacus *and* **Gladiator**
Released: 1960 and 2000 respectively

Taken together, these films provide an accurate depiction of the Roman legion and Roman warfare. Though the former is primarily fiction and the latter is based on the Third Servile War (73-71 B.C.E.), each nicely complements the other. *Gladiator*'s opening battle scene shows the Roman legion in action up close, while the battle scene at the end of *Spartacus* shows an absolutely astounding portrayal of legion tactics and maneuvers from a distance. In addition to their depictions of warfare, both go into some detail in portraying the politics of Rome and, of course, the role of Roman blood sports. Which film is superior is a matter of preference.

Middle Ages and Crusades

Alexander Nevsky*
Released: 1938

The Battle of the Ice (also known as the Battle of Lake Peipus) took place in 1242. It was fought between the Teutonic Knights and the Republic of Novgorod as part of the northern Crusades. Alexander Nevsky led the Novgorod army to victory against the invading Teutons on the frozen lake. The climactic scene comes when the weight of armored knights

becomes too much for the ice to bear and the Teutons break through, drowning under the ice. This film, a Soviet production, is not only a masterful piece of propaganda but also one of the first epic war movies. It is a useful film both because of the period it depicts and because of the period that created it.

Braveheart
Released: 1995

Mel Gibson's film about the life of William Wallace is both a blessing and a curse. Historically speaking, *Braveheart* is plagued with many significant inaccuracies, something Gibson acknowledged as necessary in order to enhance cinematic value; however, *Braveheart*'s numerous battle scenes (Stirling Bridge, 1297; Falkirk, 1298; and Bannockburn, 1314) are massive, intense, and thoroughly engaging. They also provide a depiction of a major turning point in military history: the use of pikes by infantry to defeat charging cavalry. *Braveheart* is a good visual supplement for study of the Scottish Wars of Independence.

Henry V
Released: 1989

On Saint Crispin's Day, 1415, Henry V of England took the field against a French army twice as large and made up of mounted knights, yet at the end of the day the English had won a decisive victory. The Battle of Agincourt, as it is known, is one of the most important battles in history because it demonstrated that, armed with longbows, peasant infantry could defeat cavalry, thus threatening the social hierarchy of Europe. The entire film traces the events leading up to the battle, the battle itself, and the battle's significance. Though the battle scene is only a fraction of the film, it aptly depicts the impact of both the longbow and the thick mud that covered the field and hindered the French against their lighter-armored opponents. Because the film is based on Shakespeare's play and follows it closely, the language will be difficult to follow for some. Kenneth Branaugh (Henry V) and his fellow actors, however, bring both language and action to life.

Kingdom of Heaven
Released: 2005

Beginning in 1095, the Crusades served as a centuries-spanning source of conflict between Christian and Muslim. In 1187, Saladin the Saracen laid siege to the city of Jerusalem, which was defended by an army under the command of Balian of Ibelin. *Kingdom of Heaven* tells of Balian's rise to the status of noble and Crusader, his journey to the Holy Land, and his unsuccessful defense of Jerusalem. The film provides a nice visual portrayal of medieval warfare, especially siegecraft, and reveals some of the complex politics involved in the governance of the Crusader states.

The Messenger
Released: 1999

Joan of Arc is one of the most famous individuals in French history. Her victory at Orléans in 1429 marked a turning point in the Hundred Years' War (1337-1453) between England and France. *The Messenger* not only provides a brief but adequate background to the Hundred Years' War, along with good visuals for medieval warfare and siegecraft (particularly the use of the culverin), but also explores Joan's mentality, visions, and belief that she was chosen by God to push the English out of France.

FEUDAL JAPAN

The Last Samurai
Released: 2003

This film is a double-edged sword. On one side, it is an excellent portrayal of the Japanese transition from feudal warfare and weapons to those of the modern age, intermixing the social, military, and political consequences of the transition. The film's portrayal of the Japanese warrior code of bushidō and its many battle scenes are tremendous; however, the portrayal of the opposing sides is too skewed (as in *The Patriot*). The Japanese samurai and peasants are shown to have had a perfect life until those awful, modernizing Western nations came along. However, if one can look past the revisionist history, the film has a lot to offer.

Ran*
Released: 1985

Ran is an excellent film for bringing feudal Japanese warfare to life. The film offers excellent visuals, both in its epic battle scenes and in its beautiful costumes. The battle scenes, though sometimes gory to the point of being comedic, accurately depict the formations, tactics, and weapons of the Japanese warlords, in particular their use of the harquebus. The introduction of firearms is a pivotal point in military history, and the film shows why. *Ran* is also useful in depicting the samurai warrior code of bushidō. The film's only real drawback is that it is based on William Shakespeare's *King Lear* (c. 1605-1606) and therefore is not historically based.

Thirty Years' War

Alatriste
Released: 2006

In the most expensive Spanish-language production to date, based on the series of novels by Arturo Pérez-Reverte *Las aventuras del Capitán Alatriste* (1997-2006; the adventures of Captain Alatriste), a quarter century of the seventeenth century Spanish Empire and religious wars are depicted, including the Battle of Rocroi (1643).

The Last Valley
Released: 1970

Despite its enormous importance to history, the Thirty Years' War remains a scantly used setting for war films. *The Last Valley* is one of the few existing films to be set during the war, and although there are no epic battle scenes, the film provides a good visual context for the viewer and does contain one battle scene, which provides a basic depiction of seventeenth century warfare. Additionally, the complexity of the political and religious aspects of the war, especially religious zeal, are nicely conveyed through the interaction and dialogue of the characters.

English Civil Wars

Cromwell
Released: 1970

England is locked in civil war. Forces loyal to King Charles I fight against the armies of Parliament, led by Oliver Cromwell. This film covers the entirety of the war, from its earliest causes clear through to the execution of Charles and beginning of the Interregnum. Its numerous battle scenes are impressive both in scale and in detail, showing the pike-and-shot tactics of the time period. The largest battle scene depicts the Battle of Naseby (1645) and the Loyalist defeat at the hands of the New Model Army (another important aspect of the war that is treated in adequate detail in the film).

French and Indian War (Seven Years' War)

The Last of the Mohicans
Released: 1992

Based on James Fenimore Cooper's novel, *The Last of the Mohicans* is set during the Seven Years' War (known in North America as the French and Indian War). The plot is set in the American colonies and revolves around the successful French siege of Fort William Henry (1757) and the subsequent massacre of the retreating British troops by some of France's Indian allies. Containing battle and siege scenes, *The Last of the Mohicans* vividly portrays colonial-era warfare. The ambush scene near the end of the film is especially useful in illustrating the differences between the unconventional tactics employed by the Indians and their effectiveness against traditional European-style fighting. The only drawback is that it covers only the war in the colonies when the war was truly global.

AMERICAN REVOLUTION

April Morning
Released: 1988

The film adaptation of Howard Fast's novel, this better-than-average portrayal of the beginning of the war depicts a boy's coming-of-age as the colonists stand up to the British on Lexington Green.

Drums Along the Mohawk
Released: 1939

Newlyweds settle in the Mohawk Valley just as the revolution is erupting, and the young husband goes off to war; the film ends on a bright note with the birth of a new nation. Though a fictionalized and sentimental chronicle, this classic, directed by John Ford, offers a rich depiction of frontier life during the war. Props had to be made from scratch, and many are true to historic detail. Flintlock muskets, however, were those actually used during the era—the prop department tracked them down in Ethiopia, where they had been used to fight the Italians during World War II.

John Adams^
Released: 2008

Based on the book by David McCullough, this acclaimed biographical television miniseries (HBO) chronicles Adams's role as Founding Father, including the Revolutionary War period, beginning with the Boston Massacre.

Johnny Tremain
Released: 1957

The first adaptation of Esther Forbes's novel portrays the beginning of the American Revolution from the perspective of a young man whose views on the war change as he evolves into a revolutionary. Emphasizes the human perspectives on the war, from both sides.

The Patriot
Released: 2000

As a film about the course and causes of the American Revolution (1775-1783), *The Patriot* falls flat. It is too critical of the British, too praising of the colonists, too focused on the southern theater of war, and too idealistic in its depiction of race relations and slavery. However, the film is accurate in its portrayal of the military aspects of the war, particularly the difficulties of the Continental Army in maintaining adequate numbers and discipline. While the character of Benjamin Martin is so perfect that he is unbelievable, he is loosely modeled after the real soldier Francis Marion. Additionally, the scenes of the Battles of Camden (1780) and Guilford Courthouse (1781) are excellent portrayals of the traditional close-order formations and tactics used by European armies in the colonial era. The Camden scene also shows how cavalry are effectively used to break a wavering line and run down the fleeing troops.

1776
Released: 1972

The film version of the stage musical, depicting the Founding Fathers and America's first congress.

NAPOLEONIC WARS

Master and Commander
Released: 2003

Set during the Napoleonic Wars, *Master and Commander* explores the war at sea with a twist; it is the British vessel that is at a disadvantage in size and armament and must rely on the skill and wit of its crew to defeat the French. Although the story is fictional, it is excellent in its portrayal of naval warfare in the Napoleonic era, as well as depicting and explaining every aspect of life at sea, from ship conditions and nautical terminology (for example, why speed at sea is measured in knots) to maritime medicine and class distinction.

Voyna i mir (war and peace)
Released: 1967

In 1812, Napoleon led his Grande Armée into Russia; it returned later that year in pieces. Both the United States and the Soviet Union produced epic films based on Leo Tolstoy's novel *Voyna i mir* (1865-

1869; *War and Peace*, 1886), but the 1956 American version, in limiting the film's duration (though it is still more than three hours long), also limits its depiction of key battles such as those at Austerlitz and Borodino. The 1967 Soviet version requires a full day to watch, but it is more comprehensive and detailed in explaining the history behind Napoleon's fatal invasion of Russia and allows the story of the breaking of Napoleon to be told by the country that broke him.

Waterloo
Released: 1970

The last battle of the Napoleonic Wars, Waterloo (1815) pitted the French under Napoleon against the British and Prussians under the duke of Wellington (Arthur Wellesley) and Gebhard Leberecht von Blücher. The film begins with Napoleon's return from exile and ends almost immediately after the battle. The first hour sets the stage for the battle. The remaining half of the film is devoted entirely to the battle itself and presents it on a scale that is worthy of its subject. *Waterloo* is fantastic for showing the battle on a remarkable scale (using twenty thousand extras to flesh out the armies); one particular scene beautifully shows the use of the infantry square as a defense against cavalry.

Texas War of Independence

The Alamo
Released: 2004

In 1836, Antonio López de Santa Anna's Mexican army besieged the tiny garrison of Texans and Tejanos at the Alamo. Although the battle ended in defeat for the defenders, it has become a famous battle in Texas and American history as a symbol of defiance in the face of overwhelming odds. A 1960 version starring John Wayne remained the only film dedicated to the Alamo for more than forty years; however, the film's length, gross inaccuracies and exaggerations, and the fact that the climactic battle scene occupied only a small portion of the film's three-hour duration makes Ron Howard's 2004 release a better choice, though not perfect. Additionally, Howard's version carries the story through to the pivotal Battle of San Jacinto (1836).

American Indian Wars

Geronimo^
Released: 1993

With the Louisiana Purchase in 1803 and victory in the Mexican War in 1848, the United States achieved its dream of stretching from the Atlantic to the Pacific; however, as settlers moved west, the conflict with the Indian tribes—a conflict that began with initial colonization—flared up again. During the Indian Wars, no Indian warrior became more notorious than the Apache warrior Geronimo. Many films and documentaries have been made about Geronimo; famously, the 1962 version starring Chuck Connors as Geronimo had no Native Americans in the cast. This 1993 television release did feature Native Americans and offers the best explanation for Geronimo's motivations and actions.

The Opium Wars

Lin Tze-hsu (the opium war)
Released: 1959

This film depicts the events leading up to, and the initial stages of, the conflict between Great Britain and imperial China known as the First Opium War (1839-1842) and is a valuable tool for three reasons: First, it was the only feature film about the Opium War for nearly fifty years (until the release of *Yapian zhanzheng* in 1997); second, it is a Chinese film and thus tells the story from a non-Western perspective; third and most important, the film was made shortly after the communist takeover of China and is a blatantly anti-West, anticapitalist, and anti-imperialist propaganda film, ending on a victorious note for the Chinese and not mentioning the eventual British victory. The film is useful in teaching about the time it was made, the time it portrays, and the concept that history, particularly military history, can be written differently depending on one's perspective.

CRIMEAN WAR

The Charge of the Light Brigade
Released: 1968

Far superior to the 1936 Hollywood production of the same name (in terms of both historical accuracy and overall presentation), this film portrays the disastrous British cavalry attack known as the Charge of the Light Brigade, which took place at the Battle of Balaclava (1854) during the Crimean War, in which the British charged a fortified Russian artillery position, suffering casualties of nearly 50 percent. The battle, and the characters best associated with it (Lord Cardigan and Lord Raglan in particular), are wonderfully brought to life. The only drawbacks to the film are its abrupt ending, which comes just moments after the attack, and the numerous Monty Python-esque animation scenes that harm the film's authority by making it appear comic.

AMERICAN CIVIL WAR

The Birth of a Nation
Released: 1915

D. W. Griffith's epic film about the reconstructed South and the origins of the Ku Klux Klan is as impressive as it is controversial. The impressiveness of the opening battle scene is rivaled only by the film's gross misrepresentations of the Klan's heroism and the beastliness of the freed slaves. This film is included on the list because of its impact at the time of its release more than its representation of war. *The Birth of a Nation* was a film that affected society at the time of its release by rewriting history. It stands today as an example of the power that film has to influence the course of history as well as our remembrance of it.

The Civil War^
Released: 1990

Perhaps the definitive Civil War documentary, Ken Burns's meticulous compilation of documents, photographs, traditional music, letters, and history brings the full extent of the war—from battles to personal stories to impact on Native Americans—alive using primary sources. Nine parts comprise hours of historical detail on the seemingingly endless course of the war, humanized and brought to life.

Gettysburg
Released: 1993

The Battle of Gettysburg (1863) was the largest battle of the Civil War. *Gettysburg* devotes four hours entirely to the battle, from the initial skirmish just west of Gettysburg to Robert E. Lee's exclamation, "It's all my fault." The attention to detail and historical accuracy makes this an excellent film for anyone interested in the subject, though it is rather lengthy; however, several key events in the battle (the defense of Little Round Top and Pickett's charge, for example) receive special attention and round out the film nicely.

Glory
Released: 1989

After Lincoln issued the Emancipation Proclamation in 1863, the Union Army allowed African Americans to join the Union fight in the American Civil War (1861-1865). The first all-black unit in the army was the Fifty-fourth Massachusetts Regiment under the command of Colonel Robert Gould Shaw. Beginning with a scene of the Battle of Antietam (1862), *Glory* tells the story of the Fifty-fourth from its creation to its brave but disastrous attack on Fort Wagner. Not only is the film's subject significant, but its battle scenes illustrate the ferocity of Civil War combat, especially hand-to-hand fighting. The film also clearly explains that although the North allowed blacks in the military, there was still much racial tension between blacks and Northern whites.

Gone with the Wind
Released: 1939

In terms of its contribution to film history, *Gone with the Wind,* America's first epic in color and the most popular film in American history, is a masterpiece. In regard to historical representation, the film is both a blessing and a curse. Based on Margaret Mitchell's 1936 novel of the same name, *Gone with the Wind* is the perfect film for depicting white soci-

ety in the antebellum South; however, its portrayal of slavery and the causes and conduct of the Civil War is highly skewed. Like *The Birth of a Nation*, *Gone with the Wind* is an excellent example of how film can rewrite the past, and its popularity reveals the extent to which the rewriting of history can be accepted.

Zulu War

Zulu
Released: 1964

After the disastrous defeat at Isandhlwana (1879), the British troops in southern Africa braced for a final knockout blow at the small outpost of Rorke's Drift. Over the course of two days (January 22-23, 1879), the small garrison of around 150 British successfully held off an army of more than four thousand Zulu. In making his argument for a "western way of war," Victor Davis Hansen pointed to the Battle of Rorke's Drift as an example of superior discipline in battle. The entire film, but in particular the last battle scene, does an excellent job of showing how discipline, especially the efforts of sergeants and other noncommissioned officers to keep the soldiers from breaking and fleeing, contributed to the British victory.

Boer War

"Breaker" Morant*
Released: 1980

At the beginning of the twentieth century, the British Empire went to war against Dutch farmers (Boers) in the southern tip of Africa. Because the Boers could not fight toe-to-toe with the British Army, the (second) Boer War (1899-1902) was an unconventional war and required the British to adopt unorthodox tactics in order to defeat the Dutch Kommandos. *"Breaker" Morant* is based on a true story and, though focusing on a court-martial (meaning the majority of the film is courtroom drama), the events leading up to the courtroom are told in flashbacks that display very well the aspects of the war that made it so unconventional.

Russian Revolution and Civil War

Battleship Potemkin
Released: 1925, as *Bronenosets Potyomkin**

In the wake of their disastrous defeat at the hands of the Japanese in the Russo-Japanese War (1904-1905), there was a great deal of social unrest through the Russian Empire. In 1905, sailors aboard the battleship *Potemkin* rebelled at the horrible conditions they were forced to endure. Director Sergei Eisenstein was commissioned by the Soviet government in 1925 to make the film (known in the United States as *Battleship Potemkin*) as a propaganda film. Not only is the film an excellent piece of Soviet propaganda; it also is considered a masterpiece. The scene on the Odessa Steps is considered a landmark scene in the history of film.

Dr. Zhivago
Released: 1965

In the last years of World War I, the Russian people revolted against the czar. Following the collapse of the monarchy and withdrawal from World War I, Russia sank into a brutal civil war pitting the Reds (Bolsheviks) against the Whites (Mensheviks), with the majority of the population caught in the middle. *Doctor Zhivago*, though focusing primarily on a love story rather than political and social events, provides an excellent representation of life in Russia during the Russian Revolution and Civil War. Viewers will draw the most from the film if they brush up on early twentieth century Russian history, but even without that effort, the film has much to offer.

World War I

All Quiet on the Western Front
Released: 1930, 1979 (television)

Based on Erich Maria Remarque's famous war novel *Im Westen nichts Neues* (1929), *All Quiet on the Western Front* is the classic World War I film. Depicting the fighting between the French and the Germans from the German viewpoint, the film not only shows the brutality of trench warfare but also

illustrates the patriotic fervor that led millions of young men on both sides to enlist, as well as the disparity between what the German home front was being told and the actual situation. Of the two versions, each has its advantages. The original version follows the novel more precisely and is a film classic, but color film and improved special effects make the 1979 version better for providing a visual of trench warfare on the western front.

Gallipoli
Released: 1981

In 1915, the British attempted to break the deadlock of trench warfare in Europe and knock the newly entered Turkey out of the war in a single stroke. Soldiers of the Australian and New Zealand Army Corps (ANZAC) assaulted the Turkish positions at Gallipoli in an attempt to wrest control of the Dardanelles away from Turkey. The film is a bit slow at the beginning but does an excellent job of showing the impossibility of trench warfare and the catastrophic Battle of Gallipoli (1915-1916).

Hell's Angels
Released: 1930

Considering the film's age, *Hell's Angels* is a remarkable film. Though incredibly exepensive, director Howard Hughes captured some amazing aerial footage in his filming of Great War dogfights. Most of the scenes involving aircraft are shot with real planes, not models, giving the film enhanced authority and authenticity. The film also illustrates the Zeppelin raids over London, a topic often left out of World War I lectures. The accompanying love story does little to enhance the film, but viewers who stick it out to the end will get to witness a wide-shot aerial battle between the British Royal Flying Corps and the infamous Red Baron's Flying Circus.

Joyeux Noël* (merry Christmas)
Released: 2005

One of the most remarkable events of World War I took place on Christmas Eve, 1914. The British, French, and German troops in one section of the front put down their weapons and fraternized with the enemy. The Christmas Truce, as it was called, witnessed soldiers who only a day before were shooting at each other now sharing family pictures, exchanging gifts, and even kicking around a soccer ball. When news of the unofficial truce reached respective headquarters, it was quickly ended and fighting resumed. The Christmas Truce was never repeated. *Joyeux Noël* was a collaborative effort of German, French, and British filmmakers to bring to the screen an excellent portrayal of one of the most curious and positive events of the war.

La Grande Illusion*
Released: 1937

Jean Renoir's classic antiwar film is set in World War I. Though there are no battle scenes, the film still portrays the brutal reality of war through the terrible toll it extracts from those who fight it, showing that the "grand illusion" is that war is noble and glorious. Like many other films in this list, *La Grande Illusion* has been included because of what it says about the time in which it was produced more than about the time depicted in the film. In 1937, Fascist aggression was pushing Europe toward war. Renoir's film was a reminder of what happened the last time Europe went to war.

Lawrence of Arabia
Released: 1962

Taking place in the Middle East during World War I, this film, though long (four hours), brings to life one of the most dynamic and controversial figures of the time period. *Lawrence of Arabia* is a biography of the wartime career of British officer Thomas E. Lawrence. Not only does it depict the guerrilla-style desert warfare between the British, with their Arab allies, and the Turks, but it also explores Lawrence's attempts at fostering Arab nationalism. The Turkish front was not the decisive theater in the war, but the impact of Lawrence's actions remains today.

Sergeant York
Released: 1941

Alvin York fought with the U.S. Army in the trenches of World War I and distinguished himself by becoming a highly decorated war hero despite being a pacifist and conscientious objector. His most

notable achievement (and the climactic scene of the film) was his single-handed capture of 132 German soldiers. *Sergeant York* is an excellent film, not only because of its subject matter but also because it is a good example of film as propaganda. The film was produced in 1941, just when the United States was faced with the possibility of fighting another war in Europe but before Pearl Harbor tipped the scales in favor of intervention. The film portrays a quiet, simple man, wanting only to live in peace but forced to take up arms in defense of freedom.

Spanish Civil War

Land and Freedom
Released: 1995

This film is a collaborative effort between the United Kingdom and Spain and depicts the civil war that erupted in Spain between 1936 and 1939. The war was one of political ideology (primarily fascist vs. communist) and as such was incredibly brutal. Not only does the film excellently portray the hatred between the two groups; it also brilliantly illustrates the divisions and dissension within the loyalist force (those opposing Generalissimo Francisco Franco), which contributed a great deal to Franco's eventual victory. It also includes the International Brigades, another crucial aspect of the Spanish Civil War, by centering the story on the life of a British communist who goes to Spain to fight.

World War II

Action in the North Atlantic
Released: 1943

Despite its enormous importance to the war effort, the task of the U.S. Merchant Marine in keeping Britain and the Soviet Union supplied with arms and equipment seldom receives much attention in war films. This film, however, is wholly devoted to the perilous journey across the submarine-infested Atlantic Ocean. By 1943, the Battle of the Atlantic was just beginning to turn in favor of the Allies. *Action in the North Atlantic*, though propagandistic, does a good job of showing the various aspects of the war at sea: secrecy, submarines, the convoy system, depth charges, and liberty ships. It is excellent for showing antisubmarine warfare.

Band of Brothers^
Released: 2001

Based on the book by Stephen Ambrose, *Band of Brothers* was an HBO miniseries about the exploits of the 101st Airborne Division in World War II from basic training to shortly after the war ended. The 101st took part in almost every major battle in the European theater, including Normandy, Market Garden, and the Battle of the Bulge. The series was enormously successful and is an excellent source because of its comprehensiveness, historical accuracy, and riveting presentation of the use of paratroopers in modern warfare.

Bataan
Released: 1943

The Japanese attack on Pearl Harbor in 1941 was just a part of a massive offensive in the South Pacific that included an attack on the American-controlled Philippine islands in 1942. The outnumbered and outgunned garrison retreated to the Bataan Peninsula, where they fought a desperate and ultimately unsuccessful struggle. This was one of the first wartime films made by the United States, and although telling a story with an unhappy ending, *Bataan* was made to encourage Americans to continue the fight, even when things looked bleak.

Battle of Britain
Released: 1969

The Battle of Britain (1940) was one of the pivotal battles of World War II. The Royal Air Force and the German Luftwaffe battled for aerial supremacy over the English Channel. *Battle of Britain* is a stunning film that not only provides excellent visuals of World War II-era aerial combat but also explains other important aspects of the battle, such as the role of radar and the international squadrons that supplemented the Royal Air Force. (For an excellent film retelling the Battle of Britain from the viewpoint of one of

these international squadrons, see the Czech production, 2001's *Dark Blue World*). In addition, the film also portrays the devastation of the Blitz, Germany's switch from military to civilian targets.

Battle of the Bulge
Released: 1965

In the winter of 1944, Germany launched a massive attack (Operation Wacht am Rhein) against the Allies in Western Europe, hoping to turn the tide. The attack faltered and instead of moving the entire front it only pushed through in the center, creating a large bulge, hence the name. The end of the film contains a large tank-battle scene that does a good job of showing tank combat. Another important part of the battle, and the film, is the German use of spies to disrupt Allied transportation and communication during the offensive.

The Best Years of Our Lives
Released: 1946

This film begins after the war has already ended, so there are no battle scenes, and almost no "action," yet it is a valuable "war film" because it addresses one of the most important aspects of any war: when Johnny comes marching home. This film tells the story of three different returning soldiers (one Army, one Navy, one Air Force) and shows the trials and difficulties that each has, both physically and mentally, when they try to integrate back into society. Demobilization is an important part of any war, and this is one of the few films devoted entirely to it.

Bridge on the River Kwai
Released: 1957

Prisoner-of-war (POW) films are an essential part of World War II. For the Pacific theater, *Bridge on the River Kwai* and *The Great Raid* (2005) focus on POW camps, while Steven Spielberg's *Empire of the Sun* (1987) looks at civilian internment camps. Of these, *Bridge on the River Kwai* is the best choice, not only because of its good depiction of the brutality of Japanese POW camps but also because of its excellent portrayal of how concepts of right and wrong can be severely skewed in wartime (as exemplified by Alec Guiness's character, who initially resists the Japanese attempts to put POWs to work and unwittingly ends up fully cooperating in the end).

A Bridge Too Far
Released: 1977

After the successful D-day landings, Field Marshall Bernard Law Montgomery concocted Operation Market Garden, a plan that, if successful, would end the war by Christmas of 1944. The plan was for American and British paratroopers to capture strategic bridges across the major rivers in the Netherlands, paving the way for an invasion of Germany. *A Bridge Too Far*, based on the book by journalist Cornelius Ryan, is an excellent retelling of the event and includes both the Allied and German perspective. It is one of the standards of World War II films.

The Burmese Harp*
Released: 1956, as *Biruma no tategoto*

Based on Michio Takeyama's novel, *The Burmese Harp* begins in the last days of fighting between the British and Japanese in World War II. The film is important, not because of the time period it depicts but because of the time period in which it was produced. The film was made shortly after the American occupation ended and portrays the war in Asia from the Japanese perspective. It makes a very clear distinction between the "warmongers" in the army and the majority of Japanese soldiers, who did not want to fight. It is a film that works hard to reverse the warrior image that the Japanese constructed during the war.

Catch-22
Released: 1970

Taking place on the Italian Peninsula in the later years of World War II, *Catch-22* is an adaptation of Joseph Heller's novel about the American bombing efforts from Italy after the fall of Benito Mussolini. As a sharp criticism of war (Vietnam in particular, with which the film was contemporaneous) and the people who run it, *Catch-22* is unconventional and comedic in its portrayal of war and the American military. The absurdity of the characters and events in the film are meant to express the absurdity of war.

The very term "catch-22" entered the English vocabulary as a result of Heller's unorthodox and comedic approach to war criticism.

Das Boot* (the boat)
Released: 1981

Whereas *Action in the North Atlantic* tells the story of the war in the Atlantic from the perspective of the U.S. Merchant Marine, *Das Boot* shows the war from the view of the German U-boats that hunted Allied ships from beneath the waves. Wolfgang Peterson's intention was to make an antiwar film that not only showed the terror of war at sea but also drew clear distinctions between Nazis and Germans. It is an excellent film for showing life and combat onboard a submarine. The more recent *U-571* (2000) is another good film for depicting World War II submarine warfare, but its historical inaccuracies make *Das Boot* a better choice.

Defiance
Released: 2008

An important, though often forgotten, aspect of World War II on the eastern front is the role of the partisans. Many bands of these guerrilla fighters, composed of Jews, communists, Eastern Europeans, and other groups deemed "undesirable" or "subhuman" by the Nazis, fought against the Germans for the majority of the war. This is an excellent film for depicting the lives and various difficulties of the partisans in World War II.

The Desert Fox
Released: 1951

See "Cold War" section below.

The Great Dictator
Released: 1940

Charles Chaplin's personally funded critique of Nazi Germany appeared on the silver screen only one year after the war in Europe officially began but before the United States' entry. In typical Chaplin style, the film uses slapstick comedy to attack Adolf Hitler, Benito Mussolini, and fascism in general. Although there are no battle scenes, the film is an excellent resource for an illustration of Nazi Germany's foreign and domestic policies through Chaplin's unique comedic style.

The Great Escape
Released: 1963

Films about German prisoner-of-war (POW) camps present an interesting problem. Unlike those depicting Japanese camps, the spectrum for films about German camps (outside Holocaust films) ranges from the adventurous, such as *Von Ryan's Express* (1965), to the wildly comedic 1960's television program *Hogan's Heroes*. However, the best choice is *The Great Escape*. Based on real events, the film depicts the attempt of British and American POWs to stage a massive escape. Though the story does not exactly have a happy ending (few of the men actually succeed), *The Great Escape* is an excellent film for showing life and conditions in a German POW camp.

The Grey Zone
Released: 2001

Though not a war film per se, *The Grey Zone* depicts the Holocaust as the consequence of combining nationalism, modernity, industrialism, and warfare. No list of war films would be complete without at least one film that addresses the Holocaust, and this one—not Steven Spielberg's *Schindler's List* (1993)—is the best choice. It is based on the Jewish inmates at Auschwitz who helped run the gas chambers and crematoria in exchange for a few months' stay of execution. It is the best choice because it is as dramatic and graphic as *Schindler's List*, but it explores more of the complex issues related to the Holocaust, such as the fine line between collaboration and survival and other moral questions posed by the Holocaust.

Hadashi no Gen* (barefoot Gen)
Released: 1983

On August 6, 1945, an American B-29, *Enola Gay*, dropped the world's first atomic bomb. The Hollywood production *Fat Man and Little Boy* (1989) retells the story of the bomb's construction, and many other American films allude to the bomb, but to see a film about the impact of the bomb we must turn to Japanese anime. As the only cartoon on

the list, *Hadashi no Gen* lets viewers experience the bomb, and all the devastation that went along with it, from the eyes of those who experienced it. Written by a survivor of the bombing of Hiroshima, the film not only depicts the explosion itself (in graphic detail), but also the unforeseen consequences, such as radiation poisoning, nuclear fallout, and the social chaos that resulted from the weapon that ushered in the nuclear age.

Kanal*
Released: 1957

In 1944, the German army was in retreat. As the advancing Red Army entered Poland, partisans in the city staged a massive uprising, hoping for help from the approaching Soviets. Unfortunately, the Soviets halted outside Warsaw, allowing the Germans time to crush the uprising. *Kanal*, a Polish production, is the first film about the uprising (not to be confused with the Warsaw Ghetto uprising in 1943). The film depicts the hopelessness of the struggle as well as the determination of the Poles to fight on, even when defeat is inevitable.

Letters from Iwo Jima *and* **Flags of Our Fathers**
Released: Both 2006

Iwo Jima was the bloodiest battle in United States Marine Corps' history, waged on one of the last islands to be taken before the Japanese mainland could be invaded. Both the attacking Marines and the Japanese defenders fought tenaciously for control of it. In representing this battle on film, director Clint Eastwood made not one but two films, each telling the story of the fight for Iwo Jima, one film for each side. The two versions ought to be viewed as two halves of the same film. The battle scenes are epic and detailed, showing the brutality that characterized the war in the Pacific, but the films' greatest contribution is that they show both sides of the same story and demonstrate that history depends on viewpoint.

The Longest Day
Released: 1962

As the film adaptation of Cornelius Ryan's book, *The Longest Day* rests alongside 1969's *Battle of Britain* and 1977's *A Bridge Too Far* as the classics of epic World War II films. The film tells the story of Operation Overlord (the Normandy invasions, or D day), the largest amphibious assault in history, from both the Axis and the Allied sides, leaving out very little detail. The film provides an excellent background to the planning and execution of all facets of the operation, including paratroopers, deception tactics, the role of the weather, and the confusion and weakness of the Axis response.

Memphis Belle
Released: 1990

Beginning in 1942, the United States Army Air Force took part in the air war against Germany by conducting daylight bombing raids using the B-17 "Flying Fortress." *Memphis Belle*, like many war films, is double-edged. Nearly the entire film is devoted to the actual mission, giving viewers a chance to experience every aspect of a daylight mission from takeoff to touchdown. The disadvantage of the film is that while it claims to be based on a true story, the story has been so altered as to leave only the name of the plane as historically accurate. This is an excellent film for showing an example of the air war, but not for telling the story of the *Memphis Belle*.

Midway
Released: 1976

In June of 1942, the American and Japanese navies fought a battle in which neither fleet actually saw the other. The entire engagement was a dual between aircraft launched from carriers just off the coast of the island of Midway. The battle resulted in a resounding victory for the United States and critically crippled the Japanese ability to pursue the war in the South Pacific. *Midway* is entirely devoted to this pivotal battle and reaffirmed what Pearl Harbor demonstrated: that the aircraft carrier was now the king of the seas. Additionally, the film successfully weaves stock footage into the battle scenes, making them more authoritative.

Patton
Released: 1970

General George S. Patton was one of the most colorful and controversial figures of World War II. Hav-

ing fought the Axis powers from Africa all the way to Germany, Patton earned a reputation as one of the best generals of the war. Although the film takes a few liberties here and there, *Patton* brings to life one of the United States' most famous military figures through the brilliant performance of George C. Scott. The film portrays Patton's brilliance in combat, his eccentricities off the battlefield, and his personality and ego clashes with Field Marshall Bernard Law Montgomery.

Roma, città aperta (Rome, open city) *and* **L'Armée des ombres (army of shadows)**
Released: 1945 and 1969 respectively

After the fall of France in 1940, those men and women who continued to resist both the Germans and the Vichy government formed the Maquis, the French Resistance. As an important part of World War II, no film list would be complete without a film about the Resistance. This film, which covers the middle war years when the Resistance was small and particularly vulnerable, provides an excellent illustration of the cloak-and-dagger world in which the Maquis had to operate. Like *L'Armée des ombres* (1969), *Open City* is a film about the clandestine resistance efforts in occupied Italy. Though not as famous as the Maquis, the Italian Resistance faced many of the same trials and suffered many of the same pains as the French Resistance.

Saving Private Ryan
Released: 1998

Operation Overlord was the largest amphibious assault in history and involved American, Canadian, and British troops storming the beaches of northern France, guarded by Germans and Ostbattalionen (conscripts from Eastern Europe). To gain a better understanding of the history surrounding the Allied invasion of Normandy, *The Longest Day* is the best choice, but *Saving Private Ryan*, through improved special effects, attention to detail, and stripping away of the "sanitized" depictions of war, portrays the battle so vividly and with such intensity that it not only revolutionized battle scenes but also traumatized many war veterans who saw the film.

Since You Went Away
Released: 1944

Along with *The Best Years of Our Lives*, *Since You Went Away* is a film that reminds its audience that war is not just about "over there." In many ways this film is simply producer David O. Selznik's *Gone with the Wind* retold in a World War II setting. The entire film takes place on the home front and shows what civilians, particularly the families of soldiers, must go through in wartime. Although romanticized, the film does address issues such as rationing, women in the war industry, recruitment, scrap metal drives, and the pain of receiving a telegram from the War Department.

Sink the Bismark!
Released: 1960

World War II marked the end of the battleship's dominance of the seas with the emergence of the aircraft carrier; however, the naval war in the Atlantic had few carriers. The German battleship *Bismark* threatened to devastate the Allied shipping that was keeping Britain in the war; thus, it became important for the British navy to "sink the Bismark." *Sink the Bismark!* is an excellent film for showing pre-carrier warfare and illustrating how navies fought before the advent of the aircraft.

So Proudly We Hail! *and* **Cry Havoc**
Released: 1943 and 1947 respectively

The war brought numerous opportunities for women to challenge traditional stereotypes given them by society, both by working in the war industry at home and by serving in the armed forces abroad as nurses. Both films tell the story of army nurses in the Philippines. As the release dates reveal, not only did these films recognize women in the war effort; they also served to encourage more women to do the same. There are not many other films wholly devoted to women's wartime service; *Cry Havoc* and *So Proudly We Hail!* are as essential to any collection of war movies as women's efforts were to the war itself.

Stalingrad*
Released: 1993

The Battle of Stalingrad is arguably the decisive battlefield of World War II. It lasted through the winter of 1942-1943 and saw some of the most intense urban combat of the war as the Germans fought the Soviets for control of the gateway to the Caucasus and the city named for Stalin. By February, 1943, the German army at Stalingrad and thus the war in the east were broken. The German production *Stalingrad* portrays the battle from the perspective of the Germans who fought it and depicts the bloody fighting and horrible conditions under which they fought.

Talvisota* (the winter war)
Released: 1989

Shortly after the Germans invaded Poland in 1939, the Soviet Union used the nonaggression pact with Germany to launch an invasion of Finland. For the next two years the Finns fought a desperate and little-known war against the Red Army. The Soviets had such superiority in men and matériel that their victory seemed a foregone conclusion, but to the shock and dismay of the Soviets, the Finnish soldiers succeeded in defending their homeland and won the Winter War. *Talvisota*, a Finnish production, is the first and only major film to depict the war and does so splendidly.

The Thin Red Line
Released: 1998

After the Battles of Midway and Coral Sea destroyed Japan's ability to expand its empire, the United States had the task of rolling back Japanese gains in the Pacific. The "Island-Hopping" campaign began with the attack on Guadalcanal in the Solomon Islands. Based on James Joyce's novel, *The Thin Red Line* depicts the fight for Guadalcanal and not only is an excellent film for portraying the brutality of the war in the Pacific (as well as atrocities committed by both sides) but also addresses the mentality of the men fighting, showing that soldiers are not simply mindless machines.

Thirty Seconds over Tokyo
Released: 1944

Following the attack on Pearl Harbor, the United States wanted to take some sort of immediate, punitive action against the Japanese. The result was the Doolittle Raid, a bombing raid over Tokyo comprising 16 B-25 "Mitchell" bombers, which would attack the city and then fly to safety in unoccupied China. Although ineffective strategically, the Doolittle Raid was a big morale boost for the United States following the shock of December 7. This film adequately depicts the raid's planning, training, and execution.

To Hell and Back
Released: 1955

Audie Murphey was America's most decorated soldier in World War II and in many respects is to World War II what Alvin York was to World War I. Murphy rose from private to lieutenant and earned almost every medal the United States had to offer. The film, based on his war autobiography of the same name, follows Murphy's life from his adolescence through the end of the war. The battle scenes are good, but not spectacular. This movie is included, like *Patton* and *Sergeant York*, because of the importance of the individual to American military history.

Tora! Tora! Tora!
Released: 1970

On December 7, 1941, carrier-based planes of the Japanese Navy laid waste to the American fleet at Pearl Harbor. Although the more recent film *Pearl Harbor* (2001) makes use of computer graphics and better special effects to make a much more action-packed battle scene, *Tora! Tora! Tora!* is by far the better film for explaining the reasoning, planning, and execution of the attack (and the battle scene is well done). As a collaborative effort between the United States and Japan, the film tells the story from both sides objectively and remains the best film made about the "day of infamy."

The Tuskegee Airmen^
Released: 1995

Along with women, World War II provided the black community with opportunities to challenge so-

cial stereotypes. The Tuskegee Airmen were the first black fighter pilots in the U.S. Army Air Force; they saw combat in both North Africa and Italy. Although the only nondocumentary film on the subject, *The Tuskegee Airmen* is an excellent film for showing the trials and difficulties associated with race relations during the war in general, as well as telling the story of America's first black fighter squadron.

Der Untergang* (the downfall)
Released: 2004

In the last days of World War II, Adolf Hitler retreated into his Berlin bunker to lead the futile last-ditch defense of the city. This film, a German production based on accounts by those who lived in the bunker with Hitler during those last days, is an excellent representation of the final days of the Third Reich as well as an illustration of the devastation of urban combat. Because most of the army had been killed or captured, Berlin's defenses had to be heavily supplemented by the Volkssturm, the militias made up of teenage boys and old men, and the film nicely illustrates the use of those forces.

Valkyrie
Released: 2008

In July of 1944, a small group of Adolf Hitler's top officers plotted to kill him. Though this event forms a large part of the film *The Desert Fox*, *Valkyrie* is devoted entirely to the planning and failed execution of the attempt. The film does a good job of establishing that the officers involved were motivated, not for any moral concerns, but because they thought Hitler was leading the country to ruin militarily. The film also offers a nice contrast to *The Desert Fox*, because the two illustrate a long-standing debate over the role of Erwin Rommel in the assassination attempt. *Desert Fox* places him at the center, while *Valkyrie* makes no mention of him at all.

A Walk in the Sun
Released: 1945

After defeating the Germans in Africa, the Allies moved on to Sicily and then the Italian Peninsula, where the fighting bogged down in conditions similar to the trenches of World War I (though in Italy the majority of the Axis forces were German). War has been described as "long periods of boredom punctuated by moments of sheer terror," and *A Walk in the Sun* portrays that beautifully. Opening with a brief battle scene when American forces land on the beaches in Italy, the rest of the film is simply "a walk in the sun" until the final battle scene: an assault on a farmhouse occupied by the Germans.

Windtalkers
Released: 2002

As the United States continued to fight the Japanese in the Pacific, the American military had problems with maintaining security. Japanese intelligence continually broke American radio codes, severely hampering the American effort. To solve the problem, the United States began using Navajo Indians as radio operators to prevent the Japanese from cracking the code. The code talkers played an important part, not only in winning the war, but also in the advancement of race relations back on the home front, and although *Windtalkers* is not the best film about the war in the Pacific theater, the subject of its plot makes it an important film.

Cold War

The Day After^
Released: 1983

One of the most controversial films of its day, aired on television, *The Day After* depicts the grim aftereffects of a nuclear bombing in Lawrence, Kansas, at the height of the antinuclear movement that characterized the Cold War period.

The Desert Fox
Released: 1951

Erwin Rommel led the Afrika Korps against the British and Americans in North Africa. Although ultimately failing in Africa, Rommel has became a legend both in German and in British and American history, partly because of his skill as a general, partly because of his supposed involvement in the July plot to assassinate Adolf Hitler. *The Desert Fox* is in-

cluded because of the time period it represents, rather than the time it depicts. Produced in 1951, *The Desert Fox* was an early Cold War film. The Soviet Union replaced Nazi Germany as the arch-enemy of the United States, and divided Germany emerged as the likely battleground for a struggle between the United States and the Soviet Union. This film is an excellent example of the backpedaling that had to be done to turn former World War II enemies into Cold War allies.

Dr. Strangelove
Released: 1964

Although completely fictitious, the context and themes of *Dr. Strangelove* are completely accurate. Just two years before the film's release, the United States and the Soviet Union came within inches of nuclear war during the Cuban Missile Crisis. This film explores the tension and fears of nuclear holocaust while poking fun at the generals and politicians who ultimately made the decisions that would lead to or avert a nuclear war. In playing on the fear of nuclear attack and the impotency of all but a few to do anything about it, director Stanley Kubrick appropriately subtitled his film *Or, How I Learned to Stop Worrying and Love the Bomb*.

Fail Safe
Released: 1964

Released almost simultaneously with the classic film *Dr. Strangelove* (whose director, Stanley Kubrick, is said to have complained to studio executives that the nearly identical story line plagiarized his film—and won first release), *Fail Safe* is the dead-serious counterpart to Kubrick's eerie send-up, showing U.S. bombers headed toward Russia after a faulty order to drop the nuclear bomb cannot be reversed. The two can be regarded as complementary treatments of a similar scenario, both released only two years after the Cuban Missile Crisis—but the tone of *Fail Safe* is unrelentingly grim and chilling.

The Hunt for Red October
Released: 1990

The story line of *The Hunt for Red October* follows a high-ranking Soviet officer's attempts to defect to the United States and the United States' attempt to prevent the defection from leading to open war. Like the later production *Crimson Tide* (1995), *The Hunt for Red October* has a wholly fictitious story line, but both films are excellent for showing life on a submarine and portraying modern naval warfare. The much later *K-19: The Widowmaker* (2002) is also a good submarine film and gives the Soviet perspective in a more historically based setting.

The Missiles of October
Released: 1974

This 150-minute docudrama details the events leading up to and during the Cuban Missile Crisis of October, 1962. It is based on Robert F. Kennedy's book *Thirteen Days* (1969).

Thirteen Days
Released: 2000

For two weeks in October of 1962, the United States and the Soviet Union came as close as they ever would come to starting World War III over the Soviet positioning of missiles in Cuba. *Thirteen Days* tells the story of the Cuban Missile Crisis from the initial discovery of the missile sites to the peaceful resolution and does an excellent job of conveying the tension of the crisis and creating an engaging film without making too many sacrifices to historical accuracy. Although bearing the same title as Robert F. Kennedy's book, this film is based on the book *The Kennedy Tapes* (1997), by Ernest May and Philip Zelikow.

KOREAN WAR

The Bridges at Toko-Ri
Released: 1954

Although Germany began experimenting with jet aircraft during World War II, jets did not come into their own until the Korean War five years later. *The Bridges at Toko-Ri* was the first film in which American moviegoers would have been able to see jets on the silver screen, introducing them to modern aerial

combat as well as a detailed depiction of launching and landing jets from aircraft carriers. However, being first does not also mean being the best: *Top Gun* (1986) is much better at depicting aerial combat using modern jet aircraft.

M*A*S*H
Released: 1970

Set during the Korean War, *M*A*S*H* is a unique war film. First, it takes place in a field hospital and portrays the battles waged in the operating room after the battles on the frontline end. Battlefield medicine is an essential part of any war, but *M*A*S*H* is one of the only films dedicated to it. Second, as a comedy, *M*A*S*H* belongs to that very small group of films that critique war through humor and satire; third, the film introduces the helicopter, a new technology at the time; finally, it is a product and reflection of its time. Written, filmed, and released while the United States was embroiled in the Vietnam War, the movie, later to become a long-running television series, can be seen as much as a commentary on Vietnam as a show set in the Korean conflict.

Retreat, Hell! *and* **Pork Chop Hill**
Released: 1952 and 1959 respectively

The Korean War matched U.N. forces (predominantly South Korean and American) against communist North Korea and its Chinese allies. In choosing a film about the experience of American soldiers in combat, the choice is a toss-up between *Pork Chop Hill* and *Retreat, Hell!* Historically speaking, *Retreat, Hell!* is a better film for showing the course of the war from General Douglas MacArthur's landing at Inchon to the Battle at the Chosen Reservoir, but in regard to battle scenes, *Pork Chop Hill* is the better choice. The best option would be to watch these two together, thus combining the strategic overview with combat close-up.

Taegukgi hwinallimyeo*
Released: 2004

The Korean War pitted the North Koreans and their Chinese allies against United Nations forces consisting of South Koreans, Americans, British, Canadians, and a half dozen other countries. What makes this film so essential is that it portrays the war as a *Korean* war. Most other major films about the Korean War portray the American effort against the Chinese. This film however, portrays the film as a civil war and does an excellent job, not only in utilizing the filming techniques that made the battle scenes of *Saving Private Ryan* so surreal but also in making an antiwar statement by emphasizing the brutality of war and showing both North and South Koreans committing atrocities.

Vietnam War

Apocalypse Now
Released: 1979

Francis Ford Coppola's rendition of Joseph Conrad's 1902 novel *Heart of Darkness* is a scathing criticism of the Vietnam War. As the story develops, the film blurs the line between friend and foe and leaves the viewer questioning the war's purpose, conduct, and goals. Not only is the film's message blatant, but the images and script have had a tremendous impact on American popular culture. Even today, people who have never seen the film quote lines from it.

Born on the Fourth of July
Released: 1989

This film is Oliver Stone's second Vietnam-based project and, like its predecessor *Platoon* (1986), is highly critical of the Vietnam War, showing the terrible price that the war extracted from those who fought it. Based on the life of Vietnam veteran Ron Kovic, *Born on the Fourth of July* shows not only the chaos of Vietnam (such as friendly fire and the killing of civilians) but also the chaos the war unleashed at home as the American people turned against the conflict.

The Deer Hunter
Released: 1978

As one of the first films to challenge the Vietnam War portrayed in *The Green Berets* (1968), *The Deer Hunter* excellently examines the physical and mental impact that the war had on those who fought it. There

is only one short combat scene, yet the movie is intensely gory in its depiction of the actions of both American and Vietnamese soldiers, suggesting that in Vietnam there were no "good guys" and no "bad guys," just a mass of senseless violence characterized by numerous scenes in which people play Russian roulette for money.

Dien Bien Phu*
Released: 1992

The siege of the French fortress at Dien Bien Phu began in March, 1954, and ended two months later. The Viet Minh, with help from communist China, besieged the fortress and slowly strangled it into submission. The battle was significant because it signaled the end of French control in Vietnam, and the beginning of the path toward eventual American involvement. *Dien Bien Phu*, a French production, is one of the only films available about the battle.

Flight of the Intruder
Released: 1991

Nearly every set in movies about the Vietnam War represents the ground and recounts the war from the standpoint of the men who waded through the jungles and rice paddies. However, airpower was a big part of the American effort in Vietnam, and thus *Flight of the Intruder* makes the list to provide a film about the war from the viewpoint of the pilots who flew the air raids always seen in the ground films.

Full Metal Jacket
Released: 1987

Like *Platoon* (1986), *Apocalypse Now* (1979), and *The Deer Hunter* (1978), Stanley Kubrik's *Full Metal Jacket* is a classic antiwar, anti-Vietnam film. The film is best known for its first thirty minutes, which are dedicated to depicting life in a marine boot camp, and the breaking down of the individual in order to rebuild him as a killer. The film also contains a scene depicting the Tet Offensive, the massive Viet Cong attack of South Vietnam in January of 1968.

The Green Berets
Released: 1968

The Green Berets is John Wayne's pro-Vietnam, pro-American propaganda film, released (coincidentally, on July 4) shortly after the Tet Offensive in an attempt to gain support for the war. The film depicts the war as a good war, the Americans as fighting a just cause, and the war itself as harsh but not overly brutal or bloody; there are also clear distinctions between "good guy" and "bad guy." The war portrayed in *The Green Berets* is very different from, and is seriously challenged by, almost every Vietnam film that follows.

Platoon
Released: 1986

Oliver Stone's first anti-Vietnam film has become, arguably, *the* anti-Vietnam film. The film depicts the actions of one platoon in Vietnam and illustrates the myriad conflicts and problems within the army itself, to say nothing of difficulties fighting the enemy—problems such as insubordination, drug addiction, fragging, and atrocities against the Vietnamese, to name a few. Although no specific historical battle is portrayed, the film gives an excellent depiction of the guerrilla tactics that characterized the war, as well as a few scenes showing the elaborate tunnel system that the Viet Cong used with great success.

We Were Soldiers
Released: 2002

Near the close of 1965, the United States had its first, and one of the only, pitched battles against North Vietnamese regulars in the Ia Drang Valley. *We Were Soldiers* is the story of the Ia Drang battle and not only provides an excellent portrayal of the conflict but also highlights the introduction and role of the helicopter, a technology that has come to characterize the Vietnam War. This film is also important because it is a reaction against anti-Vietnam films and an attempt to return to the war as portrayed in *The Green Berets*.

Cambodian Civil War

The Killing Fields
Released: 1984

As the war in Vietnam intensified, it spilled over into neighboring Cambodia. The communist Khmer Rouge took over the Cambodian government and began a systematic cleansing of political enemies, intellectuals, and anyone who posed a threat to the regime. A full one-third of the population of Cambodia was killed in the Khmer Rouge's "killing fields." *The Killing Fields* is the only feature film to explore Pol Pot's murderous regime; thus it is an essential component of any list of films dealing with war.

War of Algerian Independence

The Battle of Algiers* (La battaglia di Algeri)
Released: 1966

The end of colonialism was characterized by war. This film depicts the Battle of Algiers, France's victory in defeating the National Liberation Front and maintaining control of Algeria in the short-term, but ends noting that Algeria eventually gained its independence. The film is an excellent depiction of the terror tactics and atrocities committed on both sides, and it shows just how violent anticolonial struggles could be. The film takes a few historical liberties but overall is historically accurate.

Arab-Israeli Conflict

Kippur*
Released: 2000

In October of 1973, Egypt and Syria jointly attacked Israel on Yom Kippur. *Kippur*, an Israeli-French production, is based on the actual experiences of a helicopter rescue team as they evacuate the wounded from the battlefield. There are very few films about the Arab-Israeli conflict readily available, and what makes *Kippur* stand out is its ability to turn the viewer into a participant. The film also contains many long, unbroken scenes that help make the experience real, chaotic, and sometimes necessarily boring, rather than jumping from action to action as many war films do.

Falklands War

An Ungentlemanly Act^ *and* **Iluminados por el fuego* (blessed by fire)**
Released: 1992 and 2005 respectively

The fight for the Falkland Islands (or the Malvinas, to the Argentineans) began in April of 1982. The war lasted only a few months and ended in a British victory. Each of these films is biased in favor of the country that produced it, but together they paint a good picture of the entire conflict as well as demonstrate that history changes depending on who is telling it. *An Ungentlemanly Act* focuses primarily on the initial Argentinean invasion. Only the last five minutes of the film address Britain's counterattack and eventual reconquest of the island. *Iluminados por el fuego* begins in the midst of the war, after the British returned in force, and carries through to the postwar era.

First Gulf War

Jarhead
Released: 2005

Of the handful of films set in the First Gulf War—including *Courage Under Fire* (1996) and *Three Kings* (1999)—*Jarhead* is the best choice. It follows a unit of Marine snipers from boot camp to the end of the war. There is not much combat, and no epic battle scene caps the film, but that is what makes *Jarhead* valuable. Battles in the First Gulf War were few and far between, which was good for civilians at home but was torture for Marines trained to fight and kill; simply waiting for the unknown was worse than confrontation with a physical enemy. The film also explores the soldier's anguish over life back home. *Jarhead* is a new type of war film that focuses primarily on the war within the soldier rather than the soldier within the war.

YUGOSLAVIAN CIVIL WAR

No Man's Land*
Released: 2001

With the death of Tito in 1980, Yugoslavia descended into chaos as nationalist sentiment, historical precedent, and religious differences led to brutal conflict between Croats, Serbs, Bosnian Muslims, and other ethnic groups. *No Man's Land* not only presents an excellent depiction of the violence of the war and the intense hatred between the various sides but also exposes the impotence of the United Nations to maintain peace and reach a peaceful compromise. The film, telling the story of only a handful of characters fighting over a single trench, provides an allegory for the war.

SOMALI CIVIL WAR

Black Hawk Down
Released: 2001

In 1993, the United States military staged a small raid in the city of Mogadishu, hoping to capture important figures in the government of Warlord Mohamed Farrah Aidid. The raid went smoothly until the local militia shot down a Black Hawk helicopter that was providing support for the raid. The rescue mission turned into a two-day battle between a small group of Army Rangers and Delta Force soldiers against the entire city militia in what is now known as the Battle of Mogadishu. The film is a graphic and detailed example of late twentieth century warfare.

RWANDAN CIVIL WAR

Hotel Rwanda
Released: 2004

During the decolonization of Africa, many parts of the continent erupted in violence. One of the most shocking examples occurred in Rwanda, where in 1994 Rwandan Hutus killed one million of their Tutsi compatriots in one hundred days. As demonstrated by *The Grey Zone* (2001) and *The Killing Fields* (1984), modern war has made genocide possible. What makes the genocide in Rwanda different (and prompts its inclusion on this list) is that the United Nations, though pledged to prevent genocide, failed to take adequate measures to stop it.

Chris Thomas

War Literature

The following works are important in the study of military history. They are selected for their value in representing the conflict and/or the period in question, and they are arranged in roughly chronological subsections, within which they are arranged alphabetically by title.

Ancient World

Anabasis
Author: Xenophon
First published: 386-377 B.C.E., as *Kyrou anabasis*

Anabasis chronicles the determined survival of an army of ten thousand Greek mercenaries stranded in northern Mesopotamia by the death of the claimant to the Persian throne who hired them. Although the author's account of the mercenaries' endurance against enormous military odds and great geographical obstacles is clearly colored by self-interest, the narrative is so stirring that it is said to have provided the literary inspiration for Philip of Macedon and Alexander the Great's shared conviction that they could conquer the Persian Empire with a relatively small but highly disciplined Greek army.

The Art of War
Author: Sunzi (Sun Tzu)
First published: c. 510 B.C.E., as *Bingfa*

This treatise on waging war consists of thirty-six stratagems covering everything from geopolitical strategy to battlefield tactics to the practice of espionage. In all of these areas, Sunzi advises caution over bellicosity. He argues for short wars with broad support among the population and warns against the corrosive effects of protracted conflicts. He argues for the clever manipulation of all possible advantages in everything from topography to weaponry, for the mitigation of the limitations of one's own forces, and for the concentration of force where the enemy is most vulnerable. That many of these ideas have become truisms is a testament to Sunzi's lasting influence.

The Gallic Wars
Author: Julius Caesar
First published: 52-51 B.C.E., as *Comentarii de bello Gallico* in *Commentaries*

This classic work of military commentary and Latin prose consists of seven books, with each book covering one year of Caesar's seven-year campaign to subdue Gaul. Written in the third person, the narrative focuses not only on the major battles but also on the logistical preparation, intelligence gathering, political maneuvering, and tactical ingenuity that enabled Caesar's always greatly outnumbered forces to defeat the Celtic tribes. For all of their ferocity, however, the Gallic tribes had been decimated by long, ongoing conflicts with Germanic tribes, and they remained unable to overcome their tribal divisions for any extended period.

The History
Author: Herodotus
First published: c. 424 B.C.E., as *Historiai Herodotou*

Known as the "Father of History," Herodotus originally published his *History* in nine volumes. His primary subject was the Greco-Persian Wars of the fifth century B.C.E., which ensured the continuing independence of the Greek states and their formative role in the development of Western culture. He also, however, traveled widely throughout the Mediterranean world, and his histories include not only what he learned, first- and secondhand, about the lands that he visited but also what he learned about lands that lay beyond those he visited. Thus, he provides many of the earliest European references to regions such as sub-Saharan Africa and India.

History of the Peloponnesian War
Author: Thucydides
First published: 431-404 B.C.E., as *Historia tou Peloponnesiacou polemou*

Establishing many of the fundamental elements of modern historiography, Thucydides attempted to provide an objective history of the Peloponnesian War, despite the fact that he had been a combatant and could be expected to be biased toward the side on which he fought. The war was fought between the Delian League, led by Athens, and the Peloponnesian League, led by Sparta. The war ended Athens's preeminence and opened the way for the Macedonian conquest of Greece less than a half century later. Covering the first twenty-one years of the twenty-seven-year conflict, *History of the Peloponnesian War* has been divided into eight books. It is assumed that Thucydides was still working on the project when he died.

Iliad
Author: Homer
First published: c. 750 B.C.E.

The oldest surviving work in the Western literary canon, this epic poem describes the extended Greek siege of Troy, a major port in Asia Minor. Focusing on the martial achievements of the heroes on both sides and the dramatic deaths of many of the noteworthy combatants, the poem presents the great warrior as a sort of demigod. The greatest of all these warriors is the Greek Achilles, against whom no Trojan hero, not even Hector, can stand. The war and the poem conclude with the Greeks' apparent withdrawal and their "gift" to the besieged city of the so-called Trojan horse. Actually filled with Greek warriors who, under cover of darkness, open the city's gates to the returning mass of the Greek army, the Trojan horse has become a symbol for any audacious deception.

The Mahabharata
Author: Vyasa
First published: c. 400 B.C.E.-200 C.E., *Mahābhārata*

One of the two great epics in Sanskrit that define much of the cultural and religious traditions of Hinduism, the *Mahabharata* includes more than 100,000 verse lines and 1.8 million words. On a basic narrative level, this epic poem is a chronicle of the struggle for royal succession in the Kuru kingdom of Hastinapura, a struggle that reached its great climax in the Kurukshetra War. The contending claimants to the throne are the Kaurava and the Pandava branches of the royal bloodline. Despite incredible demonstrations of valor by the great warriors on both sides during the war, the Pandava are ultimately victorious. Commentators have often drawn parallels between this Sanskrit epic and the *Iliad*.

Masters of Rome
Author: Colleen McCullough
First published: 1990-2007

Best known for *The Thorn Birds* (1977), the melodramatic family saga about the development of Australia, McCullough followed its tremendous commercial success, including its adaptation as an extremely popular television miniseries, with a complete change of direction. In the seven novels of her painstakingly researched series Masters of Rome, McCullough chronicles the fall of the Roman Republic and its transformation into an imperial state. The seven novels include *The First Man in Rome* (1990), *The Grass Crown* (1991), *Fortune's Favorites* (1993), *Caesar's Women* (1996), *Caesar: Let the Dice Fly* (1997), *The October Horse* (2002), and *Antony and Cleopatra* (2007).

Memoirs of Hadrian
Author: Marguerite Yourcenar
First published: 1951, as *Mémoires d'Hadrien*

Working from the fact that the Roman emperor Hadrian wrote an autobiography that was lost to history, Yourcenar provides a fictional version of that autobiography in this, her most acclaimed novel. Epistolary in form, the novel is framed as a letter from Hadrian to his presumptive successor, Marcus Aurelius. After years of immersing herself in Roman history and culture, Yourcenar was able to create and sustain a voice for Hadrian that won over classicists as well as more general readers, re-creating the milieu that he shaped at a level far beyond the usual "costume novel."

Spartacus
Author: Howard Fast
First published: 1951

Fast transformed the leader of the largest slave revolt in Roman history into a champion of egalitarian, progressive ideals. The novel is divided into two types of sections. Those told in the past tense present the recollections of Roman leaders of the failed attempts to quell the uprising and the terror it created throughout Italy. These accounts exhibit the political machinations and the class consciousness that eventually subverted the core values of the Roman Republic and led to the rise of the imperial state. The other sections are told in the present tense from the rebels' very different perspective. In contrast to the Roman vilification of Spartacus as a barbarous agent of civil disorder, to his followers he is an iconic figure, the embodiment of valor and honorableness.

Medieval World

Genghis
Author: Conn Iggulden
First published: 2007-2008

Called the Conqueror series in the United Kingdom, this series includes *Birth of an Empire* (2007), *Lords of the Bow* (2008), and *Bones of the Hills* (2008). It reconstructs the rise of Genghis Khan from the leadership of a small nomadic tribe to the master of the largest empire in human history. The series is notable both for the extensiveness of Iggulden's research and for his unobtrusive integration of that research into the narratives. Projecting this as a seven-volume series, Iggulden has indicated that he will focus on Kublai Khan in the fourth through sixth novels.

Ivanhoe
Author: Sir Walter Scott
First published: 1819

The most enduring work by the prolific and popular Scottish novelist, *Ivanhoe* is a Romantic historical novel set in twelfth century England. The title character is a Saxon knight who not only supports Richard, the Norman king of England, but also accompanies him on his crusades to the Holy Land. Ivanhoe and the Lady Rowena, a direct descendant of the last Saxon king, are very much in love, but Ivanhoe's father, who is also Lady Rowena's guardian, has disinherited him for his support of a Norman king and is scheming to marry her off to Lord Æthelstane, the most powerful Saxon lord in England.

Poem of the Cid
Author: Unknown
First published: c. 1140, as *Cantar del mío Cid*

The hero of this great epic poem is based on Rodrigo Díaz de Vivar. He emerged at the head of a private army of knights in the midst of the political chaos that marked the eleventh century efforts of the Spanish states to reconquer the Iberian Peninsula from the Moorish states. Rodrigo had to anticipate the shifting alliances and conflicts among the Spanish states, the Moorish states, and the outside forces that attempted to take advantage of the chaos. In the poem, this Machiavellian figure becomes a great patriot whose fidelity to his king and the nascent notion of a Spanish state is rewarded with ingratitude and even perfidy.

Romance of the Three Kingdoms
Author: Luo Guanzhong
First published: mid-fourteenth century, as *Sanguo zhi yanyi*

This epic novel treats the political turmoil and the military campaigns that followed the Yellow Turban Rebellion against the Eastern Han Empire. The three kingdoms of the title—Wei, Wu, and Shu—enter into a precarious and frequently broken truce. The fortunes of each of the kingdoms are shown to rise and fall not simply on the skills of their kings but even more on the skills of the military advisers serving those kings. The novel chronicles the many schemes and battles that lead eventually to the defeat of both the Shu and Wu kingdoms by the Wei and the ascension to power of Ssu-Ma Yen as the first Emperor of China.

The Saracen Blade
Author: Frank Yerby
First published: 1952

Although he has been much criticized for refusing to address issues of race in his fiction and although his early efforts and even some of his later novels can rightly be dismissed as historical romances or costume novels, Yerby was actually a fairly accomplished writer of historical novels. *The Saracen Blade* is a competent and even insightful treatment of the Crusades. Beyond some melodramatic inventions, Yerby demonstrates an awareness of the broad cultural conflicts that formed the backdrop to the specific battles and other historical events. Moreover, he takes pains to present a culturally balanced view of those events, representing with some nuances both the Christian and the Muslim perspectives on them.

The Tale of the Heiki
Author: Kakuichi
First published: 1371, as *Heike monogatari*

This classic epic of Japanese literature first appeared in oral versions, with the bulk of the composition being attributed, in the folk tradition, to a monk named Yukinaga. The most widely read and first authoritative written version, however, was completed by Kakuichi two centuries after the events described in the work. The main theme of *The Tale of the Heiki* is the Buddhist concept of impermanence, especially as it is reflected in the shifting centers of military and political power and in the stature of individual warriors. The work is a stylized account of the Gempei Wars (1180-1185), in which the Taira clan first defeated the Minamoto clan and then was defeated by it.

SPANISH CONQUEST

Aztec
Author: Gary Jennings
First published: 1980

Jennings's novel is the first in a five-novel series, which also includes *Aztec Autumn* (1998), *Aztec Blood* (2002), *Aztec Rage* (2006), and *Aztec Fire* (2008). The series chronicles the history of Mexico from the height of the Aztec Empire just before the Spanish conquest to the Mexican war for independence from Spain. The first novel is an account of the conquest from the point of view of an elderly Aztec survivor, filtered through the point of view of a Spanish bishop who is writing a report to the Spanish king. Since Hernán Cortés's conquest of Mexico is often regarded as one of the most improbable military adventures in history, *Aztec* fills a fictional void in attempting to reconstruct events from the perspective of the conquered.

FRENCH AND INDIAN WAR (SEVEN YEARS' WAR)

The Last of the Mohicans
Author: James Fenimore Cooper
First published: 1826

The Last of the Mohicans is one of Cooper's most enduring novels and one of the best-known novels about the French and Indian War. The novel emphasizes that most of the war was fought on the frontier, by colonial and Native American surrogates rather than by the French and British forces per se. In the wilderness setting, treachery and savagery reduced adherence to the "rules" of European warfare to a tragic sort of foolhardiness. In the novel's focal event, the British garrison at Fort William Henry surrenders, and the French allow the British safe passage out of the wilderness. The Huron allies of the French nonetheless ambush the British column and massacre almost everyone in it.

AMERICAN REVOLUTION

Drums Along the Mohawk
Author: Walter D. Edmonds
First published: 1936

One of the best-known novels about the American Revolution (1775-1783), *Drums Along the Mohawk* is set in the Mohawk River Valley of upstate New York, at that time the frontier between colonial settle-

ments and the territory of the Iroquois. Allied with the British and the Tory colonists who remained loyal to the British crown, the Iroquois terrorized the colonial settlers. Moreover, when the settlers banded together to present an effective fighting force, they had to leave their homes, their crops and animals, and sometimes their wives and children defenseless.

Napoleonic Wars

Horatio Hornblower series
Author: C. S. Forester
First published: 1937-1967

Chronologically, this is the second novel in the eleven-novel series following Horatio Hornblower's experiences as a British naval officer during the Napoleonic Wars. Published in 1952, *Lieutenant Hornblower* was the seventh novel of the series in order of publication but seems to have been the pivotal novel in terms of securing the popularity of the series on both sides of the Atlantic. Chronologically, the other novels in the series include *Mr. Midshipman Hornblower* (1950), *Hornblower and the Hotspur* (1962), *Hornblower and the Crisis* (1967), *Hornblower and the Atropos* (1953), *Beat to Quarters* (1937; also known as *The Happy Return*), *Ship of the Line* (1938), *Flying Colours* (1938), *Commodore Hornblower* (1945), *Lord Hornblower* (1946), and *Admiral Hornblower in the West Indies* (1958).

Master and Commander
Author: Patrick O'Brian
First published: 1969

This is the first in a series of twenty novels featuring Captain Jack Aubrey and surgeon Stephen Maturin, serving together with the British navy during the Napoleonic Wars. Considerably different from the film adaptation in 2003, the novel follows the career of the warship *Sophie* from helping to protect a convoy of British supply ships to preying on French merchant ships to a vicious battle with a Spanish warship to its dramatic capture by a squadron of French warships. The novel establishes three hallmarks of the series: O'Brian's great interest in the intricacies of naval politics, in the physical workings of ships of the period and the ways in which their crews functioned, and in the individual personalities of his characters.

Richard Sharpe series
Author: Bernard Cornwell
First published: 1981-2006

Set during the Napoleonic period, Cornwell's series follows the title character across several continents and a broad range of adventures and misadventures. Sharpe is introduced as a private serving with the British East India Company in India, serves in the extended campaigns against the French in Portugal and Spain, participates as a field-promoted officer in the Battle of Waterloo, and visits St. Helena and meets Napoleon on his way to Chile on a privately commissioned mission. The series was not initially published in chronological order. It eventually included twenty-one numbered novels and three numbered short stories, from *Sharpe's Tiger* to *Sharpe's Devil*.

War and Peace
Author: Leo Tolstoy
First published: 1865-1869, as *Voyna i mir*

The greatest war novel ever written, *War and Peace* treats Napoleon's invasion of Russia, which to that point was the greatest military undertaking and the greatest military debacle in human history. Told from the Russian point of view, with much attention to the class structure of Russian society, this twelve-hundred-page novel is equal to Napoleon's grand ambition and the size of his Grande Armée to the vastness of the Russian landscape and of the desolation left by the retreating Russian's "burned earth" policy and the great scope of the Russian effort, materially and morally, to drive the Antichrist from the motherland. Every ambitious war novel written since *War and Peace* has inevitably been compared to it and has been found wanting.

AMERICAN INDIAN WARS

The Court-Martial of George Armstrong Custer
Author: Douglas C. Jones
First published: 1976

The first novel by Jones, and the first novel in the trilogy that includes *Arrest Sitting Bull* (1977) and *A Creek Called Wounded Knee* (1978), *The Court-Martial of George Armstrong Custer* received the Golden Spur Award from the Western Writers of America. A speculative work of historical fiction, the novel proceeds from the premise that Custer managed to survive the massacre of most of his troopers at the Little Bighorn and was subsequently placed on trial for the recklessness with which he had placed his command in jeopardy.

The Panther in the Sky
Author: James Alexander Thom
First published: 1989

Thom has made a career out of writing historical novels about the opening of the American frontier in the first half of the nineteenth century. His most commercially and critically successful novel, *The Panther in the Sky* is a fictionalized biography of Tecumseh. Within the framework of chronicling the Shawnee chief's formative experiences, his decision to ally his tribe with the British during the revolutionary War and the War of 1812, and his partially successful attempt to unite the tribes of the Old Northwest against American expansion, Thom provides a poignant view of a still vibrant culture on the verge of near extinction.

COSSACK-POLISH CONFLICT

Taras Bulba
Author: Nikolai Gogol
First published: 1835, revised 1842

In this short novel, Gogol chronicles the military campaigns waged by the title character against the Poles, who are determined to dominate the Ukraine. A moving tale of determined armed resistance, a deeply ingrained spirit of independence, and a nascent sense of national spirit, the novel presents the Cossacks as archetypal Russians, with Taras and his sons playing out the sort of conflicts that often occur between great men and the sons who tragically attempt to emulate them or bitterly reject them. Thus, for all of its considerable historically accurate detail, the novel provides an idealized, if not distorted, view of the Cossacks before they became an instrument of Russian imperialism and oppression.

The Trilogy
Author: Henryk Sienkiewicz
First published: 1884-1888

Although Sienkiewicz received the Nobel Prize in Literature in 1905, he is remembered today primarily as the author of the international best seller *Quo Vadis* (1896). In his trilogy, Sienkiewicz synthesized the conventions of the historical epic with aspects of naturalism, then a relatively new literary movement derived from the controversial theories of scientific determinism. *Ogniem i mieczem* (1884; *With Fire and Sword*, 1890) focuses on a Cossack revolt against Polish rule. *Potop* (1886; *The Deluge*, 1891) treats a catastrophic Swedish invasion of Poland. *Pan Wołodyjowski* (1888; *Pan Michael*, 1893, also known as *Fire in the Steppe*, 1992) depicts the seventeenth century conflicts between Poland and the Ottoman Empire, which halted the Ottoman advance into eastern and central Europe.

INDIAN COLONIAL WARS

"Gunga Din"
Author: Rudyard Kipling
First published: 1892

The best known of Kipling's *Barrack-Room Ballads*, "Gunga Din" focuses on the hard existence and unexpected nobility of an Indian water carrier for the British forces on the Afghan frontier. The poem exploits the fact that the title character is regarded as an

inferior by most soldiers in the army that he serves and that, when he is noticed, it is generally as the target of indignities. The narrator of the poem, however, recounts how this unlikely figure heroically gave his life to save the lives of the narrator and many of his fellow soldiers.

The Siege of Krishnapur
Author: J. G. Farrell
First published: 1973

Set during the Indian Mutiny or Sepoy Rebellion of 1857, Farrell's novel focuses on the siege of a small fictional town. Told from the points of view of the British residents of the besieged town, the novel shows how those residents struggle to continue their daily lives without the Indian laborers on whom so much of their social rituals and basic comfort depend. Despite the inevitable leveling effects of the siege, the residents are also unable to let go of their class consciousness. Even cholera, scurvy, and general starvation are not enough to subvert completely their ingrained notions of who they are—which is, ironically, what dooms both the town and the rebellion to which it falls victim.

Crimean War

"The Charge of the Light Brigade"
Author: Alfred, Lord Tennyson
First published: 1855

As part of his duties as the British poet laureate, Tennyson produced poems on events of national interest. This poem celebrates the heroism of British cavalry that charged down a valley into Russian artillery fire during the Battle of Balaclava. The battle occurred during the Crimean War, which is now largely remembered as the only conflict involving most of the major European powers between the Napoleonic Wars and World War I. Tennyson's poem turned a military debacle into an iconic, if tragic, demonstration of national character.

American Civil War

Amalgamation Polka
Author: Stephen Wright
First published: 2006

In what may be the first truly postmodern novel to treat the American Civil War, Wright focuses on the misadventures of Liberty Fish, an abolitionist who, as soon as he is old enough, predictably enlists in the Union army. What makes Liberty's situation rich with ironic possibilities is the fact that, although his parents are staunch abolitionists, his maternal grandparents are unapologetic slave owners, and his paternal grandparents are textile manufacturers who owe their fortune to slave-produced cotton from the Southern plantations. Wright stresses that despite the unprecedented scale and complexity of this terrible conflict, it both created and was created out of complicated, multilayered antagonisms that divided individual families and the tangled internal conflicts with which its combatants struggled even as they raised arms against each other.

Andersonville
Author: MacKinlay Kantor
First published: 1955

For this historical novel about the horrors endured by Union prisoners of war in the prison camp near Andersonville, Georgia, Kantor received the Pulitzer Prize. Although Kantor drew on historical sources (such as 1879's *Andersonville: A Story of Rebel Military Prisons,* by John McElroy) that were largely biased in favor of Northern antipathy toward the Confederates, his novel is notable for his attempt to present balanced portraits of the key historical figures, especially the vilified camp commandant, Henry Wirz. Likewise, the novel provides a broad spectrum of fictional figures representative of the factions among the prisoners and even among the residents of the surrounding countryside.

Cold Mountain
Author: Charles Frazier
First published: 1997

Set in the closing months of the American Civil War, this debut novel by Charles Frazier juxtaposes the stories of W. P. Inman, a wounded Confederate veteran who decides to desert, and his love interest, Ada Monroe, who has moved from Charleston to the supposed safety of the mountains of North Carolina. As Inman travels the 250 miles to Cold Mountain and Ada, he confronts all sorts of scurrilous characters and is hounded by the Home Guard. Meanwhile, Ada has to cope with her father's death and survives largely because of her growing friendship with a mountain woman named Ruby Thewes. The lovers reunite but only long enough for her to become pregnant with his child.

The Killer Angels
Author: Michael Shaara
First published: 1974

In this sprawling novel, Shaara attempted to describe the Battle of Gettysburg from the perspectives of as many of the combatants as possible. The result is an intimate sense of the intensity with which the battle was fought, the confusion that very often caused opportunities to be lost or advantages to be gained by both sides, and the terrible carnage that the soldiers on both sides somehow managed to endure even when it became clear that the battle was moving toward some climactic slaughter—which turned out to be Pickett's Charge. The novel received the Pulitzer Prize and was adapted for a landmark television miniseries.

The March
Author: E. L. Doctorow
First published: 2005

In his previous novels, Doctorow has experimented with the conventions of the historical novel and has brought a postmodern sensibility to his treatment of historical subjects and to his fictional reconstruction of historical eras. In this novel, which depicts General William Tecumseh Sherman's devastating march across Georgia in the fall of 1864, Doctorow explores the paradoxes in Sherman's public persona, the ambiguities in his personal character, and the complexities in his temperament. Sherman is more a focal than a truly central character, however, for the novel presents characters representative of the many types of people affected by the devastation of a sixty-mile-wide and three-hundred-mile-long section of Georgia by sixty thousand loosely controlled troops.

The Red Badge of Courage
Author: Stephen Crane
First published: 1895

The best-known and most critically acclaimed novel about the American Civil War, *The Red Badge of Courage* was a largely imaginative work, inspired by Crane's fascination with photographs of the battlefields and his dissatisfaction with the generally dry reminiscences of veterans. The short novel focuses on a young soldier named Henry Fleming. In his second battle, he breaks from the Union lines as the Confederates attack. Finding himself among either other deserters or the wounded, he is embarrassed by his lack of a wound. However, an argument with an artillery man leaves him with a gash in the head, and when he returns to his unit, his injury is accepted as a battle wound. In the next day's battle, Fleming becomes almost recklessly courageous, inspiring his fellow soldiers and impressing their officers.

SPANISH-AMERICAN WAR

Cuba Libre
Author: Elmore Leonard
First published: 1998

Leonard's novel was published on the hundredth anniversary of the event that made the Spanish-American War inevitable, the explosion on the battleship *Maine* in Havana harbor. Although Leonard had begun his career as a novelist writing Westerns, this foray into the genre of the historical novel at the height of his fame as a crime novelist surprised reviewers and readers. However, the novel explores familiar Leonard themes—in particular, the way that most moneymaking schemes inevitably become

more complicated and corrupting. In this instance, two cowboys set out from Arizona to deliver thirty-one horses to a Cuban plantation. When the purchaser reneges on the deal, they keep trying to recoup their losses and end up in the middle of the wars between the Spanish and the Cuban insurgents and then between the Spanish and the invading Americans.

Boer Wars

Ladysmith
Author: Giles Foden
First published: 1999

In this, one of the most significant novels about the Boer War, Foden focuses on the lengthy Boer siege of the British town of Ladysmith. The siege followed some early Boer victories over the British, which surprised not just the British military and government but also observers from all over the world. The outcome of the siege became a critical issue for the British and the Boers, not only because the town was located near the Boer republics and strategically important but also because of the psychological effect of a clear victory for the Boers or even a stalemate for the British.

Russian Revolution and Civil War

Doctor Zhivago
Author: Boris Pasternak
First published: 1957

Pasternak's epic novel treats the Russian Revolution and the Civil War between the Red and White forces that followed it. In the half decade between 1917 and 1922, imperial Russia was wrecked and the Bolsheviks created the Soviet Union at the cost of several million of lives. Most of the dead not were combatants but civilians unable to escape the carnage or unable to survive on the devastated landscape that was its aftermath. Pasternak's protagonist, a physician and a poet, represents those who somehow managed to survive but at a considerable physical and psychological cost.

Mexican Revolution

The Underdogs
Author: Mariano Azuela
First published: 1916, as *Los de abajo*

Written while Azuela served as a surgeon with Pancho Villa's forces in northern Mexico in the mid-1910's, this novel is not only the most significant work about the decade-long Mexican Revolution but also one of the most influential works of social protest in Mexican and Latin American literature. Azuela conveys the massive dislocations of the population caused by the almost continuously shifting alliances that made each successive leader's hold on power very tenuous. Likewise, he captures the extraordinary brutality of the conflict, which was fueled as much by feverishly confused ideologies as by ideological fervor.

World War I

All Quiet on the Western Front
Author: Erich Maria Remarque
First published: 1929

One of the most highly regarded novels to come out of World War I, *All Quiet on the Western Front* is also one of the few German novels about that war to have been made widely available in translation. It focuses on a group of school friends who are encouraged to enlist for idealistic reasons that quickly seem bitterly delusory amid the carnage of trench warfare. When the soldiers return to their homes on leave, they realize that in going off to save their homeland, they have lost all connection to home.

Birdsong
Author: Sebastian Faulks
First published: 1993

This novel is the middle volume of Faulks's French Trilogy, which also includes *The Girl at the Lion d'Or* (1989) and *Charlotte Gray* (1998). The most commercially successful and critically acclaimed novel of the trilogy, *Birdsong* has, moreover, been one of the most popular and most highly

regarded British novels of the last quarter century. The main character is Stephen Wraysford, and the primary focus is on his experiences during World War I, especially during the great British offensive along the Somme. A parallel narrative concerns the efforts of his granddaughter, Elizabeth, to learn about his wartime experiences more than a half century later.

The Blue Max
Author: Jack D. Hunter
First published: 1964

Hunter's first novel charts the rise and fall of Bruno Stachel, a German fighter pilot during World War I. Unlike most of the original fighter pilots, who were aristocrats, Stachel comes from a working-class background and begins his wartime service as an infantryman. When the air losses create a demand for pilots, he not only seizes the opportunity to escape the carnage of the trenches but also becomes determined to compile the twenty "kills" required to win the Blue Max, an award reserved for Germany's most highly honored air aces. Stachel's ruthless pursuit of his goal involves him in all sorts of machinations—military, political, socioeconomic, and sexual.

The Case of Sergeant Grischa
Author: Arold Zweig
First published: 1927, as *Der Streit um den Sergeanten Grischa*

Part of the six-volume series *The Great War of White Men*, this satiric novel follows the title character, a Russian soldier being held in a German prisoner-of-war (POW) camp, as he makes his escape and attempts to make his way back to his homeland. When he is eventually captured, he identifies himself as a deserter to avoid being sent back to the POW camp. Because he is illiterate, however, he has been unable to read the posted notices that deserters who have failed to report to German authorities are to be shot as spies. What follows is a trial and then a series of reversed decisions as the military bureaucracy tries to decide whether he ought to be executed.

Clerambault: The Story of an Independent Spirit During the War
Author: Romain Rolland
First published: 1920, as *Clérambault: Histoire d'une conscience libre pendant la guerre*

Most remembered for his ten-novel cycle *Jean Christophe* (1904-1912), Rolland received the Nobel Prize in Literature in 1915. Five years later, this novel presented a powerful indictment of all wars. The major character struggles to come to terms with his son's death in combat during World War I. Throughout the novel, father and son are out of step. Initially, the father is skeptical about the causes and ramifications of the war, while his son is stirred deeply by a sense of the momentousness of the war. Then as the son experiences the horror of the trenches and becomes profoundly disenchanted, the father finds himself searching for ways to express his heightened patriotism. In the end, the main character embraces pacifism and is accused of being traitorous.

Collected Poems
Author: Rupert Brooke
First published: 1915

One of the best-known British poets of World War I, Brooke was twenty-seven when he died of blood poisoning on his way to the battlefield at Gallipoli. He had experienced relatively little of the horrors of the trench warfare that would transform much of northern France into a muddy, carnage-strewn wasteland. Shortly before he died, Brooke wrote a series of patriotic sonnets that captured the intense patriotism and naïveté of prewar Britain. The most remembered of these sonnets are "Peace," "Safety," "The Dead," and "The Soldier," considered by most to be Brooke's signature poem.

The Complete Poems of Wilfred Owen
Author: Wilfred Owen
First published: 1963, edited by C. Day Lewis

Owen served on the western front in 1916 and 1917, participating in the Battle of the Somme. While recuperating from shell shock, Owen met Siegfried Sassoon, who influenced Owen's composition of a series of poems in which he sought to describe his own wartime experience and to emphasize the "pity"

underlying all battlefield experience. Only a few of these poems were published before Owen returned to the front, where he perished one week before the Armistice. His best-known poems include "Anthem for Doomed Youth," "Dulce et Decorum Est," and the never completed "Strange Meeting."

The Enormous Room
Author: E. E. Cummings
First published: 1922

In this autobiographical novel, Cummings recreates his four-month imprisonment in France during World War I. A volunteer ambulance driver, Cummings was the recipient of a series of letters from another driver who in very strong terms denounced the war. Although Cummings himself was simply the recipient of these letters, he along with the writer was imprisoned on suspicion of disloyalty to the Allied cause. Following American diplomatic intervention, Cummings was released and returned to the United States just as the entry of American troops into the Allied effort on the western front was escalating.

A Farewell to Arms
Author: Ernest Hemingway
First published: 1929

Hemingway's novel is set in northeastern Italy, in the region surrounding the Isonzo River, where a series of great battles were fought between the Italian and Austro-Hungarian forces during World War I. The main character is Frederic Henry, an American serving as a volunteer with the Italian ambulance corps. While he is recuperating from wounds, he falls in love with an English nurse, Catherine Barkley. Eventually he returns to the front lines, but the anarchic brutality that follows an Italian retreat from the Isonzo convinces him to flee to neutral Switzerland with Catherine, who is pregnant with their child. The child is stillborn, and Catherine dies in childbirth.

The Good Soldier: Švejk
Author: Jaroslav Hašek
First published: 1921-1923, as *Osudy dobrého vojáka Švejka za světove války*

When the Czech writer Jaroslav Hašek died of tuberculosis in 1923, he had completed only four of the projected six books about Švejk (often rendered as Schweik). The four completed books have subsequently been published for the most part as a single book. The tone of the work is clearly satiric, with Schweik repeatedly demonstrating the ridiculousness of the Austro-Hungarian military, its other institutions, and the continued viability of the empire itself. Hašek is able to sustain the satire because Schweik remains an ambiguous figure; that is, one is never sure whether he is a clever malcontent or is simply an imbecile who accidentally or coincidentally makes those around him seem ridiculous.

"In Flanders Fields"
Author: John McCrae
First published: 1915

The best-known poem about World War I, "In Flanders Fields" was written by a Canadian physician, John McCrae, who was serving as a battlefield surgeon with the British forces in Belgium. Following the very costly Second Battle of Ypres, during which one of McCrae's closest friends was killed, McCrae wrote "In Flanders Fields" as a memorial to his dead friends and, by extension, to all of the war dead. A practiced poet and a military veteran who had served during the Boer War, McCrae captured the terrible pathos of war while avoiding the usual bromides about the glorious sacrifices made by the war dead. In the last year of the war, McCrae himself died from pneumonia.

Parade's End
Author: Ford Madox Ford
First published: 1924-1928

Ford may be most remembered for *The Good Soldier* (1915), which remains one of the most cited illustrations of the use of an unreliable narrator, but this tetralogy of novels about a British officer's experiences in the trenches during World War I is arguably his masterwork. The main character is Christopher Tietjens, the scion of prominent family of Tory gentry, and the novels trace his deepening preoccupation with sustaining both his commitment to the war and his determination to conduct himself honorably. The four novels of the tetralogy include *Some Do Not* (1924), *No More Parades* (1925), *A Man Could Stand Up* (1926), and *The Last Post* (1928).

Paths of Glory
Author: Humphrey Cobb
First published: 1935

Published in the mid-1930's when another world war seemed to be increasingly inevitable, *Paths of Glory* offered a scathing indictment of military culture and command structure. Set in World War I, the story hinges on a French general's first ordering an impossible attack against a German position and then ordering the execution of forty arbitrarily selected French soldiers as a punishment for the "cowardice" evident in the failure to achieve the attack's objective. In Stanley Kubrick's film adaptation, Colonel Dax, the commander of the units that spearheaded the attack, provides an uncompromisingly moral perspective, but in Cobb's novel, he is more ineffectual, mitigating only by degrees what is unambiguously morally outrageous.

Regeneration Trilogy
Author: Pat Barker
First published: 1991-1995

Barker's highly regarded trilogy includes *Regeneration* (1991), *The Eye in the Door* (1993), and *The Ghost Road* (1995). The first novel was a finalist for the Booker Prize, and the third novel received that prize. The trilogy about World War I is set primarily in a British army hospital, where a psychiatrist named W. H. R. Rivers attempts to treat soldiers suffering from shell shock. One of his patients is the aristocratic poet Siegfried Sassoon, whose commitment to the facility has kept him from being tried for treason for publicly expressing his increasingly virulent antiwar sentiments. At the opposite end of the spectrum is the working-class character Billy Prior, whose premonitions about his terrible death in the trenches manifest themselves first in indiscriminate sexual affairs and then in bisexuality.

A Soldier of the Great War
Author: Mark Helprin
First published: 1991

The title character, now an elderly man on his way to visit his daughter, impulsively joins a much younger man on a seventy-kilometer walk to their destinations. Along the way, the title character reminisces about his life and, in particular, recounts his experiences during World War I. Having enlisted in the navy to avoid the carnage of the ground war, he was assigned to a riverboat patrolling first near the Austrian front to monitor enemy movements and then in Sicily to apprehend deserters. He himself eventually becomes a deserter, barely escapes execution, serves with the infantry, is wounded, falls in love with a nurse who is killed in an air attack on her hospital, and ends up after the war in Vienna, tracking down the pilot responsible for her death.

Three Soldiers
Author: John Dos Passos
First published: 1921

One of the most significant American novels about World War I, *Three Soldiers* is, in contrast to the modernist experimentation with form and language in *Manhattan Transfer* (1925) and *The U.S.A. Trilogy* (1937), a work set squarely in the realist tradition. The three soldiers of the title are Andrews from Virginia, Chrisfield from Indiana, and Fuselli from California. The novel describes the ways in which the soldiers' training and the authoritarian regimen of military life combine to reduce their sense of individuality and of the significance of their individual fates. Despite their very different temperaments and ambitions, all three soldiers are left irreparably brutalized by their experiences in uniform.

Under Fire
Author: Henri Barbusse
First published: 1916, as *Le Feu*

Written while Barbusse was still serving in the trenches with the French army during World War I, *Under Fire* imitates the form and style of a journal, and its narrator moves anecdotally from one day's experiences to the next. The narrator is a member of a squad of French "volunteers" who responded patriotically to the German invasion and try to maintain their sense of purpose in the midst of a conflict that has acquired a scope terribly beyond any cause. The novel is notable for its unsparingly realistic descriptions of the hardships of life in the trenches and the carnage of trench warfare.

The Wars
Author: Timothy Findley
First published: 1977

The recipient of the Governor-General's Award for fiction, Findley's novel stands as one of the major Canadian works about World War I, even though it was published just short of six decades after the Armistice. Like Wallace Stegner's *Angle of Repose* (1971), *The Wars* is framed as a historian's reconstruction of past events—in this case, the mysteries surrounding the last days in the life of a young officer named Robert Ross. Stationed on the western front, Ross is increasingly traumatized by the cumulative effect of his wartime experiences. Following his gang rape by a group of soldiers, he "madly" sets free a corral of horses and shoots dead the officer who tries to stop him. He and the horses are eventually caught in a barn, and when it is set on fire, Ross suffers terrible burns, from which he ultimately dies.

Chinese Civil War

The Sand Pebbles
Author: Richard McKenna
First published: 1962

After serving in the U.S. Navy for more than twenty years, McKenna began to write fiction, producing primarily novels and short stories in the science-fiction genre. This novel is one of the few works in which he drew directly on his own military experience, and he died before the novel was adapted for a very successful film starring Steve McQueen. The title of the novel is a colloquial rendering of the name of the river gunboat on which the main character is serving, the USS *San Pablo*. While patrolling the Yangtze River in the late 1920's, the gunboat becomes enmeshed in the rising tensions and increasingly open conflict between the Chinese nationalists and communists.

Spanish Civil War

For Whom the Bell Tolls
Author: Ernest Hemingway
First published: 1940

The best-known novel about the Spanish Civil War of the 1930's, *For Whom the Bell Tolls* is set among the partisans fighting behind the Fascist lines on behalf of the Republican cause. The main character is Robert Jordan, a munitions expert with the International Brigade, who is sent to join a group of partisans who are to provide support in his demolition of a bridge. The Republican forces are set to launch an offensive, and destroying the bridge will prevent the Fascists from rushing reinforcements to the sector against which the offensive is being launched. The novel emphasizes the psychological strain that this merciless conflict exerted on combatants and civilians alike.

Homage to Catalonia
Author: George Orwell
First published: 1938

In this memoir of his experiences during the Spanish Civil War, Orwell focuses as much on the divisions on the Republican side as on the battles fought between the Republican and Fascist forces. A communist who was opposed to Stalinism, Orwell joined the POUM militia on the Republican side, but in less than a year after his arrival in Spain, the Republican leadership had outlawed POUM because the Republican cause had become increasingly dependent on Soviet aid and dominated by Soviet "political advisers." After barely escaping a Stalinist "purge" of anti-Stalinist elements on the Republican side, Orwell became a lifelong critic of totalitarian communism.

SINO-JAPANESE WAR

Empire of the Sun
Author: J. G. Ballard
First published: 1984

The protagonist of this autobiographical novel is Jim Graham, a British boy who is living with his parents in Shanghai when the Japanese overwhelm the city. Separated from his parents, Jim is eventually picked up by the Japanese and sent to a civilian detention center. The novel chronicles the ways in which he learns to survive by his wits and sometimes manages to survive by sheer luck. Despite his awareness of the brutality of his Japanese captors, the boy inevitably admires their proud bearing and martial discipline. The novel vividly depicts the deprivation of the war's final months and the uncertainty of its closing weeks.

Music on the Bamboo Radio
Author: Martin Booth
First published: 1997

Like J. G. Ballard's *Empire of the Sun*, Booth's novel treats the Sino-Japanese War that merged into the broader war in Asia and the Pacific between the Allies and the Japanese. Also, like Ballard, Booth has chosen to depict these events through the perspective of an English boy separated from his parents by the Japanese attack against the city in which they are living, in this case Hong Kong. Unlike Ballard's protagonist, however, Nicholas Holford ends not in a detention camp but adopted by a Chinese family, and he becomes increasingly involved in sabotage and other clandestine activities of Chinese Communist partisans.

Red Sorghum
Author: Yan Mo
First published: 1992

Set in rural China during the period of the Japanese invasion and occupation, *Red Sorghum* was originally published as a series of four short novels. The sorghum crop is at the center of the novel, literally as well as symbolically, for the survival of the Chinese village depends on it, but the fields in which it is planted are the scene of both a Japanese massacre and a nearly suicidal but successful retributive attack by the peasants and partisans. Yan's narrative style is modernist in its experimentation with chronology and point of view, but his style owes much to Magical Realism. The color red is omnipresent, from the sorghum itself to the flamboyantly vivid descriptions of the mutilating effects of violence.

WORLD WAR II

Armageddon
Author: Leon Uris
First published: 1964

In this, his fifth, novel, Uris provides a contemporary history of the city that a quarter century earlier had become the monument-dominated capital of Adolf Hitler's Third Reich. The grandiose plans of Hitler and his architects had just begun to be realized, however, when the city became a favorite target of the Allied air war against Germany. Then, although largely reduced to ruins, it became the setting for the war's climactic and bloodiest battle. Following that apocalyptic framing of Hitler's suicide, it then was rebuilt, but as an occupied and militarily divided city that became a symbolic as well as actual focal point of Cold War tensions.

Battle Cry
Author: Leon Uris
First published: 1953

Based on Uris's own combat experience as a Marine, this novel focuses on a communications company of the Sixth Marine Regiment, following its members from boot camp through some of the bloodiest battles of the Pacific campaigns in World War II—Guadalcanal, Tarawa, and Saipan. The novel is narrated by the company's battle-hardened sergeant, and it follows the pattern of many GI novels in emphasizing the ethnic diversity among the men in the company, which includes a farm boy from Indiana, a Native American, and a Chicano.

Beasts of No Nation
Author: Uzodinma Iweala
First published: 2005

Relatively young boys have sometimes been enlisted into armies desperate for manpower (such as the German Home Guard in the closing months of World War II), but the forced recruitment of very young boys, even preadolescents, as a deliberate strategy for creating an easily indoctrinated fighting force is a relatively recent phenomenon seen primarily among insurgents in a number of African and several Asian nations. Iweala's novel is set in a West African nation. It is narrated by a boy soldier who loses his childhood and almost loses all sense of himself amid the commonplace horrors of a war as ill-defined as his terror-sustained allegiance to his commander.

A Bell for Adano
Author: John Hersey
First published: 1944

That Hersey's novel, published in wartime, was awarded the Pulitzer Prize in 1945, as World War II was drawing to a close, suggests the sort of appeal that it initially had. The novel is set in Italy after the Americans and British have driven the German forces back to the Italian mainland. The main character, an Italian American officer, becomes committed to replacing the bell in a village church that had been confiscated by the Fascists to be melted down and recycled into munitions. Although still admired for its craftsmanship, the novel has been increasingly regarded as the sort of approbative tale that is, in effect, a type of relatively benign propaganda.

Black Rain
Author: Masuji Ibuse
First published: 1966, as *Kuroi ame*

In Japan, Ibuse remains an important literary figure of his generation, though he has not achieved the stature, through translation into English and other Western languages, of some of his contemporaries. Drawing on the diaries of survivors of the atomic bombing of Hiroshima, Ibuse created a masterpiece of documentary realism in *Black Rain*. The central characters are an elderly man and his niece, whose determined attempts to reconstruct their lives from the absolute devastation of the bombing are shadowed by the specter of the long-term effects of the "black rain," or radioactive fallout from the atomic blast.

Bomber
Author: Len Deighton
First published: 1970

Although Deighton may be best known for his series of Cold War espionage novels featuring Bernard Samson, he is also the author of several novels and nonfiction books about World War II. Indeed, according to several critics, *Bomber* may be his most accomplished novel. It focuses on a single Royal Air Force bombing raid against the German industrial plants in the Ruhr Valley. The chapters follow the progress of the raid from hour to hour, and the suspense is heightened by the crews' increasing awareness that the raid is not going as planned.

The Bridge over the River Kwai
Author: Pierre Boulle
First published: 1952, as *Pont de la rivière Kwai*

Although Boulle's novel won the Prix Sainte Beuve and was adapted for an acclaimed film, it has continued to generate controversy. The novel deals with the hurried construction of a railroad between Bangkok, Thailand, and Rangoon, Burma, to support the Japanese conquest of Burma during World War II. The massive project was completed with almost no heavy machinery. Instead, the Japanese relied on native conscripts and Allied prisoners of war to complete the work with rudimentary tools. The controversy surrounds Boulle's suggestion that Allied officers in effect collaborated with the Japanese in an ill-conceived effort to protect their men.

The Brotherhood of War
Author: W. E. B. Griffin
First published: 1983-2001

Griffin is the pseudonym of William Edmund Butterworth III, who has written more than a half dozen popular series of novels, most of which focus on the military. This series of nine novels follows a group of American Army officers who initially served as lieutenants during World War II and re-

mained in the military through the immediate post-Vietnam era. The series is notable because its primary emphasis is not on the combat experiences of these officers, though that certainly is described, but, instead, on the tactics and strategies required to work changes through the military and political bureaucracies.

The Caine Mutiny
Author: Herman Wouk
First published: 1951

This Pulitzer Prize-winning novel has also been commercially successful and critically acclaimed in its adaptations to stage and screen. The *Caine* is an outdated destroyer refitted to serve as a minesweeper. The story centers on a mutiny that occurs while the ship is under the command of Captain Queeg, a petty tyrant, who uses the service manual to intimidate and humiliate his subordinates. Much worse, he seemingly exhibits cowardice under fire and, at the time of the mutiny, during severe weather. The genius of Wouk's story is that he shows that the mutineers have their own character flaws and self-serving motives.

Castle Keep
Author: William Eastlake
First published: 1965

Just before the Battle of the Bulge, a loosely organized group of American soldiers are taken out of the front lines and billeted at a Belgian estate for much-needed rest and recuperation. Initially the owners of the estate welcome the soldiers as protectors, but when the German offensive in the Ardennes begins and the American commanding officer decides to turn the estate into a fortified position, the owners recognize that he is putting at great risk not just the lives of his soldiers and their own lives but also the estate and all of the irreplaceable artwork and family heirlooms that their mansion contains. The novel also explores the tension in each soldier between conditioned discipline and unit cohesion, and self-assertion and self-preservation.

Catch-22
Author: Joseph Heller
First published: 1961

This antiwar novel was published just before the escalation of the Vietnam War and is associated with the antiwar movement. However, it is actually a novel about World War II. Specifically, it satirically treats the experiences of American bomber crews in the Mediterranean theater. The title, which has passed into the general lexicon, refers to the circular logic of bureaucratic policies. Specifically, if an airman contends that he is too crazy to fly any more missions, he has, in effect, proved his sanity because no sane person would want to continue flying missions, given the losses that the bomber force is suffering. The main character, a bombardier named Yossarian, struggles against the insanity of his wartime experience until he finally decides that his only viable option is to "disappear."

Cryptonomicon
Author: Neal Stephenson
First published: 1999

This massive novel (918 pages in hardcover) presents two parallel stories. The first follows the efforts of the British cryptographers based at Bletchley Park who eventually cracked the complex codes produced by the Nazi Enigma machine. That extremely complex device was used to communicate with the U-boat fleet that was devastating the British merchant fleet, the United Kingdom's main source of military supplies and foodstuffs. The second story is set in the near future and concerns an effort to use computer-driven cryptography to create an impenetrable data center in a nation called Kinakuta, which resembles the East Indian Kingdom of Brunei.

"The Death of the Ball Turret Gunner"
Author: Randall Jarrell
First published: 1945

Given the great scope and length of many of the most acclaimed American novels about World War II, it is ironic that this, one of the best-known American poems about the war, is only five lines long. The ball-turret gunner operated a machine gun that swiveled 360 degrees within a plexiglass hemi-

sphere attached to the bottom of the B-27 bombers that were the mainstay of the American forces in the costly air war against Germany. The gunner was an easy target, and the ball turret was often very difficult to escape when a bomber was badly damaged.

The End of My Life
Author: Vance Bourjaily
First published: 1947

Bourjaily's first novel caused reviewers to make complimentary comparisons to Ernest Hemingway's *A Farewell to Arms* (1929), and for several decades it was regarded as one of the best American novels about World War II. The novel's standing has, however, declined in proportion to the decline in Bourjaily's broader reputation as a novelist. An autobiographical novel, *The End of My Life* presents the experiences of Skinner Galt, an ambulance driver in North Africa, who eventually recognizes that whatever meaning war may have on a political level, it is always an exercise in horrible absurdity for the individual soldiers.

Execution
Author: Colin MacDougall
First published: 1958

One of the most acclaimed Canadian novels about World War II, *Execution* was MacDougall's only novel. It follows a Canadian infantry unit through the course of the Italian campaign, and, dramatically and thematically, it revolves around two executions. The first is the execution of two Italian deserters that the Canadians have adopted into their unit as cooks and genuinely like. The second is the execution of one of their own, a goodhearted but mentally limited soldier who has become involved with a group of soldiers engaged in the black market who murder an American.

Fires on the Plain
Author: Shōhei Ōoka
First published: 1951, as *Nobi*

Set in the Philippines following the American invasion to retake the islands from the Japanese, this novel vividly details the experiences of a single Japanese soldier, Private Tamura. Ostracized by the soldiers in his unit, Tamura decides to desert and finds himself caught between the ambiguous battle lines, between soldiers on two sides who equally despise him and among a civilian population conditioned to hate him. His only recourse is to flee ever more deeply into the jungle, where survival is a more primal exercise and spectral experience than it is even on the battlefield.

From Here to Eternity
Author: James Jones
First published: 1951

Jones's first novel remains his best known. The first in a somewhat loosely connected trilogy, *From Here to Eternity* focuses on a group of American soldiers stationed in Hawaii in the months leading up to the Japanese attack on Pearl Harbor. The main characters are Sergeant Milt Warden, who becomes involved in an affair with the wife of his commanding officer, and Private Robert E. Lee Prewitt, who resists all sorts of pressure to fight on the company's elite boxing team. Though it focuses of these and other individual soldiers, the novel is ultimately concerned with the prewar army as a self-defined institution.

The Gallery
Author: John Horne Burns
First published: 1947

Set in Naples after the American occupation of the city, the novel treats the relationships among American soldiers and between those soldiers and the civilian population in and around the Galleria Umberto Primo, an arcade of shops and bars at the center of the city. The novel's opening and closing sections are called the "Entrance" and "Exit," and the intervening chapters shift between nine chapters called "Portraits" and eight transitional sections called "Promenades." Each "Portrait" focuses on the tensions that define an individual character, and each "Promenade" recounts, in the first person, a soldier's experiences from the North African theater to Sicily to the invasion of Italy.

Guard of Honor
Author: James Gould Cozzens
First published: 1948

This Pulitzer Prize-winning novel by Cozzens has long been regarded as one of the more significant American novels about World War II. Drawn broadly from Cozzens's own experience as an information officer for General Henry H. "Hap" Arnold, the commander of the U.S. Air Forces during the war, the novel remains one of the few to focus on the stateside military during the war. It centers on three days' events on a Florida air base, emphasizing the ways in which the military bureaucracy and the personalities of individual officers intersect to define each other.

Gunner Asch Tetralogy
Author: Hans Hellmut Kirst
First published: 1954-1955, 1964

A committed Nazi who gradually became increasingly disaffected by the regime's excesses and its corruption of German institutions, Kirst is now best known for his suspense novels, such as *Night of the Generals* (1963), but all of his novels have satiric elements, and the satire is very close to the surface in the Gunner Asch novels, for which he first received international acclaim. The first three novels were published as a trilogy called *Zero Eight Fifteen* (1955-1957). They include *The Revolt of Gunner Asch* (1955), *Forward, Gunner Asch!* (1956), and *The Return of Gunner Asch* (1957). These novels concern the increasingly absurd experiences of the title character, an enlisted man serving on the eastern front. A fourth volume, *What Became of Gunner Asch* (1964), follows the protagonist into the postwar years.

Hiroshima
Author: John Hersey
First published: 1946

Now considered a forerunner of such movements or genres as the New Journalism, the nonfiction novel, and creative nonfiction, this slender volume sparely but movingly documents the aftermath of the dropping of the first atomic bomb on the Japanese city of Hiroshima. Originally written as a four-part article for *The New Yorker*, Hersey's book was not the first account of the atomic bombing, but it was the first account to focus on the recollections of Japanese survivors. Ironically, this aspect of the narrative, which has ensured its continuing appeal, was originally a point of concern for critics who thought that Hersey was characterizing the "enemy" too sympathetically.

The Hope *and* The Glory
Author: Herman Wouk
First published: 1993 and 1994 respectively

This pair of novels has not achieved anywhere near the commercial success or even the critical recognition of Wouk's earlier pair of novels about World War II, *Winds of War* (1971) and *War and Remembrance* (1988). Nonetheless, these novels are marked by a thorough, albeit pro-Israeli, understanding of the historical events and figures that shaped the first four decades of the existence of the modern state of Israel. *The Hope* covers the events from the 1948 War of Independence up to the Six-Day War of 1967, while *The Glory* covers events from the Yom Kippur War (1973) through the peace agreement between Israel and Egypt. The complicated love lives of the two main fictional characters provide contrived melodrama that is the novels' main weakness.

Johnny Got His Gun
Author: Dalton Trumbo
First published: 1939

This antiwar novel was published in 1939 as World War II became inevitable, but the novel actually concerns an American soldier, Joe Bonham, terribly—almost inconceivably—injured by a shell blast in the trenches of World War I. Bonham has lost all of his limbs and, because of massive injuries to his face, all of his senses except for the ability to feel someone touching him. Nonetheless, his mind remains intact, and the novel presents his thoughts as he comes to terms with the horror that he is completely isolated in what remains of his own body. The novel was withdrawn from publication after Nazi Germany invaded the Soviet Union, and because Trumbo was blacklisted during the 1950's it was not released again until the Vietnam era.

The Jukebox Queen of Malta
Author: Nicholas Rinaldi
First published: 1999

The tiny, British-controlled island of Malta became strategically important during World War II because it lay across the supply routes from Fascist Italy to Libya, where the German Afrika Korps had reversed early British victories and was threatening Egypt and the Suez Canal. The island was subjected to one of the longest sieges of the war, with German bombers reducing many of the mostly stone buildings to rubble. The main character is an American radio operator who begins a passionate relationship with the title character, a woman who travels around the island repairing jukeboxes.

King Rat
Author: James Clavell
First published: 1962

Clavell's first novel is drawn from his own experiences as a prisoner of war held for three years by the Japanese at the notorious Changi Prison in Singapore. The title character is an American corporal, generally referred to as "the King," who has transformed his detention into a business opportunity and has created a thriving business in black-market goods. The ranking British officer in the camp rightly views this black market as an exploitation of other prisoners' miseries, and he becomes determined to prove that the King is guilty of collusion with the enemy. The pivotal character is the narrator, a young British officer named Peter Marlowe, who cannot help but admire the King's ingenuity and audacity but ultimately recognizes their moral cost.

Mister Roberts
Author: Thomas Heggen
First published: 1946

Like Herman Wouk's *The Caine Mutiny* (1951), Heggen's novel has been adapted very successfully for stage and for film. Also like *The Caine Mutiny*, it focuses on the tensions between the captain and the crew, not on a big warship such as a carrier, battleship, or cruiser, but on a support ship. Unlike the destroyer converted to a minesweeper in *The Caine Mutiny*, however, the ship in *Mister Roberts* is a cargo ship operating far from the widely scattered battlefronts of the Pacific theater. The story presents a battle of wits between the well-meaning title character, respected by the crew but yearning for a combat assignment, and the ship's captain, protecting his ship's "clean" record by perversely exerting his authority.

The Naked and the Dead
Author: Norman Mailer
First published: 1948

Mailer's first novel remains the most highly regarded American novel about World War II. Set on a Japanese-held island on which American forces have landed, the novel features a broad range of characters, but the three focal characters are the aristocratic and fascist-leaning General Cummings; his well-born but more egalitarian aide, Lieutenant Hearn; and the battle-hardened but hardly heroic Sergeant Croft. The novel provides ample illustrations of the brutality of combat in the Pacific, as well as manifold evidence of the disjunction between the abstraction of painstakingly developed campaign strategies and the fluid realities of the battlefield. It vividly explores the connections and disjunctions between the characters' civilian lives and their military experiences.

The Painted Bird
Author: Jerzy Kosinski
First published: 1965

In his first and most enduring novel, Kosinski chronicles the experiences of a Jewish-looking young boy who is sent by his parents from a Polish city into the ostensible safety of the countryside. The peasants with whom the boy seeks refuge are typically as anti-Semitic as the Nazis, and his survival is something of a miracle resulting from completely accidental turns in circumstance, the intercession of a few beneficent individuals, and the boy's own increasing store of survival skills. In the end, he is adopted into a Russian military unit and finds a father figure in an accomplished sniper. The novel's closing provides a hopeful note about the boy's capacity to transcend at least some of the trauma of his formative experiences.

Partisans
Author: Alistair MacLean
First published: 1982

Not as well known as *The Guns of Navarone* (1957), *Partisans* also treats the Yugoslavian theater during World War II, but it provides a more nuanced sense of the very complicated range of contending forces in that conflict. Although all Yugoslavian partisan groups are ostensibly resisting the German and Italian occupation of their country, their military strategies and actions are directed as much against each other as against the occupiers. The three main partisan groups are the Communists; the Serbian Chetniks, who support the reinstatement of the Yugoslav monarchy; and the Croatian Ustashe, who have a fascist ideology. MacLean's protagonist is clearly a Nazi hater, but beyond that his allegiances and aims are very ambiguous.

The Polish Officer
Author: Alan Furst
First published: 1995

The third novel in Furst's Night Soldiers series, *The Polish Officer* is set primarily in Poland after the German and Soviet conquest and partition of that nation. The main character, Captain Alexander de Milja, is an expert mapmaker who becomes a pivotal figure in the Polish underground and its attempts to support the Polish government in exile. He takes the lead in concealing Poland's gold reserves from the Nazis and Soviets and in smuggling those reserves through Romania to Great Britain. While emphasizing de Milja's courage and ingenuity, Furst also conveys the physical and psychological strain caused by his clandestine activities and his recurring impulse simply to save himself regardless of the cost.

Run Silent, Run Deep
Author: Edward L. Beach, Jr.
First published: 1955

Drawing on his own extensive service as a submariner during World War II, Beach wrote this novel in the middle of a lengthy and distinguished military career. It presents a vivid depiction of the experiences of American submariners in the Pacific theater during World War II. The central characters are Commander P. J. Richardson and his executive officer, Jim Bledsoe. Richardson is obsessed with sinking the Japanese destroyer that destroyed the submarine he had previously commanded as well as several others, and the crew begins to question his decisions. Bledsoe shifts from second-guessing Richardson to pursuing his objectives after Richardson is accidentally disabled after suffering a fractured skull.

Slaughterhouse-Five
Author: Kurt Vonnegut, Jr.
First published: 1969

With this novel and *Cat's Cradle* (1963), Vonnegut made the dramatic transition from a little-known writer of speculative fiction to one of the leading literary voices of the counterculture period. In *Slaughterhouse-Five*, he startled readers by synthesizing aspects of historical and speculative fiction. The novel includes a lengthy and harrowing account of the American bombing of Dresden, seen through the perspective of American prisoners of war, who were afterward employed in the collection and disposal of the corpses of some of the tens of thousands caught in the firestorm. Like *Catch-22* (1961), this novel about World War II became a major antiwar work of the Vietnam era.

The Soldier
Author: Richard Powell
First published: 1960

Set in the Pacific in the months following the American entry into World War II, this novel focuses on the effects of the war on the career of Lieutenant Colonel William A. Farralon. His assignment to a remote Pacific post serves as an unmistakable indication that his career is on a downturn. However, after the Japanese attack on Pearl Harbor and most of the other American and European bases in the Pacific and Southeast Asia, Farralon takes advantage of a series of opportunities to distinguish himself. By the end of the war, he has risen to the rank of general, and his earlier fall from favor has been permanently eclipsed by his wartime service.

The Thin Red Line
Author: James Jones
First published: 1962

In this loose sequel to *From Here to Eternity* (1951), Jones re-presents the major characters from that novel under similar names. This novel provides a fictional account of the Guadacanal campaign—in particular, the Battle for Hill 53. Jones emphasizes that the sense of unit cohesion provided the individual infantryman's only psychological defense against the isolating terror of hand-to-hand combat in the hellishly tropical environment. In his later nonfiction study of the war and the art that it inspired, Jones contrasts the battle for Guadacanal, the outcome of which depended very much on the efforts of very small groups of Marines, with the corporatization of the war effort at Saipan, Iwo Jima, and Okinawa, the outcomes of which were never in doubt—however much their ultimate cost in blood and matériel may have been miscalculated.

The Tin Drum
Author: Günter Grass
First published: 1959, as *Die Blechtrommel*

The Tin Drum is the first novel in Grass's acclaimed *Danziger Trilogie* (1980; *Danzig Trilogy*, 1987), which also includes *Katz und Maus* (1961; *Cat and Mouse*, 1963) and *Hundejahre* (1963; *Dog Years*, 1965). Although the late revelation of Grass's service with the Waffen-SS has somewhat compromised his standing as a critic of the Nazi regime, *The Tin Drum* remains the most inventive and trenchant critique of that regime yet written. A work of Magical Realism predating the definitive Latin American experiments with that style, *The Tin Drum* is the autobiography of its main character, Oskar Matzerath, who decides not to enter the adult world and remains physically a child even as he ages. His most prized possession is a tin drum, which he protects at all costs and through which he communicates with an increasingly deranged world.

A Town Like Alice
Author: Nevil Shute
First published: 1950

The protagonist of this novel is Jean Paget, an Australian woman who is in Malaya at the time of the Japanese invasion and is detained for the duration of the war with a group of European women and children. During the course of their detainment, they are helped by an Australian prisoner of war who steals food and other supplies that keep them alive and then accepts the punishment for those actions without implicating them. That punishment is so severe that Jean mistakenly assumes that he has not survived the war. The rest of the novel describes the convoluted process by which they are eventually reunited and the terms on which they decide to build a life for themselves in a rural Queensland community.

V-Letter and Other Poems
Author: Karl Shapiro
First published: 1944

Although Shapiro had a long and distinguished career, his literary reputation has faded to the point that it would come as a surprise to most students of modern American poetry that at the end of World War II he was widely regarded as one of the most accomplished and promising poets of his generation. Awarded a Pulitzer Prize, this collection was written while Shapiro was serving with the U.S. Army in the New Guinea campaign. Imitating the style and form of the letters that military personnel sent to their loved ones back home, the poems convey both the immediacy and the terrible strangeness of the war's horrors. Likewise, they suggest the soldiers' growing sense of disconnection from home and their increasingly desperate need to maintain some sense of connection to life beyond the war.

The War Lover
Author: John Hersey
First published: 1959

Hersey's novel chronicles twenty-three bombing raids by a B-27 crew over German targets during World War II. It focuses on one bomber pilot who is either admired or reviled by his fellow pilots, their

crews, and his superior officers. Although he repeatedly exhibits great skill and daring, his need continually to push the limits becomes increasingly regarded as recklessness and dangerous self-indulgence, especially since others seem to pay for the chances he takes while he survives unscathed. Critics of the novel have praised Hersey's attention to technical and sociological detail, but they have also suggested that the density of detail is detrimental to the literary value of the novel.

War of the Rats
Author: David L. Robbins
First published: 1999

One of the few noteworthy American novels about the eastern front of World War II, *War of the Rats* depicts the titanic battle for Stalingrad in all of its terrible scope and ghastly particulars. The city had quickly been reduced to rubble, and soldiers on both sides were fed into prolonged battles for individual city blocks and even individual buildings. Despite the firepower of the masses of mechanized weapons employed in the battle, the fighting was largely hand-to-hand and medieval in its ferocity. The novel provides a microcosm of the battle through the contest of skill and wits played out between the most celebrated German and Soviet snipers.

Williwaw
Author: Gore Vidal
First published: 1946

This novel is notable because it is the debut effort of a long, prolific, and distinguished literary career, because it was regarded as the first "literary" novel about World War II to be published, and because it is the only significant novel to treat the Aleutian theater of the war. Vidal wrote the novel while serving with the Navy on a supply ship. The title refers to a strong wind that blows down from the snow-covered coastal mountain peaks and collides with the warm air rising up from the sea, creating violent storms and currents. Given that the war in the Aleutians claimed far fewer lives than the weather, among all branches of the military, it is important that Vidal's novel is meteorologically as well as psychologically accurate.

The Winds of War
Author: Herman Wouk
First published: 1971

This immensely popular novel and its sequel, *War and Remembrance* (1988), are each nearly a thousand pages long, reflecting Wouk's ambition to capture the whole scope of World War II as powerfully as he had captured it in microcosm in *The Caine Mutiny* (1951) two decades earlier. The novel is unified by being presented through the eyes of the widely scattered members of a single family, that of Victor "Pug" Henry, a naval officer who becomes a sort of personal emissary of and troubleshooter for President Franklin D. Roosevelt. This strategy no doubt increased the popularity of the novels, but for critics, it stretched credibility and made many aspects of the novel seem contrived, despite Wouk's obvious efforts to ensure historical accuracy.

The Young Lions
Author: Irwin Shaw
First published: 1948

Of all of the acclaimed American novels about World War II, Shaw's *The Young Lions* has perhaps suffered the most precipitous decline in critical appreciation. Shaw was a real pro as a novelist, and his manipulation of the conventions of the realistic novel make some of his late novels a delight to read. This novel is perhaps a little too obviously "well made" in its presentation of the intersecting stories of three soldiers: a self-indulgent but charming product of privilege named Michael Whiteacre, a working-class Jew named Noah Ackerman, and a German officer named Christian Diestl.

COLD WAR

The Manchurian Candidate
Author: Richard Condon
First published: 1959

Condon has been described as one of the most paranoid novelists ever. Certainly this landmark novel of the Cold War captured the profound distrust on both sides of the conflict. The novel begins with

the capture of a platoon of American soldiers by the Chinese during the Korean War. The soldiers are brainwashed into believing that Sergeant Raymond Shaw, an unlikely hero, has saved them from being massacred. Shaw receives the Medal of Honor, but after they all return to the United States, his captain, Bennett Marco, gradually uncovers the truth that Shaw has been programmed to perform a political assassination.

Once an Eagle
Author: Anton Myrer
First published: 1968

Although not highly regarded by literary critics, Meyer's best-known novel is one of only two works of fiction on the recommended reading list for the U.S. Army's Officer Professional Development program. The novel follows the careers of two officers over three decades, from World War I to the beginnings of the Cold War in the years immediately following World War II. The two officers are very different in temperament and mores. Sam Damon is an upright person in both his personal and his professional relationships; in contrast, Courtney Massengale is a much more Machiavellian character who has very little sense of personal loyalty. The novel provides an intimately knowledgeable account of how the military bureaucracy operates.

The Red Wheel
Author: Alexsander Solzhenitsyn
First published: 1983-1991, as *Krasnoe koleso*: includes *Avgust chetyrnadtsatogo*, 1971, expanded 1983 (*August 1914*, 1972, expanded 1989); *Oktiabr' shestnadtsatogo*, 1984 (*November 1916*, 1999); *Mart semnadtsatogo*, 1986-1988 (partial translation as *March 1917*, 2006); *Aprel' semnadtsatogo*, 1991 (partial translation as *April 1917*, 2006)

Solzhenitsyn will be most remembered for his two works about the Stalinist penal camps, *Odin den' Ivana Denisovicha* (1962; *One Day in the Life of Ivan Denisovich*, 1963) and *Arkhipelag GULag, 1918-1956: Opyt khudozhestvennogo issledovaniya* (1973-1975; *The Gulag Archipelago*, 1974-1978). However, *The Red Wheel*, his cycle of novels covering the years from the Russian entry into World War I to the collapse of the Russian monarchy in 1917, is a massive work of literary as well as historical merit. *The Red Wheel* includes *August 1914*, *November 1916*, *March 1917*, and *April 1917*, with the middle novels consisting of two volumes each. Solzhenitsyn had originally planned to carry the series through 1922, or the Bolsheviks' consolidation of power at the end of the civil war and Lenin's personal decline due to a series of strokes.

Smiley's People
Author: John le Carré
First published: 1980

This is the third novel in le Carré's Karla Trilogy, which also includes *Tinker, Tailor, Soldier, Spy* (1974) and *The Honourable Schoolboy* (1977). All three focus on British intelligence agent George Smiley and provide a perspective on Cold War espionage dramatically different from the glamorous, high-adventure doings in Ian Fleming's James Bond series. If le Carré is the master of the Cold War novel of intrigue, then this portrait of a career spy who is not permitted to settle quietly into retirement is his masterwork. Although Smiley maneuvers in a world in which violence is a very real and ugly hazard, the emphasis is on his experienced understanding of the subtle surface indications that some clandestine scheme is being orchestrated.

Arab-Israeli Conflicts

Exodus
Author: Leon Uris
First published: 1958

A novel with epic sweep, *Exodus* depicts the violence that preceded and followed the declaration of a Jewish state in Palestine. It begins with the efforts of Jewish underground groups to smuggle refugees and weapons into Palestine in anticipation of independence, and their violence against the British forces that had been garrisoned in Palestine to prevent the Jews and Arabs from prematurely intensifying their inevitable conflict. Criticized for its consistent char-

acterization of the Jews as courageous and its general demonization of the Arabs, the novel presents its Jewish protagonist, Ari Ben Canaan, as a very human but undeniably representative figure.

KOREAN WAR

The Bridges at Toko-Ri
Author: James Michener
First published: 1953

The Bridges at Toko-Ri focuses on the experiences of carrier pilot Harry Brubaker. Having survived much air combat during World War II, Brubaker had just begun to settle comfortably back into civilian life when he was recalled to service in the Korean War. By the time that the mission to destroy the heavily defended bridges at Toko-Ri is announced, Brubaker is suffering from combat fatigue and has become haunted by the foreboding that he will not survive many more missions. Although he manages to destroy the last of the bridges, his plane goes down and he is killed by the Chinese infantry who have shot down the helicopter sent to rescue him.

The Hunters
Author: James Salter
First published: 1957

Like James Michener's *The Bridges at Toko-Ri*, Salter's first novel focuses on the air war over Korea, but Salter is much more interested than Michener in the way a fighter wing functions—in how the fighter pilots compete for recognition and their alliances and conflicts shape how they are led and how long they manage to survive. Despite the complex tactics on which each wing is trained and despite each pilot's dependence in combat on the wingman with whom he is paired, flying fighters is ultimately a solitary test of the pilot's skill, courage, endurance, and temperament. Salter's protagonist, Cleve Connell, eventually downs a notorious MiG pilot known as "Casey Jones" but cannot provide confirmation of the "kill" and so attributes it to his own downed wingman.

M*A*S*H
Author: Richard Hooker
First published: 1968

Published at the height of the Vietnam War, adapted for an experimental film directed by Robert Altman, and providing the basis for one of the longest-running and most acclaimed television series of all time, this novel was based on Hornberger's experiences as a battlefield surgeon during the Korean War and was actually more an irreverent take on military life than a pointedly antiwar work. Following on the success of the film and television series, however, Hornberger—using the pseudonym Richard Hooker—wrote two sequels in 1972 and 1977, and collaborated with William E. Butterworth on a series of twelve novels, published between 1974 and 1977, that followed the mobile army surgical hospital (MASH) surgeons to the far corners of the world.

War Trash
Author: Ha Jin
First published: 2004

Ha Jin's highly regarded novel treats the Korean War from the Chinese perspective. The novel is framed as the memoir of its protagonist, Yu Yuan. Drafted into the Chinese army after the Communist takeover of China, he finds himself among the hundreds of thousands of troops sent across the Yalu River to drive back the United Nations forces that had routed the North Koreans. In addition to relating Yu's experiences on the march and in battle during a bitterly cold winter, the novel treats his eventual capture by U.N. forces and his extended detention as a prisoner of war.

COLONIAL WARS

The Dogs of War
Author: Frederick Forsyth
First published: 1974

The discovery of significant plutonium deposits in a small African nation governed by a dictatorial regime leads a British industrialist to underwrite a mercenary force to remove the existing government and

to replace it with one more disposed to sell the mineral rights under favorable terms. The novel details the ways in which the mercenary force is recruited, given some cohesion as a unit, equipped and supplied, and clandestinely transported to the target nation. The novel is purportedly based on Forsyth's own failed attempt to use a mercenary force to seize the small nation of Equatorial Guinea and to offer it as a haven for the Nigerian insurgents defeated in the Biafran War.

The Four Feathers
Author: A. E. W. Mason
First published: 1902

Following the Mahdi's conquest of Khartoum and the death of "Chinese Gordon," the British forces massed in Egypt under Lord Kitchener to defeat the Mahdi's forces, who were driven equally by religious fervor and anticolonial resentments. The protagonist of this novel resigns from his unit as it is about to be shipped overseas and is justifiably reviled for his cowardice. Seeking to redeem himself, he travels on his own to the Sudan, where, in order to pass himself off as a native, he disfigures himself, infiltrates the Mahdi's forces, and provides critical assistance to his former comrades in arms.

Guerrillas
Author: V. S. Naipaul
First published: 1975

One of Naipaul's most unsparing, harrowing novels, *Guerrillas* concerns an uprising against the continuing colonial influence on a Caribbean island. The three main characters are Roche, a South African exile with progressive political views; his disaffected lover, an Englishwoman named Jane, who mistakes her own world-weariness for depth of understanding and reliable judgment; and Jimmy, a political radical who disdains Roche and Jane but is willing to use them, and anyone and anything available to him, to promote his cause and his own movement toward the centers of power. The novel explores the ease with which the comfortable certainties of daily life can be undermined.

Cuban Revolution

The Death of Che Guevara
Author: Jay Cantor
First published: 1983

In this very ambitious first novel, Cantor has sought to re-create fictionally the life of the Cuban revolutionary, Che Guevara, who has become an increasingly iconic figure since his pointless death while attempting to breathe life into a listless Bolivian insurgency in 1967. Cantor constructs the story around a broad range of historical documents, from personal diaries and correspondence to news accounts and government reports. Almost all of these documents, however, are Cantor's fictional creations, and taken together, they add layers of complexity and possibility to the portrait that the novel provides of this personally and culturally enigmatic figure.

Vietnam War

Dispatches
Author: Michael Herr
First published: 1977

This book, a seminal work of the New Journalism, was published a decade after Herr traveled to South Vietnam to report on the Vietnam War for *Esquire*. The essays that he produced for that magazine as well as for *Rolling Stone*, *New American Review*, *New York*, and *Crawdaddy* were revised extensively and synthesized into the continuing narrative of the book. Nonetheless, that narrative consists largely of vignettes that convey, often with ironic or horrific immediacy, the "grunt's" view of the war. The power of the narrative derives from Herr's identification with the average soldier and his recognition that however close he comes to the fighting, he is more a witness than a combatant.

Going After Cacciato
Author: Tim O'Brien
First published: 1978, revised 1989

The most acclaimed American novel about the Vietnam War, *Going After Cacciato* combines the documentary realism of O'Brien's other books about the war with an extended episode of Magical Realism. The novel is divided into three types of chapters. The narrative is organized around ten "Observation Post" sections, set in November, 1968. In these sections, the main character, Paul Berlin, reflects on the ironies, paradoxes, improbabilities, and hard realities of the war. These sections also provide a narrative frame for the other two types of sections: his memories of his unit's harrowing experiences in combat between June and October and an extended fantasy about his unit's pursuit across two continents of the AWOL soldier Cacciato.

Meditations in Green
Author: Stephen Wright
First published: 1983

In this, his first novel, Wright presents the recollections of a veteran of the Vietnam War who is attempting, through meditation exercises in which he focuses on plants, to recover some sense of emotional and moral equilibrium. His recollections of the war include characterizations of officers too self-centered to inspire confidence in their leadership and of soldiers too young to cope with the alternating boredom and terror of war without using mind-altering drugs or retreating into varying degrees of psychotic detachment. The focal event involves an effort to locate and recover the remains of an intelligence patrol crew presumed lost when their helicopter went down. The bodies are found gruesomely mutilated and displayed.

No Man's Land
Author: Duong Thu Huong
First published: 2005

Perhaps the most internationally known Vietnamese dissident writer, Duong Thu Huong supported the North Vietnamese and Viet Cong cause during the Vietnam War. Following the reunification of the country, however, she became a critic of the abuses of power and the corruption that she felt had become endemic within the communist regime. Though not pointedly political, her once popular novels were banned, and she was imprisoned several times. In *No Man's Land*, a missing-in-action North Vietnamese soldier returns home fourteen years after the end of the war. Although he has been physically and psychologically damaged by his wartime experiences, which are presented in flashback, his wife is pressured into leaving her current husband and their son, both of whom she loves dearly, and to endure the privations and humiliations of life with him.

Paco's Story
Author: Larry Heinemann
First published: 1986

When this, Heinemann's second novel, won the National Book Award, it was generally regarded as a very surprising choice. Like Heinemann's first novel, which had been published nine years earlier, *Paco's Story* concerns the experience of a Vietnam veteran. The title character is seeking a respite in which he can recuperate physically and psychologically from his wartime experiences. Although he finds a job washing dishes in a small-town restaurant operated by a sympathetic veteran of World War II, he cannot escape the stigma of having served in an unpopular war or the memories of the atrocities that he and his fellow soldiers committed in Vietnam. Much of the novel is narrated by the ghosts of the men in Paco's unit who died in Vietnam.

The Quiet American
Author: Graham Greene
First published: 1955

A truism about the Vietnam War has been that American involvement dated from the defeat of the French at Dien Bien Phu. In actuality, the United States supplied almost all of the military matériel used by the French against the Viet Minh, and American concern with checking Soviet influence, more than any American interest in preserving pre-World

War II European empires, drove U.S. involvement in Vietnam from its clandestine beginnings. Narrated by Thomas Fowler, a world-weary British journalist, Greene's novel explores the enigmatic character of Alden Pyle. Nominally an American aid worker, Pyle is clearly working for the Central Intelligence Agency to ensure that a South Vietnamese alternative to the Viet Minh will be available if the French do not prevail in the largely guerrilla war against them. Pyle is murdered, but not before he gets Fowler's beautiful Vietnamese mistress.

The Sorrow of War
Author: Bao Ninh
First published: 1993

Framed as a novel within a novel, *The Sorrow of War* presents a "fictional" account of the wartime experiences of Kien, a North Vietnamese veteran of the Vietnam War. The survival of any long-serving veteran of that prolonged conflict would be something of a miracle, but in several instances, Kien has been the only survivor of firefights, shellings, and bombings that have killed every other member of his unit. His extraordinary luck is, however, juxtaposed to the loss of his lover, whom he has known since their idyllic childhood, and the unreliability of others whom he has trusted.

Tree of Smoke
Author: Denis Johnson
First published: 2007

A recipient of the National Book Award, Johnson's novel seems a high mark in a steadily distinguished, if idiosyncratic, literary career. Certainly, *Tree of Smoke* stands out in a body of work consisting of very spare novels on eccentric subjects. It is a long and lushly descriptive fictional treatment of the Vietnam War. The main character is Skip Sands, an agent with the Central Intelligence Agency who serves in Vietnam from 1965 to 1970, or from the dramatic escalation of American involvement to the post-Tet Offensive recognition that deescalation, if not defeat, was inevitable.

First Gulf War

We Pierce
Author: Andrew Huebner
First published: 2003

The most significant literary work written about the Gulf War of the early 1990's, *We Pierce* is a fictionalized memoir or autobiographical novel drawn from Huebner's own family history. The narrative focuses on two brothers, Sam and Smith Huebner. Sam is politically progressive, a teacher and writer whose emotional demons are exhibited in his deepening alcohol and drug abuse. Forgiving to a fault in terms of family issues, Sam paradoxically is very dogmatic in his political views, including his opposition to the Gulf War. In contrast, Smith serves with distinction as part of a tank crew during the conflict. Although he refuses to address the issues in their parents' marriage and their upbringing, he has a contented marriage and does everything that he can to ensure that his own children's home life is stable.

African Civil Wars

Johnny Mad Dog
Author: Emmanuel Boundzéki Dongala
First published: 2005

Dongala explores the world of the "boy soldiers" who have become commonplace among the combatants in Africa's civil wars because they are one of the largest segments of most African populations, because they are more easily indoctrinated than adult "recruits," and because they can be more easily conditioned to witnessing and committing atrocities. The novel is drawn from Dongala's experiences during the Republic of the Congo's civil war in the late 1990's. The title character has became a despicable, sociopathic character, and Dongala emphasizes how little he and his kind feel any connection to their country, its people, or its future.

The Rebels' Hour
Author: Lieve Joris
First published: 2008

Published variously as a nonfiction novel and as a work of creative nonfiction, Dutch journalist Joris's book resulted from extensive reporting on and a complex understanding of the conflicts of central Africa and, in particular, the Democratic Republic of the Congo—previously referred to as Zaire, the Belgian Congo, and the Congo Free State. The focal character is a Tutsi named Assani. Originally from Rwanda, his family fled from the Hutu genocide into the eastern Congo, where the ethnic conflicts in Rwanda and Burundi became intertwined with an equally vicious cycle of civil war. Assani was recruited by Lawrence Kabila, whose largely Tutu force overthrew the infamously corrupt and pro-Hutu Mobuta regime, shortly before Kabila himself was assassinated.

AFGHAN WARS

The Kite Runner
Author: Khaled Hosseini
First published: 2003

The story of the unlikely friendship of two boys in Afghanistan—one rich and one poor—is set against the backdrop of Afghanistan from the end of the monarchy through the wars of the present.

Martin Kich

Lexicon

Abteilung. German term for a detachment or battalion in either the German (later West German or East German) or Swiss armed forces. During World War II (1939-1945), an Abteilung was generally for a unit of about 1,000 soldiers and was used in the Waffen-SS and other groups.

Aircraft carrier. A large, motorized warship with a flat topdeck to serve as a runway for fixed-wing aircraft. Invented by the British in 1918, developed by most major navies in the 1920's and 1930's, and first used in World War II (1939-1945), its effectiveness was dramatically proved at Pearl Harbor in December of 1941, and then the Battle of Midway, in June of 1942, when planes from three American carriers, *Enterprise*, *Hornet*, and *Yorktown*, commanded by Admiral Raymond A. Spruance, destroyed four Japanese carriers, *Akagi*, *Hiryu*, *Kaga*, and *Soryu*, commanded by Admiral Isoruku Yamamoto. The carrier immediately superseded the battleship as the primary instrument of naval firepower.

Amabutho. This term is often used interchangeably with "regiment" for Zulu armies. The number of warriors in this unit ranged from 900 to 4,000.

Antiaircraft gun. A machine gun, often with two or more barrels for wide-pattern fire; pedestal-mounted with rapid 360-degree traverse in fixed batteries, land vehicles, or ships; designed for accurate, long-range, high-angle fire to shoot down enemy aircraft. Developed late in World War I (1914-1918) and popularly known as "ack-ack" (both from its sound and from British signalmen's variant pronunciation of its acronym, AA), it was a standard weapon in World War II (1939-1945) but was superseded by guided antiaircraft missiles in the late twentieth century.

Antiballistic missile (ABM). Developed by the United States in the late 1950's and widely deployed by both the United States and the Soviet Union by the 1970's, any guided missile, either ground-launched, sea-launched, or air-launched, with a nuclear warhead designed to explode in the vicinity of incoming enemy missiles, rendering them harmless. ABM systems were supposed to be severely limited as a provision of the 1972 Strategic Arms Limitation Talks (SALT I), but verification proved difficult.

Antimissile missile. Any missile intended to destroy an incoming enemy missile before it can do any damage. Satellite-guided antimissile missile systems were a fundamental component of President Ronald Reagan's Strategic Defense Initiative (SDI), known as "Star Wars," in 1983, but their technology was still not practical decades later. Antiballistic missiles are a special type of antimissile missile.

Antitank gun. A rifled firearm specifically designed to destroy tanks. The earliest, in 1918, was the German 13.3-millimeter Mauser Tankgewehr bolt-action rifle, firing armor-piercing bullets. By World War II (1939-1945), antitank weaponry was recognized as very important. Most were field pieces, such as the German 37-millimeter Panzerabwehrkanone (PAK36) and the Soviet 100-millimeter M-1944, all firing armor-piercing shells. After World War II, recoilless guns, mortars, and rocket launchers firing guided armor-piercing missiles replaced antitank guns.

Arbalest. Originally, after about the eleventh century, the French word for crossbow, derived from two Latin words, *arcus*, or bow, and *ballista*, or big, rock-shooting crossbow. Around 1400, the term also began to mean a particular type of large, very powerful, heavy-draw Northern European crossbow, whose bow was shorter than average and either reinforced with steel or made entirely of steel.

Arban. The smallest unit in the Mongol army, consisting of 10 soldiers.

Armor-piercing shell. Special antitank or antiship artillery ammunition, in two varieties: kinetic and chemical. The former is a hard, high-velocity,

usually pointed shell that punctures the armor and then explodes inside the target; the latter is designed to explode either near or on the armor, shattering it from the outside. Development of armor-piercing ammunition was necessitated by the introduction of ironclad warships in the American Civil War (1861-1865) and tanks in World War I (1914-1918).

Army. A general term to describe the land force of the defense forces of any country. In the Byzantine Empire, an army consisted of 9,000 soldiers (or three *meroi*). In the British army, specifically, "army" refers to a land formation that consists of more than one corps. In the latter case, the armies are given numerical prefixes, such as First Army and Second Army.

Army group. A land-force formation that includes two or more numbered armies. An example of an army group occurred during the German invasion of the Soviet Union in 1941; army groups were given geographical descriptors: Army Group South, Army Group North, and so on. Army Group Africa consisted of Italian and German soldiers. In all these cases, army groups were commanded by a field marshal. The Japanese army in World War II (1939-1945) was divided into six army groups; and during the Sino-Japanese War (1937-1945) and the Chinese Civil War (1946-1949), there were also army groups, which might have anywhere between 500,000 and 1.5 million soldiers. After World War II, armies of the North Atlantic Treaty Organization (NATO) were formed into army groups combining soldiers from a variety of allied countries.

Artillery. Sometimes called ordnance, the term comprises all firearms, or weapons powered by explosions, that must be operated by more than one soldier for maximum effectiveness, such as cannons, most rockets, and most missiles, as well as some pre-gunpowder heavy siege weapons such as catapults, onagers, trebuchets, and large varieties of the crossbow. Artillery is traditionally classified as either heavy or light.

Assagai. A short-handled, long-bladed, double-edged traditional spear of the Zulu nation of South Africa. Used mainly as a multiple thrusting weapon, it could also be hurled as a javelin or wielded for slashing. It fit well into the standard "chest-and-horns" assault and surround tactics of the Zulu, in which a large body of troops in close ranks would run suddenly at the enemy to gain advantage in hand-to-hand combat, as they did when they destroyed the British at Isandhlwana in 1879.

Assault helicopter. A versatile fighting aircraft developed by the United States in the 1950's, first used extensively in the Vietnam War (1961-1975) and refined by the Soviet Union in the 1970's. The mainstay of modern air cavalry, its tactical equipment includes computerized search-and-destroy weapons, antitank guns, machine guns, rockets, air-launched minelaying systems, and sophisticated navigation devices for rapid, ground-hugging flight. Among the most prominent types are the Soviet Mi-24 and Mi-28 and the American Apache and Black Hawk.

Assault rifle. Fully automatic rifle that can fire either single-shot or rapid fire, developed by many nations during World War II (1939-1945) but primarily by Mikhail Kalashnikov (b. 1919) for the Soviet Union between 1941 and 1944. His AK-47, named for the year of its invention, is the most famous weapon of this type. Others include the Israeli Uzi and the American M-16. Most models have a straight stock to prevent the recoil from pushing successive shots gradually too high during rapid fire.

Atomic bomb (A-bomb). An extremely powerful explosive device involving the fission of radioactive elements, invented during World War II (1939-1945) by an American team of scientists in fulfillment of the secret, federally funded Manhattan Project. It was first tested on July 16, 1945, at Alamogordo, New Mexico; first used on August 6, 1945, when the United States dropped Little Boy, a uranium bomb, on Hiroshima, Japan; and used for the second and last time in the twentieth century on August 9, 1945, when the United States dropped Fat Man, a plutonium bomb, on Nagasaki, Japan.

Automatic firearm. Any firearm that loads automatically, usually from either a bandolier belt or a magazine, and fires more than one shot for each

squeeze of the trigger. The reloading process is typically powered by the energy from each previous shot, as hot gas, recoil, or blowback. The first sustained use of automatics in warfare was as the various Browning, Maxim, Spandau, and Vickers heavy machine guns that caused millions of casualties in World War I (1914-1918).

Ballista. A gigantic crossbow used in both ancient and medieval warfare, developed by the Romans but patterned after the mounted crossbows invented by Archimedes. Tactically employed as a catapult, it was cocked with a winch and ratchet, usually wheeled, and capable of hurling bolts or stones of up to about 10 pounds (4.5 kilograms) accurately for relatively long distances (about 400 yards or meters) at tolerably low trajectory.

Ballistic missile. A large, long-range guided missile, usually with a nuclear warhead, developed by the United States in the late 1950's, self-propelled by a rocket engine on a high-trajectory, often stratospheric, course, and guided in its upward arc but usually free-falling in its descent. Its earliest prototype was the Nazi VZ (Vergeltungswaffe Zwei) rocket, used with a high explosive warhead against London from September, 1944, to March, 1945.

Ballistite. Smokeless powder introduced in 1887 by Alfred B. Nobel (1833-1896) and consisting of 40 percent low-nitrogen nitrocellulose and 60 percent nitroglycerin. The product could be manufactured as small flakes and was a common propellant for firearms until after World War II (1939-1945). In the English-speaking world, cordite, a similar mixture invented shortly after ballistite, was more common.

Band. This term, often referring to warrior bands, was used to describe the many Native American military units during the nineteenth century.

Bangalore torpedo. An indefinitely long metal tube, consisting of a series of short lengths screwed together, with an explosive charge at one end and a fuse inside the tube. By pushing it slowly toward or under its target, demolition teams could remain in positions of cover and cut paths through barbed wire, neutralize minefields, or blast fortifications. The Allies, notably the amphibious forces on D day, used it extensively during World War II (1939-1945).

Banner. A unit within the Manchu army, the vast majority originally mounted, who would follow a particular banner in battle; altogether there were eight banners. During the Qing (Ch'ing) Dynasty in China (1644-1912), it came to represent a military unit within the Chinese army consisting of thousands of soldiers, almost exclusively of Manchu descent. Manchu soldiers came to be known as bannermen.

Barbed wire. Thick wire with sharp metal points built in at regular intervals, first patented in the United States in 1867, first used for civilian purposes to mark boundaries, and extensively deployed as a defensive obstacle in both world wars. Since the late twentieth century, varieties have been manufactured with embedded fiber-optic cable so that computerized sentry systems can determine precisely where the enemy breaches it and immediately direct defensive fire to that spot.

Barrage balloons. Defensive antiaircraft apparatus used in both world wars, especially by the British. Small balloons trailing long cables or nets were tethered at high altitude in the hope that enemy aircraft attacking below the balloons would catch their wings on the dangling obstacles.

Baselard (*or* basilard). A double-edged European dagger common from the fourteenth to the sixteenth centuries, typified by two prominent crosspieces, one at the pommel, or the end of the hilt, the other at the guard, or the joint between the hilt and the blade.

Battalion. An infantry unit that is commanded, in the case of the U.S. and British armies, by a lieutenant colonel. Within the British army, over time, its size has changed considerably. Traditionally at full strength it was similar to that of a Roman legion, around 1,000 soldiers. In the Australian army in World War I (1914-1918), it had, at full strength, about 1,000 soldiers. For the German army in World War I, battalions were subdivisions of regiments, usually with three battalions in a regiment, numbered I, II, and III. Overall, a German battalion had, at full strength, 23 officers,

3 regimental medical officers and paymasters, and 1,050 other ranks. By 1917, because of the shortage of soldiers, most battalions had about 750 soldiers in them. In the U.S. Army, battalions can have as little as three companies (300 soldiers) or as many as 1,200 soldiers.

Battering ram. An ancient and medieval siege engine for breaching enemy walls, consisting of a large pole, usually a tree trunk, with a metal head, sometimes pointed, slung horizontally from ropes under a sturdy frame so that it could be swung back and forth with great force. The frame, covered with water-soaked hides to prevent defenders from burning it, could be wheeled up to the target wall by soldiers underneath it, chocked, and put to work.

Battery. A unit of artillery, commanded by a major. To some degree the equivalent of a company of infantry or a squadron of cavalry.

Battle-ax. A slicing and chopping weapon invented in the Stone Age when someone lashed a sharp stone to the end of a stick, developed throughout the Bronze Age, and nearly perfected during the Iron Age, when more sophisticated versions evolved from both the mace and the hand ax. Although warriors needed great strength to wield it well, it proved popular in all pre-firearm cultures, especially in the eighth to eleventh centuries among the Vikings, who revered their axes and often gave them proper names, such as Skarphedin's gigantic Rímmugýgr, or "Ogress of War," in *Njal's Saga*.

Battleship. A gigantic, armored, motorized ship bristling with long-range, large-caliber, breech-loading cannon, mounted mostly in turrets, intended primarily for ship-to-ship combat. It dominated naval warfare from the late nineteenth century until the aircraft carrier was proved superior at Midway in 1942. Before 1906 it was relatively slow, with the intermediate battery larger than the main battery, but thereafter the standard was the dreadnought, faster, larger, more heavily armed and armored, and with its strength disproportionately concentrated in the main battery.

Bayonet. An edged weapon attached to the muzzle of a firearm, usually a musket or rifle, first used in Europe in the seventeenth century to substitute for a pike. The earliest, the plug bayonet, was inserted into the muzzle itself. The socket bayonet includes a sleeve to fit over the muzzle; the sword bayonet has a regular sword hilt with an adapter slot that slides under the barrel; and the integral bayonet is permanently affixed to the firearm. Bayonet tactics evolved into complex and deadly offensive maneuvers in the eighteenth and nineteenth centuries. Since the twentieth century, bayonets have mostly been multipurpose survival knives conveniently detachable from a soldier's personal weapon.

Bazooka. An American recoilless antitank weapon, the M9A1, common in World War II (1939-1945). A short-range, handheld, direct-fire, line-of-sight weapon firing unguided projectiles, it was superseded after the war by more sophisticated recoilless guns and especially by mortars firing guided antitank missiles.

Big Bertha. Any of several large German howitzers mounted on railway cars and used extensively in World War I (1914-1918) on the western front until 1916, when the newer Allied heavy artillery outranged them. The designation especially refers to the Krupp 42-centimeter L-14, because Gustav Krupp's wife's name was Bertha.

Bilbo. A high-quality, wide-bladed, double-edged, fancy Spanish rapier of the Renaissance, so called from the place of its manufacture, Bilbao, Spain.

Bill. Type of pole arm whose head includes a regular spear point, a hook for unhorsing mounted knights or cavalrymen, and numerous perpendicular spikes. One of the first pole arms, it evolved from the pruning hook, or billhook, and was in use from the early Middle Ages until the end of the eighteenth century. Many variants exist, some resembling the voulge, with a small ax-blade instead of the spikes, but the required feature is the hook.

Biological weapons. Organic substances introduced into enemy areas by bombing, artillery, or infiltration, designed to cause debilitating disease outbreaks. Sometimes, but not quite accurately, known as germ warfare, the employment of such weapons includes loading medieval trebuchets with dead horses, tampering with water supplies,

and releasing noxious aerosol particles in enemy airspace. Among the diseases that could be caused by these tactics are cholera, influenza, anthrax, typhoid, dysentery, encephalitis, malaria, typhus, yellow fever, bubonic plague, and smallpox.

Bireme. A galley with two banks of oars. Shortly after the naval ram was invented, around 800 B.C.E., the Greeks and Phoenicians developed fast galleys to exploit this weapon. More oarsmen meant more speed and power, but, since single-banked ships long enough to hold crews of more than 50 were impractical, the bireme was developed around 700 B.C.E., with an upper bank of oars on outrigger fulcrums so as not to interfere with the lower bank. It was between 25 and 35 meters long, carried a crew of about 100, and reached top oared speeds between 7 and 9 knots per hour.

Blockbuster. A popular name for the high-capacity bomb, the giant aerial bomb dropped by both the Allies and the Germans in World War II (1939-1945), so called because each one was capable of demolishing an entire city block. Developed first and best by the British, the largest could hold 22,000 pounds (10,000 kilograms) of TNT (trinitrotoluene), RDX (cyclo-1,3,5-trimethylene-2,4,6-trinitramine), PETN (pentaerythitol tetranitrate), or some combination of these explosives.

Blowgun. A long, straight, thin, smallbore, hollow tube through which light projectiles, usually darts, are driven with amazing accuracy to surprising distances, solely by the force of rapidly but smoothly exhaled breath. Independently developed by many preliterate tropical cultures, such as those of Malaysia, Indonesia, and Brazil, its darts are sometimes poisoned, and a flared mouthpiece is often added to concentrate the breath for more power.

Blunderbuss. A short-range, short-barreled, muzzle-loading, smoothbore, personal firearm developed in either Holland or England early in the seventeenth century and common through the eighteenth, characterized by a flaring muzzle to facilitate loading and to scatter the shot, which could be either a single bullet or a pellet load. Extremely inaccurate, with the effect of a sawed-off shotgun or scattergun, it was typically used as a defensive or deterrent weapon for property owners, ships' officers, and stagecoach drivers.

Bofors gun. A type of light, mobile, antiaircraft gun, usually 40 millimeters, intended for use especially against low-flying planes, and named after the Swedish company that introduced it in the 1930's. Naval varieties are typically mounted with double, quadruple, sextuple, or octuple barrels.

Bolt-action rifle. Any breech-loading rifle that uses the manual action of a sliding bolt to open the breech block and eject the spent cartridge. The bolt handle is pushed up out of a slot to unlock the breech and down into the slot to lock it. The weapon can be either repeating, if it can take a magazine, or single-shot, if it cannot. Typically, the repeaters have military application, while single-shot bolt-actions are for sport. Developed in the 1860's and 1870's, bolt-action weapons were the norm in the Second Boer War (1899-1902) and World War I (1914-1918).

Bomb. Any offensive explosive device designed to detonate only under certain conditions, but especially, since World War I (1914-1918), one dropped from an airplane, thrown, or otherwise delivered aerially, but not by artillery.

Bombard. A primitive smoothbore mortar, probably dating from the early fifteenth century, characterized by a narrow powder chamber; an extremely short, sometimes flaring, barrel; and a huge-caliber bore, sometimes as wide or wider than its length.

Bomber. An aircraft designed to drop explosive devices accurately on target. The first bombers were observation planes dropping handheld bombs early in World War I (1914-1918). By the end of that war, both sides had specialized planes for bombing missions, particularly the British DeHavilland and the German Gotha. The Spanish Civil War (1936-1939) and World War II (1939-1945) were the first wars in which airpower played a dominant role, and during their courses, aerial bombing became a carefully studied science.

Booby trap. An offensive obstacle designed to kill, maim, or terrorize unsuspecting soldiers or passersby. Extensively used by the Viet Cong against the Americans in Vietnam, by native populations

against invading forces, by fortress defenders, and by terrorists, the wide variety of booby traps includes car bombs, mines, mail bombs, pitfalls, nets, tripwires, spikes, spring traps, snares, positioned firearms, and time bombs.

Boomerang. An aboriginal Australian, aerodynamically enhanced throwing stick, designed in two basic forms: one flying a curved path and returning to the thrower, and the other flying a straight, far, end-over-end path but not returning. The former is used mainly for hunting and exhibitions, the latter for war. War boomerangs exist in many styles but are generally heavier and may have cutting edges or protuberances. Some throwing sticks, similar to boomerangs, were found in the tomb of the Egyptian Pharaoh Tutankhamen.

Bouncing bomb. This device, created by the British inventor Barnes Wallis, was designed to penetrate the defenses of the German dams in World War II (1939-1945). The idea came to Wallis when he watched a boy skimming a stone at a village pond; he used it effectively in the dam-buster raids Operation Chastise in May, 1943.

Bow. Invented in the Stone Age, a simple combination of string and spring to hurl projectiles, usually arrows, much farther, more powerfully, and more accurately than they could be thrown by hand. The shape, tension, material, length, weight, and curve of a bow all affect its spring energy. Bows are of four basic kinds: simple, made of a single piece; backed, two pieces of different materials glued together; laminated, three or more pieces of the same material glued together; and composite, three or more pieces of different materials glued together.

Bowie knife. An American single-edged fighting knife about 20 inches long overall, named for American frontiersman James Bowie (1796-836), but actually designed by his brother, Rezin. Evolved from the frontiersman's hunting knife and the straight-bladed "Arkansas toothpick," it featured a simple hilt; a flat, wide crossguard with a prong at each end angled about 45 degrees toward the point; a tempered steel blade, mostly straight, but, from the point toward the hilt about 3 inches, convex in front and concave in back; and a strip of soft metal, such as brass, inlayed along the back of the blade to catch enemy blades. It was edged blade-length in front and along the concave portion in back.

Breechloader. Any firearm that loads its ammunition through the rear of the barrel. Attempted for centuries, but barely practical in time for the Crimean War (1853-1856) and the American Civil War (1861-1865), it soon thereafter superseded muzzle-loaders and made repeating arms and automatic weapons possible.

Bren gun. A British light machine gun, the Bren Mk1, first produced in 1937 and used extensively in World War II (1939-1945). Because the British based its design on the Czech ZB/vz26, invented eleven years earlier, they coined its name from the "Br" in Brno, where the Czech gun was made, and the "En" in Enfield, where the British gun was manufactured. The Royal Small Arms Factory, Enfield, North London, was founded in 1804 and has been responsible for a great number of historically important weapons.

Brig. A sailing, two-masted, square-rigged, wooden warship, related to the nonnaval brigantine, smaller than a frigate but bigger than a sloop of war or corvette, carrying between 12 and 32 guns on one or one and a half decks. Brigs were common from the eighteenth century until the end of the age of sail.

Brigade. An army unit that, in the British army, is an operational formation led by a brigadier (or brigadier-general). The number of soldiers serving in a brigade varies tremendously. Essentially a brigade has to consist of two or more fighting units, along with an operational formation structure. In the Australian army in World War I (1914-1918), a brigade consisted of four battalions (4,000 soldiers at full strength), and three brigades formed one division. After World War II (1939-1945), in the North Atlantic Treaty Organization (NATO), a brigade would consist of 4,000-5,000 soldiers, but in the Swiss and Austrian armies, there could be as many as 10,000 soldiers in a brigade. Words similar to "brigade" are used in other countries; in the Estonian army, for example, a *brigaad* includes 8,750 infantry soldiers.

Broadsword. A large, straight European sword dating from the early Middle Ages, usually double-edged, often two-handed, intended for slashing, chopping, and cutting, rather than thrusting.

Browning automatic rifle (BAR). An American light machine gun, the .30-06-caliber M-1918A2, invented by John M. Browning (1855-1926). Weighing only 20 pounds, air-cooled, with gas-powered reload and a bipod at the muzzle, it was well known as the squad automatic of World War II (1939-1945).

Bunker-busting bomb. A bomb developed to penetrate targets buried deep underground. Although prototypes of this bomb were used in the Gulf War in 1991, their first major use was by the U.S. military in Afghanistan in 2002.

Caltrop. A small, throwable, defensive obstacle consisting of four metal spikes protruding from a central vertex, each at an angle of 120 degrees to the other three, so that whichever three form a tripod on the defended ground, the fourth will be sticking straight up. At Bannockburn in 1314, Robert the Bruce devastated the English cavalry with caltrops.

Canister shot. A type of case shot, preloaded into a brittle tin shell designed to disintegrate immediately upon firing and thus add its own fragments to the antipersonnel pattern of projectiles. It differs from grapeshot by being sealed in a container and from case shot by specifically incorporating a tin shell. Its advantage over both was ease of loading.

Cannon. A firearm too big to be carried by an individual soldier, an artillery piece, invented early in the fourteenth century, that exists in three basic forms: gun, howitzer, and mortar, which are distinguished by caliber, trajectory, projectile velocity, range, and barrel length.

Carbine. A rifle with a short barrel designed to be convenient for cavalrymen. Developed by the French during the wheel-lock era, it achieved its greatest renown in the nineteenth century, when early breech-loading carbines such as the Sharps, Enfield, Springfield, and Winchester became standard British and American cavalry issue.

Carronade. A short-barreled, large-caliber, relatively lightweight, smoothbore naval cannon, inaccurate but highly effective at short range, introduced by the Carron Company of Scotland in 1779 and common until the mid-nineteenth century.

Case shot. Short-range, wide-dispersion, antipersonnel muzzle-loading artillery ammunition. Consisting of small metal balls or shards and common during the last hundred years of the muzzle-loading era, it differs from grapeshot by being sealed in a container, which would either break, burn, or disintegrate as soon as the charge was fired, thus allowing the load to spread. A variety of case shot sealed specifically in a tin shell is canister shot.

Catapult. An ancient and medieval artillery engine using a lever to hurl large projectiles. Its power came from a leaf spring; the torsion of a twisted skein, as in the onager; or a huge counterweight, as in the trebuchet. Made obsolete by the development of the cannon, catapults nevertheless remained fairly common in warfare until the sixteenth century and were used as recently as World War I (1914-1918) to hurl grenades into enemy trenches. The term also refers to devices used to launch planes from aircraft carriers.

Cell. Although usually used to describe political groupings in which secrecy ensured that members of the cell did not know the identities of other members in order to avoid infiltrators and people who had been captured, this term was also applied to the soldiers in the National Liberation Front for South Vietnam (Viet Cong) during the Vietnam War (1960-1975).

Chain shot. A type of ammunition for smoothbore, muzzle-loading cannons. Compact when loaded but expanding when fired, it was designed for naval use in the sixteenth century to cut the rigging of enemy ships. Later it was also used by ground troops as an antipersonnel charge.

Chariot. An ancient attack vehicle, a two-wheeled backless cart with high front and sides, pulled by usually one or two but sometimes as many as four horses. It could contain either a single occupant, who both drove and fought, or two, one to drive and the other to shoot arrows, thrust spears, or slash with his sword. At Gaugamela in 331 B.C.E., the Persians used chariots with protruding scythes

affixed to rotate with the axles, but the maneuvers of Alexander's phalanxes snagged the scythes with one another and rendered the chariots ineffective.

Chassepot. A bolt-action 11-millimeter rifle invented in 1866 by Antoine Alphonse Chassepot (1833-1905) and carried by French soldiers in the Franco-Prussian War (1870-1871). Based on the Dreyse needle gun, which was standard in the Prussian army after 1848, it used a combustible paper cartridge. When the trigger was pulled, a needle pierced the cartridge from behind before hitting the primer and firing the charge.

Chemical weapons. Organic or inorganic agents, usually delivered by shell, intended to poison the enemy. Safety for the attacker is often achieved through the binary system, whereby two ingredients are kept isolated from each other within the shell until impact, when they combine to create the poison. Since World War I (1914-1918), various provisions of the Geneva Conventions and other international treaties have limited chemical warfare, especially the use of poison gas.

Cheval de frise (*pl.* chevaux de frise). Literally, a Frisian horse, a late medieval and early modern defensive obstacle consisting of many long spikes protruding radially from a central log, barrel, or other convenient cylindrical object serving as an axis. A good anticavalry defense for musketeers, it could safely be moved into position by four soldiers, two at each end. Not much used after the eighteenth century, it was finally superseded by barbed wire in the late nineteenth century.

Claymore. A gigantic two-handed Scottish broadsword with a blade up to 6 feet long. The traditional blade of Scotland, known in Gaelic as claidheamh mòr, it was developed in the late Middle Ages and used extensively throughout the Renaissance and early modern era.

Club. A short, stout, heavy, sticklike object, usually wooden, with a large knob on one end to crush skulls or break bones. Of prehistoric origins, it could have either a plain, blunt warhead or a spike driven through the warhead for added deadliness. Almost exclusively a weapon of traditional, preliterate, or aboriginal cultures, it nevertheless appeared also in more advanced cultures as armor-breaking weapons: the mace and the war hammer. Perhaps the most famous club is the Irish shillelagh, cut from the blackthorn tree.

Cluster bomb. Developed by the Soviet Union in the 1930's and common since the 1960's, an aerial bomb that jettisons its casing at a predetermined altitude to release dozens or even hundreds of small bombs, or bomblets, typically used as an antitank, antivehicle, or antipersonnel weapon.

Cohort. Consisting of approximately 480 soldiers (except for the first cohort of every legion, which had 800 soldiers), this term for a unit in the Roman army was subsequently used to describe a body of soldiers, of varying sizes, who were designated a particular task, like a column.

Column. A division of an army, often with no specific number of soldiers, that had the job of moving to a particular place, especially for sieges or for a specific task.

Company. In late medieval and early Renaissance times, this term often referred to the subunit of an army with a separate commander, such as Sir John Hawkwood's White Company, and there was no specific number of soldiers. Gradually the term "company" come to signify a subunit of a battalion or regiment, and in the case of the British army, it has, at full strength, 120 soldiers, commanded by a major. A company is further divided into two or more platoons. In the German army, the company is the subunit of a battalion, usually with twelve companies in an infantry battalion, making a total, at full strength, of about 80 soldiers.

Composition B. Also called cyclotol, a castable mixture of 40 percent TNT (trinitrotoluene) and 60 percent RDX (cyclo-1,3,5-trimethylene-2,4,6-trinitramine), insensitive to temperature and shock, commonly used as a military explosive because of its tremendous power to crush and shatter. It was the usual load of Allied bangalore torpedoes in World War II (1939-1945).

Composition C. Plastic explosive consisting of 80 percent RDX (cyclo-1,3,5-trimethylene-2,4,6-trinitramine) and 20 percent plasticizing agent, designated C-1 through C-4 according to which

plasticizer is used. Like all practical military explosives, it is insensitive to environmental conditions, safe to handle, and long-lived. It is frequently used in land mines.

Cordite. An efficient form of smokeless powder invented in Britain in 1889 by Sir Frederick Augustus Abel (1827-1902) and Sir James Dewar (1842-1923), consisting of nitroglycerin, guncotton, petroleum jelly, and acetone pressed into thin brown cords. Similar to ballistite, it was used extensively in small arms ammunition throughout the twentieth century.

Corps. In the ancient Egyptian army, a corps consisted of some 4,000 soldiers. During the eighteenth and nineteenth centuries, within the British army, the term was often used interchangeably with "regiment," when reference was being made to an infantry regiment. From the late nineteenth century, the "corps" referred to an army formation that consisted of two or more divisions but was itself smaller than an army. Traditionally in military books and maps, a Roman numeral was ascribed to the Corps: VI Corps, VII Corps, and so on. In the German army in World War I (1914-1918), at the start of the war, a German corps consisted of two divisions, each of 17,500 soldiers. There were also instances when specific units in the British, Australian, or Canadian armies had special corps that kept the former use, making them similar in size to regiments, that is, 1,000 or more soldiers. Examples of these include the Camel Corps, Medical Corps, Veterinary Corps, and, in the case of the German army in World War II (1939-1945), the Afrika Korps.

Crossbow. A shooting weapon invented in China about 500 B.C.E. and known in Europe by the end of the first millenium, consisting of a short, thick bow transversely attached to a wooden stock that featured a trigger, a groove to guide the projectile, and usually a detachable cranking mechanism to draw the string. Its ammunition was either stones, pellets, or short arrows called bolts or quarrels. With a range of about 400 yards (370 meters), it was so accurate and powerful that in 1139 the Lateran Council banned its use against Christians. After the Battle of Crécy in 1346, the British preferred the longbow, which could shoot six times as fast, but the crossbow, with its longer range, remained dominant on the Continent through the fifteenth century. By the mid-sixteenth century, it was obsolete in warfare, superseded by firearms, although it is still occasionally used by commandos because it is silent and also for its range and accuracy.

Cruise missile. A tactical, self-propelled, ground-hugging, guided missile developed by the United States and the Soviet Union in the 1960's and 1970's. A "smart bomb," capable of pinpoint accuracy, it can carry either nuclear or nonnuclear warheads and can be launched from land, sea, or air. The American sea-launched Tomahawk and the air-launched ALCM turbofan-powered cruise missiles proved devastating against Iraq in the 1991 Persian Gulf War.

Culverin. A long, smoothbore, muzzle-loading, medium- to large-caliber European field cannon of the fifteenth to seventeenth centuries. Since cast iron technology was not yet dependable for large objects, its barrel was not cast but constructed of overlapping and superimposed hoops of wrought iron. A typical culverin had a 6-inch bore and fired an 18-pound ball.

Cutlass. A short, curved, wide-bladed saber with a thrusting point and a stout hand guard, developed in Europe in the seventeenth century, remotely related to the English falchion of the thirteenth century, and used mostly in naval warfare and by pirates.

Dagger. Next to stones, probably the most ancient of all weapons, originally made of chipped flint. A sharp-pointed, straight-bladed knife intended primarily for stabbing, it can be held with the little finger toward the blade for powerful downward stabbing or with the thumb toward the blade for more versatile thrusting and slashing.

Davach. A subunit within the Irish army in early medieval times, which included enough soldiers to man one fighting ship.

Defoliant. Any chemical weapon intended to destroy plant life and thus prevent the enemy from taking cover in the forest or living off the land. The most

notorious was Agent Orange, used extensively by the United States in Vietnam and subsequently discovered to have debilitating long-term side effects on exposed personnel.

Depth charge. An antisubmarine high explosive device, first used in 1916 by the British against the German U-boats in World War I (1914-1918). Since World War II (1939-1945), depth charges have been standard armaments on destroyers, destroyer escorts, and PT boats. Typically, several are catapulted overboard simultaneously in different directions, set to explode at different depths to maximize the chance of hitting the target either directly or with shock waves.

Derringer. A small, easily concealable, short-barreled, medium- to large-caliber, usually single-shot rifled pistol, first manufactured about 1850 by Henry Deringer (1786-1868) of Philadelphia. With the *D* lowercased and another *r* added, the name became generic. John Wilkes Booth (1838-1865) used a derringer to assassinate Abraham Lincoln (1809-1865).

Destroyer. A fast, relatively small, motorized warship of the twentieth century, intended to defend fleets and convoys from all sorts of attack: surface, undersea, and air. It is armed with a great variety of weapons, including torpedoes, depth charges, antiaircraft guns, medium-caliber cannons, and sometimes missiles.

Destroyer escort. A motorized warship, smaller and usually slower than a destroyer, developed by the United States early in World War II (1939-1945) to support destroyers in their mission to defend fleets and convoys. Since 1975, it has been also known in the U.S. Navy as a frigate.

Detachment. A loose term to define a military unit assigned to another command on the battlefield; there is no set size.

Detail. A military unit within the British army, run from headquarters, for transport, intelligence, catering, or another purpose.

Dirk. A dagger used by the British navy in the eighteenth and nineteenth centuries and by Scots generally since the Middle Ages. This traditional Scottish weapon, regularly issued to regimental pipers, is characterized by a wide, straight, symmetrical, double-edged, tapering blade about one foot long. The genuine Scottish dirk has no guard, but the naval dirk does.

Dirty bomb. A device that uses conventional explosives to disperse radioactive material. Although tests have taken place in the United States, it is believed that the weapon is still speculative.

Dive-bomber. A small, maneuverable, propeller-driven airplane capable of steep, steady dives and abrupt, rapid climbs, intended to drop bombs accurately at low altitude and escape before antiaircraft fire or enemy fighter aircraft could bring it down. Armed with either bombs or torpedoes, it is especially effective for attacking ships broadside. Dive-bombing originated as a tactic in World War I (1914-1918) but achieved prominence in World War II (1939-1945) through such planes as the German Junkers Ju-87 Stuka, the Japanese Aichi D3A and Yokosuka D4Y, and the American Douglas SBD Dauntless and Curtiss SB2C Helldiver.

Division. In early modern times, a division was an administrative grouping made up of a number of infantry regiments, with no set size. During the eighteenth century, within the British army, a division was a subset of a battalion similar to what became known as a platoon. Since the late nineteenth century, a division in the British army, along with those of many other countries, has come to be a field formation comprising two or more brigades. In addition to these brigades, there is a divisional command structure that often has extra units assigned to it. In the Australian army during World War I (1914-1918), a division consisted of three brigades, and each brigade consisted of four battalions, making the number of soldiers in a division, when at full strength, around 12,000. In the German army in World War I, a division, at full strength, consisted of 8,407 infantry, 170 cavalry, 1,363 artillery, 838 pioneers, 757 divisional troops, and 108 in the divisional headquarters.

Drone. An unmanned aerial vehicle used in reconnaissance missions and also for remote-controlled bombing. Its task is to fly into areas where it would be risky to send crewed aircraft. Much use

of drones has been made by the United States in Iraq and in Afghanistan, and by Israel.

Dumdum bullet. A hollow-point or soft-nosed bullet designed to expand quickly upon impact, causing tremendous internal damage and leaving a horrible exit wound. Developed around 1891 by the British at their colonial arsenal in Dum Dum, India, near Calcutta, they used it in India and the Sudan in the 1890's until it was banned by the Hague Convention of 1899.

Dynamite. Powerful high explosive invented in 1867 by Alfred B. Nobel (1833-1896), consisting of an inert, porous substance saturated with nitroglycerin. Its greatest advantage is rendering nitroglycerin safe to handle, but because it cannot be stored for long periods without becoming unstable, it has limited military application.

Elephants. A type of pachyderm that not only provided transportation for soldiers and equipment but also functioned as the first "tanks." Used in warfare in India from prehistoric times and by the Persians against the Greeks in the fourth century B.C.E., elephants gained military importance, most famously in their role in Hannibal's crossing the Alps to attack Italy in 218 B.C.E. Elephants, aside from being monstrously strong, are fearless, difficult to kill, and a terror to enemy horses.

Equite. An elite Roman cavalry unit designed to protect the emperor and other high-ranking individuals.

Explosive projectile. Any hurled device designed to explode either on impact or at a predetermined point in its flight. Not limited to artillery shells, they may include hand grenades, long-range guided missiles, and even medieval firepots.

Falchion. A short, single-edged sword popular from the thirteenth to the sixteenth centuries in Europe, featuring a wide, heavy, straight-backed blade, a convex cutting edge near the point, and usually an S-shaped crossguard. It evolved into the cutlass.

Falconet. A very light, smoothbore, muzzle-loading, small-caliber European field piece of the sixteenth and seventeenth centuries, characterized by a long, narrow, cast-metal barrel, usually bronze. The largest known was a 3-pounder (that is, it fired a 3-pound ball). The name means "little falcon."

Fanika (or Fahnlein). A Finnish term used to describe a military unit in the Swedish army that follows a single banner into battle. Traditionally it consisted of about 1,000 soldiers, similar to a battalion, but during the Thirty Years' War (1618-1648) there were only some 500 soldiers in each fanika.

Farm tools. Throughout history, when large numbers of peasants either revolted or were impressed into service, their weaponry included their familiar tools from home. Scythes, sickles, threshing flails, pitchforks, and pruning hooks were extensively used in such conflicts as the Crusades (1095-1270), the Thirty Years' War (1618-1648), and the French Revolution (1789-1799). Minor modifications turn a sickle into a curved dagger or a pruning hook into a pole arm.

Fasces. A bundle of rods holding an ax. Used in war, it became the symbol of the authority of the Roman Republic and came to have significance similar to that of the later parliamentary mace in Britain and former British colonies. During much of the first half of the twentieth century, it was adopted as the symbol of the Italian Fascist Party.

Felucca. Slender, swift, lateen-rigged, wooden sailing ship of the Mediterranean, developed in the sixteenth or early seventeenth century. Favored by the Barbary corsairs until their demise at the beginning of the nineteenth century, it typically carried ten to fourteen guns (seldom, as many as twenty).

Field piece. Any light or medium-weight cannon designed to be highly mobile and versatile in the thick of battle. The term especially refers to the horse-drawn cannons of the muzzle-loading era. Most of the victories of Napoleon I involved his expert use of such artillery.

Fighter aircraft. Early in World War I (1914-1918), personnel in observation planes would fire pistols at enemy observation planes. Soon, two-seater planes were equipped with a swivel machine gun for the copilot. In 1915 Anthony Fokker (1890-1939) invented for the Germans a gear system to

allow mounted machine guns to fire forward without hitting the propeller, thus creating the first practical fighter planes. Ideal fighters are small, fast, and maneuverable. Propeller fighters such as the Japanese Mitsubishi Zero, the German Messerschmitt, the British Spitfire, and the American Flying Tiger reached their zenith in World War II (1939-1945) and were superseded by jets in the late 1940's.

Fighter jet. Although developed first by the Germans and later by the Allies during World War II (1939-1945), jet fighter aircraft did not see much action until the Korean War (1950-1953). Outstanding jet fighters include the Russian MiG (Mikoyan-Gurevich) series and the American F-11 Tiger, F-86 Sabre, and F-104 Starfighter.

Firepot. An ancient and medieval incendiary weapon, consisting of a ceramic container filled with an inflammable substance. Flung from a catapult, onager, or trebuchet, it was designed to ignite easily upon impact.

Fireship. A derelict wooden sailing ship or barge, set afire and sent among the enemy's wooden ships. It represented an effective and common naval tactic from ancient to early modern times.

Flail. A type of mace with one, two, or three warheads, usually solid iron spheres studded with spikes, attached to a thick, reinforced wooden handle by short lengths of chain. It was used for the same purpose as the mace, to crush armor, but the chains provided a whiplike effect that added velocity and force to the warhead.

Flak. Invented by the Germans in 1936, the 88-millimeter Flugabwehrkanone (FLAK36) automatic cannon, with an effective range of about 26,000 feet (8,000 meters), was the standard Nazi antiaircraft gun of World War II (1939-1945) and the basis of several later antiaircraft and antitank weapons. Allied airmen soon applied the term to antiaircraft fire in general, especially the hazardous flying debris from exploding antiaircraft shells.

Flamethrower. An offensive incendiary device whereby a single infantryman can safely and effectively shoot a stream of burning liquid from a high-pressure nozzle to distances of about 200 feet (60 meters). Developed during World War I (1914-1918) and used extensively in World War II (1939-1945) and Vietnam (1961-1975), it was a significant advance in military technology because fire is often dangerous for the attacking and attacked armies alike. Soldiers using flamethrowers typically wear flameproof armor, head to toe.

Fleet. Either the entire navy of any country or a substantial group of ships involved in a military action, under the command of an admiral.

Flintlock. A muzzle-loading firearm ignition mechanism, invented around 1610 and common from 1650 until the end of the muzzle-loading era in the mid-nineteenth century, a simple improvement of the snaphance, from which it differs by being single-action rather than double-action. When its trigger is pulled, the hammer pushes the pan cover away from the pan, thus creating sparks, igniting the primer, and firing the weapon.

Fragmentation bomb. Invented during World War I (1914-1918), an artillery shell or aerial bomb whose thick but brittle metal casing is scientifically designed to shatter upon impact, sending jagged debris in all directions as antipersonnel projectiles.

Francisca. A throwing ax used by the Franks in the early Middle Ages and by some Germanic peoples and the Anglo-Saxons in England. French in origin, a double-headed version of the francisca was used during World War II (1939-1945) by the pro-German Vichy government.

Frigate. A sailing, square-rigged, three-masted wooden warship larger than a brig but smaller than a ship of the line. It usually carried between twenty and forty-eight guns on two decks. The USS *Constitution*, "Old Ironsides," launched in Boston in 1797, was a forty-four-gun frigate. From 1950 to 1975, the U.S. Navy designated some large destroyers as frigates, and after 1975 the Navy used the term to refer to destroyer escorts.

Fusil. A light, small-caliber, French flintlock musket of the seventeenth century. British soldiers armed with these weapons were called fusiliers. Subsequently, *fusil* became the ordinary French word for rifle.

Galleon. A warship developed in Spain and England in the fifteenth century, trimmer and more streamlined than the floating fortresses of the fourteenth century. Without their high, overhanging forecastles and poops, but with three or four full-rigged masts, it was the first ship able to hold position against the wind while delivering broadsides to the enemy. The British were victorious over the galleons of the Spanish Armada in 1588 not only because of the weather but also because Sir Francis Drake's galleons were smaller, shallower, faster, and more maneuverable. The galleon was superseded in the seventeenth century by the British man-of-war.

Galley. A long, low, slender, shallow-draft warship of the eastern Mediterranean, usually rowed but equipped with a single square sail. Developed in Greece, Crete, or Phoenicia around the ninth century B.C.E. and later adopted by the Romans, it was the primary warship until the fall of the Roman Empire. With the foremost part of the prow at or just below the waterline reinforced and sharpened, its basic tactics involved ramming the enemy ship broadside; then it could be boarded. sunk, or set afire. Galleys were used in war as recently as the Battle of Lepanto (1571).

Garand rifle. A semiautomatic .30-06 caliber rifle invented in the 1930's by John C. Garand (1888-1974), engineer at the U.S. Armory, Springfield, Massachusetts. Also called the M-1, it had an eight-round magazine. When the U.S. Army made it the standard infantry weapon in 1936, it was the world's first semiautomatic rifle to be so honored. American ground troops carried it in World War II (1939-1945) and the Korean War (1950-1953).

Gas shell. A basic element of chemical and biological warfare, an artillery projectile filled with poison gas released at or just before impact. Used extensively in World War I (1914-1918), armed chiefly with mustard gas, phosgene, or lewisite, it differs from a gas grenade in that it is fired rather than thrown. Even though military poison gas was outlawed by the 1925 Geneva Protocol, most countries have continued to develop such weapons.

Gatling gun. A primitive machine gun invented in 1862 for the Union army in the American Civil War (1861-1865) by Richard Jordan Gatling (1818-1903), characterized by several, usually six to ten, revolving barrels that were cranked around to produce rapid fire. The Gatling gun was superseded by the machine guns of Hiram Stevens Maxim (1840-1916) in the 1890's, but the Gatling principle was employed for airborne and antiaircraft weapons in the late twentieth century, when very high rates of fire, in excess of six thousand rounds per minute, were desired.

Gladius. A short, straight thrusting sword carried by the Roman infantry legions. From its name derives the word "gladiator." It was superseded in battle by the spatha in the Christian Roman Empire.

Glaive. A type of pole arm whose head consists of a single blade resembling that of a sword. Common variants include a curved, single-edged, saberlike blade and a broadsword blade. It was developed by the French during the High Middle Ages and used primarily for slashing.

Grapeshot. A type of spreading antipersonnel and anticavalry muzzle-loading artillery ammunition, consisting of ten or twenty loose, grape-sized, solid metal balls packed as a group into a cannon. Very common in warfare from the eighteenth century until the end of the muzzle-loading era, it differs from case shot and canister shot by not being sealed in a container. The effect was like that of a giant shotgun. The Russians fired grapeshot into the Light Brigade at Balaklava in 1854.

Greek fire. An early medieval, and perhaps ancient, incendiary mixture of unknown ingredients, usually delivered by catapult in breakable containers and extensively used in naval warfare because it was unaffected by water. Some say it ignited on contact with saltwater and was first used in 673 by the Byzantines defending Constantinople against the Arabs. Others, who discount the story that Archimedes set Roman ships afire with mirrors during the Second Punic War (218-201 B.C.E.), suggest that he may have been the inventor and first user of Greek fire.

Grenade. A small bomb, either thrown by hand or launched from a hand-carried device. Developed in Europe in the sixteenth century, it originally

contained either gunpowder or an incendiary mixture, but later versions contain smoke screens, poison gas, or other chemical agents. Grenades are detonated by percussion, impact, or a short fuse activated just before throwing or launching.

Grenade launcher. Dating from the fifteenth century and in constant military use ever since, any short-barreled, wide-bore, muzzle-loading, personal firearm designed to throw grenades farther and more accurately than they can be thrown by hand. Some muskets and rifles can be temporarily converted into grenade launchers with specialized muzzle attachments. The 40-millimeter American M203 grenade launcher, standard infantry equipment in the 1990's, is easily combined with the M-16 rifle to create a double-barreled weapon.

Guided missile. Developed by the United States, the Soviet Union, and many other industrialized nations after World War II (1939-1945), a self-propelled, usually rocket-propelled, air- or space-traversing missile, distinguished from an ordinary missile by its being capable of having its course corrected during its flight. It can be ground-launched, air-launched, surface-ship-launched, or submarine-launched. Among water-traversing missiles containing guidance systems, guided torpedoes are generally not called guided missiles, but sea-launched tactical antiship missiles, such as the French Exocet and the American Harpoon, are. Inventing missile guidance systems required the prior development of radar, radio, and computers.

Guisarme. A type of pole arm whose head includes two blades curving away from each other, sharpened on the outer, or concave, edges. Invented in Europe in the eleventh century, it was used until the fifteenth for slashing, unhorsing, tripping, and thrusting.

Gun. In military parlance, always a cannon, never a personal firearm. As a piece of ordnance, it is usually a big, powerful, long-range cannon firing with a flat trajectory and thus is distinguished from howitzers and mortars.

Guncotton. An explosive compound, also called nitrocotton, a variety of nitrocellulose invented by German chemist Christian Friedrich Schönbein (1799-1868) in 1845 and produced by soaking plain cotton in nitric acid and sulfuric acid. Guncotton burns too fast to be a safe and efficient smokeless propellant for firearms, but it was later used in the invention and manufacture of practical smokeless powders.

Gunpowder. Although Roger Bacon (c. 1220-c. 1292) was the first Westerner to give exact directions for making gunpowder (in 1242), gunpowder had been developed by the Chinese many centuries earlier. A simple mixture of potassium nitrate, sulfur, and charcoal, gunpowder revolutionized warfare by enabling projectiles to be fired long distances from hollow tubes closed or partially closed at one end. Later improvements, such as powder B, ballistite, and cordite, include less volatile and less smoky varieties.

Halberd. A versatile type of pole arm whose head includes an ax on one side, a spike, pick, or hook on the other side, and a spear point at the tip. Developed in Switzerland in the thirteenth century, gradually improved through the sixteenth, and still carried by the Swiss Guards of the Vatican, it was an important multipurpose weapon of European foot soldiers during the Renaissance, employed to unhorse, thrust, parry, or slash. Horsemen would frequently become intimidated by companies of well-seasoned infantry armed with halberds.

Hand cannon. A primitive European muzzle-loading personal firearm, developed about 1400, featuring a long stock, short barrel, smooth bore, and large caliber. Intended to be fired from a bench-rest position, it featured, under the stock near the muzzle, a protruding spike to hook over the rest to prevent recoil. It was superseded by the harquebus about 1450.

Hand grenade. Invented in the sixteenth century and in constant military use ever since, a small explosive device designed to be thrown by hand and detonated by either impact or a time fuse. Among its most prominent users were the British Grenadiers of the eighteenth century. Twentieth century examples include the German Steilhandgranate (potato masher), the Japanese 97, and the American Mk2 "pineapple."

Harquebus. A European muzzle-loading firearm developed about 1450. Fired by either a matchlock or a wheel-lock mechanism, it was in general use until about 1550, when the snaphance was invented and the flintlock musket became possible. Also called an arquebus, hackbut, or hagbut, it evolved from the hand cannon, was heavy, bulky, short-range, and inaccurate, and was typically fired from a monopod or tripod.

Hazara. A relatively small unit within the Mongol army, sometimes called a minghan, consisting of 1,000 soldiers, similar in size to a Roman legion or modern battalion. Subsequently the Mongol army was reorganized into ming bashi, which also consisted of 1,000 soldiers.

Heavy artillery. Large cannons that differ from light artillery not only by weight but also by caliber, mobility, and purpose. Such guns are suitable for fortress defense, shore batteries, and siege work, but not for battlefield situations where quick adaptability could be the key to victory. The peak use of heavy artillery was in World War I (1914-1918), when guns of 40 centimeters and larger were moved by railroad or mounted on battleships.

Horse artillery. A type of field artillery in which the gunners ride horses. Until the end of the eighteenth century, guns, carriages, and caissons were pulled by horses while the gun crews and drivers walked. One of Napoleon's most important tactical innovations was to develop the horse artillery, dramatically increasing the versatility, mobility, and effectiveness of his cannon. In the American Civil War (1861-1865), the term referred to the Confederate practice of disassembling small howitzers, loading the components on packhorses, running them with the cavalry through terrain where normal gun carriages could not pass, then quickly reassembling them at the next battle.

Host. The term used in ancient Egypt to designate 250 chariots, which were subdivided into corps of 25 chariots each.

Howitzer. A type of cannon, originating in the seventeenth century, with a barrel longer than that of a mortar but shorter than that of a gun, designed to fire medium-velocity projectiles at medium to high trajectories.

Hundertschaft. A term that arose in early medieval times to describe a unit of about 100 fighting men. Subsequently it continued to be used to denote a unit of around 100 men, notably by the German State Police and the German Federal Police.

Huo. The smallest subunit of a Chinese medieval army. During the Tang Dynasty (618-907), it consisted of 10 soldiers.

Hydrogen bomb (H-bomb). A thermonuclear device that uses the power of an atomic fission reaction to fuse heavy hydrogen atoms, deuterium and tritium, into helium. Fused in this way, hydrogen releases about four times as much destructive energy as the same mass of uranium or plutonium in an atomic bomb. The United States tested its first hydrogen bomb in 1952, the Soviet Union in 1953.

Ikhanda. A corps within the Zulu army from the 1820's to the 1870's. During the Zulu (or Anglo-Zulu) War of 1879, the number of soldiers in a Zulu ikhanda varied considerably. The entire Zulu army was divided into three of these, and they consisted of between 2,400 and 15,000 warriors, each with a number of amabuthos, or regiments.

Impi. A nonspecific term referring to a number of Zulu warriors. The size of impi units varied considerably.

Incendiary bomb. Any chemical device intended to cause an outbreak of flames among the enemy, including fire bombs, napalm bombs, Molotov cocktails, and firepots. Some commonly used inflammatory agents are white phosphorus, gasoline, thermite, and magnesium.

Intercontinental ballistic missile (ICBM). A strategic weapon of mass destruction, the focus of the Cold War (1945-1991) arms race between the Soviet Union and the United States; a very long range, nuclear-armed guided missile, such as the Soviet SS-9, SS-16, SS-17, SS-18, and SS-19, and the American Minuteman III and Titan II, land-launched from underground silos. Similar, but shorter-range, missiles, such as the American Polaris and Trident, can be launched from submarines.

Ironclad. A motorized or, less commonly, sailing wooden warship armored with metal plates on its

hull and topsides, developed early in the American Civil War (1861-1865). As demonstrated in the classic draw between the USS *Monitor* and the CSS *Virginia* (formerly the USS *Merrimack*) at Hampton Roads, Virginia, on March 9, 1862, it revolutionized naval warfare.

Jacketed bullet. A small arms projectile consisting of a soft metal core, usually lead, coated with a harder metal, often copper, which is still soft enough to grip the rifling inside a gun barrel. It was standard military issue throughout the world as of the late nineteenth century. The main advantage of such ammunition is that it can be fired at higher velocity, thereby gaining a flatter trajectory and hence a longer range.

Javelin. The generic term for any light, usually short, spear whose sole purpose is to be thrown, sometimes with a throwing device to extend the arm and increase the weapon's range. Invented during the Stone Age, it was common among most ancient troops, especially the Greek hoplite infantry. One famous type of javelin is the Roman light pilum.

Jeddart ax. A type of pole arm whose head consists of a grappling hook on one side and, on the other side, a long ax-blade with an undulating edge and a spear point. Developed from the halberd and voulge, contemporaneous with the Lochaber ax in the sixteenth century, it could be used for scaling walls and unhorsing riders, as well as for thrusting, chopping, and slashing.

Jeep. Named by altering the acronym "GP" for "general purpose," a small, light, fast, tough, dependable, all-terrain motor vehicle with four-wheel drive, an 80-inch wheelbase, and often a machine gun mounted in the back, developed by the Americans in the late 1930's and used extensively in World War II (1939-1945), Korea (1950-1953), and Vietnam (1961-1975). (Jeep became a trademark for a civilian vehicle based on the military original.)

Judo. *See* Jujitsu.

Jujitsu. An unarmed Japanese martial art whose origins are lost in antiquity but whose basic principles were codified by samurai in the seventeenth century. Named from two Japanese words meaning "gentle skill," it is not the same as judo, "gentle art," a more recent derivative that emphasizes leverage and throwing. True jujitsu also involves complex maneuvers of kicking, punching, and holding.

Karate. Based on ancient Chinese boxing techniques, this hard-hitting, unarmed Japanese martial art features extraordinary leaps, chops, and kicks. It became systematized during the seventeenth century on the island of Okinawa and was named from two Japanese words meaning "empty hand." Tae kwon do, or "Korean karate," evolved from it in the 1950's.

Kidney dagger. Sometimes called ballock dagger, a symmetrical, double-edged, usually ornate European dagger of the thirteenth to seventeenth centuries, so called from the shape of its guard.

Knife. A hand weapon with a multipurpose short cutting blade, dating from prehistoric times and differing from a dagger in its versatility, from a sword in its length, and from a bayonet in its independence.

Knobkerrie. A Zulu striking or throwing club, carved from a single piece of hardwood, with a long, thin, straight handle and a smooth, small to medium-sized spherical or ovoid knob for the warhead.

Korps. *See* Corps.

Kris. A traditional Malay dagger, common throughout Southeast Asia, characterized by a long, asymmetric, double-edged, distinctively wavy or serpentine blade. A spur on one side of the base of the blade typically blends into a sort of hand guard. The handle is often ornate and the blade is sometimes ridged, laminated, and inlayed with elaborate designs or battle scenes.

Kukri. A traditional, single-edged, guardless, long knife or short sword of the Gurkhas of Nepal, characterized by the distinctive shape of its blade: straight out from the hilt to about a third of its length, then bent abruptly downward toward the edge at an angle of about 35 degrees. The back of the blade thus resembles a hockey stick, but the edge is sinuous and, from the vertex of the angle to the point, usually convex.

Lance. A light, long, narrow spear, often with a hand guard, carried by horsemen. An ancient weapon, it was used for tournament jousting in the Middle Ages, fell out of military favor in the Renaissance, but was revived by Napoleon. Throughout the nineteenth century until World War I (1914-1918), the lance was common among European and Asian cavalry regiments and Native American horsemen.

Land mine. An explosive obstacle or booby trap, typically buried just under the surface of the ground and easily detonated by pressure or a tripwire. A mainstay of twentieth century warfare, most land mines are antipersonnel devices, but some, set to detonate only from heavy pressures, are used as antitank or antivehicle weapons.

Langue-de-bœuf. A type of pole arm whose head consists mainly of a long, double-bladed spear point named for its shape, like that of the tongue of an ox (*langue de bœuf* in French). Developed by the Swiss and French in the fifteenth century, it was an early form of the partisan.

Laser. An acronym for "light amplification by stimulated emission of radiation." This emission of light in a continuous narrow beam of all the same wavelength (visible, ultraviolet, or infrared) was developed in the late 1950's. Its most successful military use is in rangefinding and guidance systems for precision-guided munitions (PGMs). The United States used laser-guided bombs with great effectiveness in the 1991 Persian Gulf War (1990-1991).

Legion. This division of the Roman army consisted of approximately 4,500-5,500 soldiers. In early Rome, at full strength, it was formed by 4,200 legionaries and 300 equites, but during the Roman Republic it had 5,200 legionnaires, as well as a range of auxiliaries.

Lewisite. A poison gas, $C_2H_2AsC1_3$, a colorless or brown, fast-acting blistering agent and eye irritant, smelling of ammonia and geraniums, synthesized in 1918 by Winford Lee Lewis (1878-1943), then a captain in the U.S. Army Chemical Warfare Service. It was used briefly by the Americans toward the end of World War I (1914-1918).

Light artillery. A cannon with a small to medium caliber and a light barrel, distinguished from heavy artillery mainly by its superior versatility. Usually wheeled and sometimes portable by as few as two or three soldiers, it can be quickly redeployed, realigned, and redirected amid volatile battlefield predicaments. The category includes field artillery, tank guns, automatic cannons, antiaircraft guns, antitank mortars, and most howitzers.

Limpet mine. Named after the marine gastropod mollusk that clings to undersea surfaces, a twentieth century naval explosive device containing magnets for divers or amphibious saboteurs to attach it to an enemy ship's metal hull below the water line. American versions from World War II (1939-1945) weighed about 10 pounds and used a time-delay fuse to detonate a high-explosive charge, usually torpex.

Lochaber ax. A type of pole arm whose head includes, on one side, a hook for scaling walls or unhorsing riders and, on the other side, a long, wide, convex blade. About half the length of the blade extends beyond the end of the staff. Developed in Scotland late in the sixteenth century, it was popular with clansmen in their struggles against the English until Culloden in 1746.

Long-range bomber. During World War II (1939-1945), the Americans developed aircraft that improved offensive punch by flying faster and farther for bombing runs. Early in the war, they replaced their B-17 Flying Fortress with the B-29 Superfortress, which flew at 350 miles per hour and could bomb a target 2,000 miles from base and return safely. The *Enola Gay*, which dropped the atomic bomb on Hiroshima, was a B-29. From the 1950's until the 1990's, the B-52 Stratofortress was the world standard for long-range jet bombers.

Longbow. The mainstay of English military success from the thirteenth to the sixteenth centuries, the longbow made archery more accurate and deadly, as well as inexpensive and uncomplicated. It was a simple bow about 6 feet long, drew about 80 or 90 pounds, and shot a 3-foot arrow about 270 yards (250 meters). In its time, the only personal

weapon that could outrange it was the crossbow, but the crossbow was slow, and a practiced archer could shoot ten or twelve arrows per minute. The longbow proved devastating against the French at Crécy in 1346.

Longship. A long, low, slender, shallow-draft vessel of the eighth to eleventh centuries, usually propelled by a single square sail amidships but also equipped with oars. Developed in Scandinavia by expert seafarers, it was the swiftest ship of its time and struck terror throughout coastal Europe as the preferred raiding ship of the Vikings. From the name of its flat rudder, "steer-board," always lashed to the right side of the ship, derives the word "starboard."

Lucerne hammer. A type of pole arm that evolved from the voulge in the fifteenth century and whose head consists of a heavy, four-pronged warhead: a stout, thick spear point for thrusting; a pick perpendicular to the staff; and two claws opposite the pick and also perpendicular to the staff. Its sole purpose was to smash or penetrate armor.

Mace. A type of club, developed early in the Bronze Age and refined during the Middle Ages, consisting of a short, thick staff and a massive metal warhead with four to six blunt blades or flanges parallel to the shaft and equally spaced around the head. Alternately, a mace warhead could be a solid metal sphere studded with spikes. It was used extensively by mounted knights to smash or dent armor. After knights in armor disappeared from warfare, the mace continued to be used as a ceremonial symbol of authority.

Machete. A long knife or short sword that originated in the tropical Spanish colonies in the sixteenth century, with a short, thick, single-edged, heavy blade for cutting sugarcane, hacking through jungle, or slashing enemies.

Machine gun. Developed in the second half of the nineteenth century, a complex automatic rifle capable of rapid fire with ordinary small arms ammunition. Prototypes were developed by James Puckle (1667-1724), Richard Jordan Gatling, and Thorsten Nordenfelt (1842-1920), but the first successful true machine gun was invented around 1884 by Hiram Stevens Maxim (1840-1916) and adopted by Britain, Germany, and the United States in the 1890's. Loosely, the term can refer to any automatic weapon.

Man-of-war ship. Developed in Britain early in the seventeenth century, any large sailing warship, especially either a frigate or a ship of the line, square-rigged and with at least two gun decks. Bigger, faster, more fully rigged, and more heavily armed than the ship it replaced, the galleon, it survived until the end of the age of sail and made the British navy supreme.

Mangonel. A medieval torsion-powered catapult closely related to the onager but smaller and, because its throwing arm traveled through an arc of only 90 degrees, less efficient. When cocked, the arm was horizontal; when released, it hit the padded leather buffer at the vertical, thus dissipating all its follow-through energy. Like all torsion engines, it was adversely susceptible to changes in humidity affecting the twisted skein.

Maniple. A subunit in the Roman Republican army that consisted of 120 legionnaires. There were thirty maniples in each legion.

Matchlock. Introduced in Europe in the early fifteenth century and used until the early eighteenth century in the West and until the mid-nineteenth century in Asia, muzzle-loading firearm ignition mechanism consisting of a lighted wick or match that the trigger action brought into contact with the pan of powder after the pan cover was lifted by hand.

Meros (*pl.* meroi). A unit within the Byzantine army consisting of about 3,000 soldiers. It was further divided into ten tagmata. Three meroi formed an army.

Metal-case cartridge. The earliest cartridge cases were either paper or cloth. They were satisfactory for muzzle-loaders but impractical for breech-loaders, especially when the shooter wanted to reload quickly and cleanly. The metal case replaced the paper case in the 1870's and had several important advantages, chief among which was that it expanded to seal the breech as soon as the weapon was fired. It not only made breech-loading efficient but also made automatic weapons possible.

Militia. Traditionally, any nonregular military unit made up of volunteers drawn from areas about to be attacked. In Britain, militias originated with the Anglo-Saxons during the Viking raids.

Mine. A naval or land booby trap, an explosive weapon usually set to detonate by pressure. Floating mines, moored just below the surface, were typically equipped in both world wars with Herz horns, a German invention that, when hit, triggers an electrochemical reaction that detonates the high explosive charge. Land mines can be laid by sappers or sown by mortars or from cluster bombs. Antimine apparatus includes probes, metal detectors, bangalore torpedoes, tanks equipped with flails, ploughs, or rollers, and minesweeping ships.

Minenwerfer. Literally, a mine thrower; a rifled, muzzle-loading, short-barreled, 25-centimeter German mortar of World War I (1914-1918), often loaded with gas shells.

Ming bashi. Sometimes known as a minghan, a division in the Mongol army, which previously had been divided into hazara. The ming bashi was further divided into ten yuz bashi.

Minié ball. Not really a ball, but a conical lead bullet with a hollow, expanding base, invented in 1849 by French army officer Claude-Étienne Minié (1804-1879). Firing the weapon pushed the bullet tightly into the rifling of the barrel, thus dramatically increasing its range and accuracy. The Crimean War (1853-1856) and the American Civil War (1861-1865) proved the superiority of the Minié rifle over both the smoothbore musket and the rifled musket, which used spherical ammunition.

MIRV. *See* Multiple independently targetable reentry vehicle.

Missile. Any self-propelled ammunition or projectile; loosely, the term can mean any hurled object. Its three main types of self-propulsion are jet engines, propellers, and rockets. Because rocket propulsion is by far the most common, some missiles, especially small ones, are loosely called rockets. In the late twentieth century, the term became mostly synonymous with "guided missile."

Mitrailleuse. A hand-cranked machine gun developed in 1869 for France and characterized by thirty-seven barrels in a hexagonal pattern inside a single air-cooled barrel. A metal ammunition block inserted vertically into the breech, transverse to the barrels, held all thirty-seven rounds. The French used the mitrailleuse too far back from the front lines for it to be effective in the Franco-Prussian War (1870-1871). The term later became the ordinary French word for machine gun.

Molotov cocktail. A terrorist and insurrectionist incendiary weapon developed in Europe in the early twentieth century and named after Soviet statesman Vyacheslav Mikhailovich Molotov (1890-1986). Consisting of a glass bottle filled with gasoline and plugged with an oil-soaked rag, it is thrown like a hand grenade as soon as the rag is ignited.

Morning star. A medieval clublike weapon with a spiked end (hence its name). Used by both infantry and cavalry, it became popular in the fourteenth century and was soon replaced by the more effective flail.

Mortar. A short-barreled, large-caliber, usually muzzle-loading cannon designed to lob shells at low velocity and high trajectory with moderate accuracy for short distances, such as over the walls of a besieged fortress. It has been in constant military use since the fifteenth century, but in the late twentieth it became mostly an antiarmor, guided-missile-launching weapon.

Multiple independently targetable reentry vehicle (MIRV). A type of nuclear warhead on either an intercontinental ballistic missile (ICBM) or a sea-launched ballistic missile (SLBM), developed in the 1970's, consisting of a cluster of guided missiles to saturate the general area of the target and make antimissile defense more difficult for the enemy.

Musket. Any muzzle-loading, long-barreled, personal firearm, originally smoothbore, though it could be either smoothbore or rifled. Invented in the fifteenth century, it was a standard infantry weapon for four hundred years until superseded by the breech-loading rifle in the 1860's.

Mustard gas. A poison gas, $C_4H_8C1_2S$, an acrid, noxious substance that penetrates and irritates skin, causes severe blisters, and can cause blindness. It was used extensively by both sides in World War I (1914-1918).

Muzzle-loader. Any firearm, either a personal weapon or an artillery piece, that loads its charge and projectile through the front end of the bore. Muzzle-loaders dominated for almost six hundred years, but, with the exception of mortars, most military firearms since the late nineteenth century have been breechloaders. The greatest drawback to muzzle-loaders is that they cannot repeat.

Naginata. A traditional Japanese pole arm whose head consists of a long, high-quality, curved, saberlike sword blade rigidly attached to the staff with an overly long shank or tang. An expert in naginatajutsu, the martial art of wielding this weapon, was a very deadly warrior.

Não. A sailing, deep-draft, broad-beam Portuguese merchantman and warship, called *nau* in Spain and carrack in England, developed in the late thirteenth or early fourteenth century, probably by Basque shipbuilders. Usually with three or four masts, armed with one or two decks of bronze cannons, and full-rigged, it was sturdy but slow. Famous nãos include the *Santa Maria*, Christopher Columbus's flagship; most of Ferdinand Magellan's fleet that circumnavigated the world from 1519 to 1522; and the *Henry Grâce à Dieu*, Henry VIII's naval flagship.

Napalm. An incendiary substance, ammunition for flamethrowers and firebombs, developed by the United States in 1942 and used extensively in the Pacific theater of World War II (1939-1945) and in Vietnam (1961-1975). Also called jellied gasoline (especially in its early years), it exists in several formulas, the most successful of which is napalm-B: 50 percent polystyrene, 25 percent benzene, and 25 percent gasoline. The name derives from two of its original ingredients, naphthenic acid, or aluminum naphthene, and palmitic acid, or aluminum palmate. Napalm adheres to its target, making it difficult to extinguish.

Nerve gas. Any gas composed of a nerve agent or agents that forms a chemical weapon capable of being used against opponents. It was first developed in Germany in 1936 but was most extensively used against the Kurds in the Iran-Iraq War of 1980-1988.

Neutron bomb. The so-called dirty bomb, developed in the 1970's, an enhanced radiation bomb intended as an antipersonnel tactical nuclear weapon, designed to do minimal damage to nonliving structures but to kill or incapacitate all animal life within a certain radius.

Niru. A subunit in the Chinese army during the Qing (Ch'ing) Dynasty (1644-1912) consisting of about 300 bannermen who were drawn from the Manchu minority.

Nuclear-powered warship. The technology of substituting nuclear fuel for diesel in oceangoing vessels, especially effective for submarines, enabling them to stay submerged much longer and refuel less frequently, thus increasing the threat of the sea-launched ballistic missile (SLBM). The first nuclear-powered submarine, the USS *Nautilus*, was launched in 1954.

Nunchaku. A Japanese weapon developed from the flail used in the threshing of rice. It consists of two sections of wood (or later metal), attached by a chain, and was similar in some ways to the European flail.

Oil pot. Defensive weapon for besieged medieval garrisons, a large metal cauldron containing hot oil to be poured on attackers trying to scale the walls.

Onager. A light, versatile, mobile catapult developed by the Romans, probably in the third century, so called because, after launching its load, when the throwing arm landed on the padded leather buffer at the front of the stout wooden frame, it kicked like its namesake, the Asian wild ass. Its power came from a skein twisted around one end of its arm, which traveled through an arc of about 135 degrees.

Ordnance. A term with two distinct meanings in military parlance, depending on context. On one hand, it means military equipment and hardware

in general—not only weapons and ammunition, but also vehicles, tools, and durable supplies. On the other hand, and more properly, it means artillery, cannons, and their ammunition. Ordnance officers are responsible for procuring and maintaining this matériel and ensuring that the artillery is in good working order.

Pack. A grouping of submarines, specifically German U-boats in World War I (1914-1918) and World War II (1939-1945).

Parang. The Malay name for the jagged-edged, oddly angled sword traditionally used by the Dyak headhunters and pirates of Borneo. The tip is sometimes squared off, with three or more separate points in line. The hilt is usually guardless and often elaborately decorated with horn, hair, or feathers.

Partisan. A type of pole arm whose head consists mainly of a long, broad, double-bladed spearhead, characterized by two small, winglike extensions or flanges at the base of the spearhead curving up toward the point. It evolved from the langdebeve (French langue-de-bœuf) in the sixteenth century and was common throughout the seventeenth. In William Shakespeare's *Hamlet* (act I, scene i, line 144), Marcellus asks whether he should strike the ghost with his partisan.

Patriot missile. This U.S. missile was developed in 1981 as a surface-to-air missile, used mainly to shoot down incoming enemy missiles. There was much publicity about its deployment and use during the Gulf War of 1990-1991.

Patrol. A military unit involved in a specific task, on land, at sea, or in the air. It has no fixed size.

Patrol-torpedo (PT) boat. A very small, very fast, shallow-draft, motorized vessel, typically armed with torpedoes, machine guns, and depth charges, used extensively by the Americans in the Pacific theater during World War II (1939-1945). John F. Kennedy became a war hero while commanding PT-109.

Percussion cap. A small container of priming substance that is detonated when struck in a specific way, thus setting off the main charge and propelling the projectile down the barrel of the firearm. Alexander John Forsyth (1769-1843), a Scottish minister, patented the first practical percussion firing mechanism in 1807. His invention proved to be among the most important in the history of firearms, because it eventually made possible metal-case cartridges, breech-loading, rapid fire, and quick reloading. Cartridges are designated according to the placement of their internal percussion caps: rimfire, centerfire, and the obsolete pinfire.

Petard. Explosive demolition device of the sixteenth century, consisting of a container of gunpowder which could be placed against a wall, gate, portcullis, or drawbridge, then detonated in an attempt to open a breach. Because of its extraordinarily loud report, it was named after the French word for "to break wind." Because so many of its users were killed by the explosion before they could get away, the phrase, "hoist with (or by) one's own petard" arose, meaning literally to be "blown up by one's own bomb," or defeated by one's own designs.

Petronel. A large-caliber matchlock carbine developed in France in the late sixteenth century, featuring a banana-shaped butt, curved sharply downward for bracing the weapon against the chest.

Phosgene. Poison gas, $COC1_2$, a colorless lung irritant that smells like freshly cut grass. It causes choking death by pulmonary edema (that is, by drowning in one's own mucus) and was used extensively by both sides in World War I (1914-1918).

Pike. A very long type of pole arm whose head consists mainly of a heavy but narrow spear point rigidly attached to the staff with a long metal shank. The pike dates from ancient times, but its most celebrated tactics involved infantrymen creating defensive formations such as the mobile cheval de frise against enemy cavalry in the sixteenth to eighteenth centuries to allow musketeers safety while reloading. Such pikes could be 16 feet (5 meters) long.

Pilum. A Roman spear, standard equipment for foot soldiers in the legions. It existed in two forms: one long, heavy, often with a hand guard midway down the shaft, and used mainly for thrusting; the

other short, light, without a hand guard, basically a javelin with a small head designed to break off upon impact.

Pistol. A short-barreled handgun, invented in the late fifteenth or early sixteenth century, frequently in military use as an officer's sidearm. Its one-handed operation made it suitable for cavalrymen. In automatic or semiautomatic pistols, the magazine can be conveniently contained in the handle.

Plastic explosive. A stable, moldable, high-explosive mixture created by combining a plasticizing agent such as oil or wax with a high-explosive compound such as RDX (cyclo-1,3,5-trimethylene-2,4,6-trinitramine) or TNT (trinitrotoluene). First developed in the 1890's, research into plastic explosives expanded dramatically during and after World War II (1939-1945), resulting in such products as composition C.

Platoon. A subunit of an army company; in the case of the British army, there are three platoons in a company. At full strength, it consists of between 30 to 40 soldiers, and it is commanded by a subaltern. It is further divided into sections.

Polaris missile. This missile, first developed in 1960 in the United States, was an early submarine-launched missile used by the U.S. Navy and the (British) Royal Navy.

Pole arm. Any long, multipurpose spear. Pole arms have been developed at every time and in every culture, but especially in Europe throughout the Middle Ages. The typical pole arm was used extensively by foot soldiers and palace guards until the nineteenth century and consisted of a large, finely crafted metal head rigidly affixed to a wooden staff. Varieties include the bill, guisarme, glaive, halberd, jeddart ax, langue-de-bœuf, Lochaber ax, Lucerne hammer, partisan, pike, poleax, spetum, and voulge.

Poleax. A type of pole arm whose head includes a broad-bladed ax on one side. There may be a spear point at the tip of the head and either a spike, pick, or hook on the other side, so that the weapon would resemble a halberd. It was developed in Europe in the late Middle Ages and used throughout the Renaissance and early modern era.

Pom-pom. So named from the sound of its report, a small-caliber automatic cannon whose reloading mechanism is powered by the firing of each previous round. Developed in the 1880's and 1890's by Hiram Stevens Maxim and originally intended as a mounted naval gun, its first use was as a field piece by both the British and the Boers in the Second Boer War (1899-1902). In subsequent naval and antiaircraft use, it was typically mounted in pairs. The British used a 37-millimeter version as a field piece in World War I (1914-1918).

Poniard. A Renaissance French dagger with a long, slender, triangular or square blade, somewhat resembling a stiletto. In combat it was often wielded in conjunction with the rapier as a parrying weapon. The name derives from *poing*, the French word for fist.

Powder B. The first successful smokeless powder, invented in 1885 by Paul Vieille (1854-1934) and soon adopted by the French army. It consists of nitrocelluose gelatinized with ether and alcohol, evaporated, rolled, and flaked.

Pursuit plane. From 1920 to 1948, American fighter aircraft were officially designated "Pursuit" and were numbered with the prefix "P." Among the outstanding planes in this series were the Curtiss P-1 Hawk, the Boeing P-26 Peashooter, the Lockheed P-38 Lightning or Fork-Tailed Devil, and the Curtiss P-40 Flying Tiger.

Quarterstaff. A particularly stout medieval English stave of oak or ash, about 8 feet long and 1.5 inches thick, occasionally banded with iron at both ends and commonly wielded with one hand in the middle and the other near one end. A surprisingly versatile weapon in the quick hands of an expert, it can stun, stab, crush, unhorse, fracture, or even kill. The legendary meeting of Robin Hood and Little John involved their famous quarterstaff duel on a narrow bridge.

Rapier. A long thrusting sword developed in Europe in the sixteenth century and popular until the eighteenth. With a rigid, slender, straight blade of fine steel and usually an elaborate hilt and hand guard, it served the privileged classes, both civilian and

military, as a dueling weapon, an instrument of stealth and assassination, and a symbol of rank and authority.

RDX (cyclo-1,3,5-trimethylene-2,4,6-trinitramine). Also called cyclonite or hexogen, one of the most common military explosives of the twentieth century, especially in World War II (1939-1945). Invented in 1899 by the Germans and named by the British, its name is an acronym for "Research Department Explosive." More powerful than TNT (trinitrotoluene) and comparatively stable, RDX is often mixed with TNT (trinitrotoluene), as in torpex, the standard torpedo load, or in aerial bombs and artillery shell fillings.

Recoilless rifle. Invented by the Americans during World War II (1939-1945), a hollow tube, open at both ends, allowing a single soldier to fire an artillery shell from the shoulder. The American M20 superseded the M9A1 after World War II (1939-1945). The Swedish Miniman and the German Armbrust are late twentieth century disposable recoilless antitank guns firing just one load of shaped charge, that is, a shell that explodes on the outer surface of the armor and bores a hole through it.

Regiment. In the British army, a permanently established unit within the infantry, and also the Royal Armoured Corps, Royal Artillery, Royal Engineers, Royal Signals, or Army Air Corps, being commanded by a lieutenant colonel. It could consist of a number of battalions, and most regiments had county or regional names showing where they were raised or had connections. Within the German army in World War I (1914-1918), regiments were assigned names of a king, prince, or other military identity.

Repeating rifle. A breech-loading personal firearm, using manual action to feed the next round from a magazine into the firing chamber. Developed independently and gradually by many inventors in the mid-nineteenth century, its eventual perfection early in the twentieth century was made possible by two innovations: the metal-case cartridge and smokeless powder. The repeating action can be a lever, as in the Winchester 1873; slide, as in the Colt Lightning; or bolt, as in most World War I (1914-1918) repeaters.

Revolver. A type of breech-loading pistol, invented in the mid-nineteenth century, classified in four basic kinds according to how the multichambered cylinder is exposed for reloading: side-gate, where a flap opens on one side of the weapon; break-open, where the barrel swings down on a hinge; swing-out, where the cylinder swings to one side on its hinge; and removable cylinder. A revolver is either single-action, if it needs to be cocked manually, or double-action, if the trigger cocks the hammer. Famous manufacturers include Tranter, Webley, Colt, and Smith and Wesson.

Rifle. Any long-barreled personal firearm, either muzzle-loading or breech-loading, that has spiral grooves machined inside the barrel to spin the bullet, thus increasing its accuracy, range, and power. Invented in the fifteenth century and first popularized by the American colonists in the mid-eighteenth century, it superseded smoothbore weapons in the 1860's. Outstanding examples are the Winchester, M-1, Springfield, and Enfield.

Robot bomb. An early type of guided missile developed by both sides in the European theater late in World War II (1939-1945), a small drone, or pilotless airplane, loaded with high explosives and sent on a descending course toward its target. The best known is the jet-powered Nazi V-1 (Vergeltungswaffe Eins), used against England in 1944.

Rocket. A self-propelled airborne missile, powered by the rearward thrust of gases from burning either solid or liquid fuel, invented by the Chinese about 1000, developed in Europe in the sixteenth century, and made practical for warfare by Sir William Congreve (1772-1828). It was developed into a major element of modern warfare by Konstantin Eduardovich Tsiolkovsky (1857-1935), Robert Hutchings Goddard (1882-1945), and Wernher von Braun (1912-1977). The first important military rocket was the German V-2 of World War II (1939-1945).

Rocket launcher. Developed by all sides during World War I (1914-1918), any device designed to make small rockets more portable, versatile, and mobile as artillery ammunition. In the form of a mortar or recoilless rifle, a rocket launcher and its

ammunition can be mounted on a tank, jeep, or gun carriage, or carried by one or two infantrymen, who fire it either handheld or from a bipod or tripod mount.

Rubber bullet. Also called a baton round, a large-caliber antimob projectile, typically 37-millimeter, developed by the British in the 1960's and designed to stun and intimidate rather than kill, although it can kill if fired at close range. The same specialized weapons that fire it can also fire canisters of tear gas, smoke screen, and other antiriot ammunition.

Sa. A subunit of the ancient Egyptian army that consisted of between 200 and 250 soldiers. Each fought under a different standard in New Kingdom Egypt (sixteenth-fourteenth dynasties, 1570-1070 B.C.E.).

Saber. A long slashing sword invented in Europe in the eighth century. Used in most wars since then, it achieved its greatest prominence as a cavalry weapon in the nineteenth century. Usually curved with a blade-length single edge on the convex side, it could also be edged a few inches down from the point on the concave side for back-slashing.

Sai. A Japanese three-pronged weapon, a long dagger. Often it was attached to a long pole, which in some ways made it similar to the European trident. It was effective against cavalry.

Samurai sword. A traditional weapon of the feudal Japanese warrior class who followed the military religion of bushidō. This high-quality, gently curved, single-edged, two-handed, long sword features a small guard, long handle, and elaborate workmanship. Known in Japan as a daisho, nodachi, tachi, or katana, depending on length and style, its standard design was established in the early ninth century by the great swordsmith Yasutsuna.

Sax. Also called a scramasax, a long dagger or short, straight, iron sword of the Northern European tribes in the Dark Ages.

Scimitar. A traditional saber of Islamic nations, developed prior to the Crusades, characterized by a long, thin, single-edged, crescent-shaped blade. It was made from Damascus steel, which was prepared at a very low temperature. Varieties include the Persian shamshir, the Turkish kilij, and the Arab saif.

Scud missile. A Soviet tactical nuclear or high-explosive missile, liquid-fueled, relatively short-ranged, and equipped with an inertial guidance system. Scuds with nonnuclear warheads were used ineffectively against Israel by Iraq in the 1991 Persian Gulf War.

Section. A subunit of a platoon in the British army. At full strength, it consists of between 7 and 10 men, serving under the command of a noncommissioned officer. There are generally three sections in a platoon.

Semiautomatic firearm. Any firearm that loads automatically but fires only one shot for each squeeze of the trigger. Mechanically, it is midway between a repeating rifle and a fully automatic weapon. The earliest was the 1893 Borchardt pistol.

Shell. Any cannon-fired projectile filled with explosive, typically designed to explode at a given point in its flight or upon impact. The earliest artillery shells, in the fifteenth century, were hollow iron spheres filled with gunpowder and fitted with fuses. Besides varieties of gunpowder or black powder, common explosive shell fillings include picric acid, ammonium picrate, TNT (trinitrotoluene), amatol, RDX (cyclo-1,3,5-trimethylene-2,4,6-trinitramine), and PETN (pentaerythitol tetranitrate).

Ship of the line. A large three-masted, square-rigged, sailing warship with at least two and usually three fully armed gun decks, carrying between 64 and 140 guns, so called either because it was powerful enough to hold the line of battle or because, with sister ships fore and aft, they formed an impregnable line. Developed by the British in the seventeenth century, it was the mainstay of naval power in general and the British navy in particular for the next two hundred years, superseded only by ironclad and motorized vessels.

Shrapnel. An antipersonnel explosive shell invented in the 1790's by British artillery officer Henry Shrapnel (1761-1842), consisting of a case of small shot with a fuse designed to detonate over

the heads of enemy soldiers. The term also loosely refers to any small airborne metal fragments or debris from an explosion.

Siege artillery. Class of large weapons, originally only mechanical instruments such as catapults and trebuchets, but later also explosion-powered weapons such as mortars and other large firearms, employed during sieges to breach walls, destroy defensive works, and keep besieged garrisons confined.

Siege tower. A tall, shielded platform that could be wheeled up to a besieged wall for archers inside the platform to shoot down on defenders. Because they were so vulnerable to fire, siege towers were covered with water-soaked hides or metal plates. In a famous incident during the Siege of Acre (1191) by King Richard I of England (1157-1199) in the Third Crusade, the Muslim defenders first saturated a huge copper-plated Christian siege tower with a flammable liquid, then set it afire with a burning log hurled from within the fortress by a trebuchet.

Sling. Invented in the Stone Age and existing in myriad forms ever since, a simple flexible or elastic device for extending the range and velocity of hurled objects. The basic weapon is just a small pouch in the middle of a thong. The warrior places a stone in the pouch, grabs both ends of the thong, whirls the sling, and releases one end at the optimal moment, as David did in his famous encounter with Goliath in 1 Samuel 17. Slings are sometimes attached to certain kinds of catapults, such as the trebuchet.

Sloop of war. A single-masted, sailing, wooden warship, rigged fore and aft with a lone jib, carrying between ten and twenty-eight guns on a single deck. Sometimes called a corvette, a ship of this class could also have a small foremast, and if so, it could be square-rigged. Developed by the British in the late seventeenth and early eighteenth centuries, it was a staple of naval warfare until the middle of the nineteenth century.

Smokeless powder. Several attempts were made in the mid-nineteenth century to find an explosive that would burn more completely, produce less smoke, and thus be a more effective propellant for firearms than gunpowder. Prussian major Johann Schultze offered a prototype in 1864, but it burned too quickly, violently, and uncontrollably. The first successful smokeless powder was powder B, developed in France in 1884. The French produced the first smokeless powder cartridge in 1886. Other successful smokeless powders include ballistite and cordite. Such powders are either single-base, consisting of mostly nitrocellulose or guncotton, or double-base, consisting of nitrocellulose or guncotton and nitroglycerin. Conventional munitions typically use double-base powder.

Snaphance. Invented in Europe, perhaps by the Dutch, sometime between 1550 and 1570, a major technological advance in muzzle-loading firearm ignition mechanisms. When the trigger is pulled, the powder-pan cover swings up and the hammer swings down so that, when the two collide, sparks are produced which, as the hammer continues down into the pan, ignite the priming powder and fire the weapon. The snaphance achieved great popularity in the seventeenth century and made the flintlock possible.

Snickersnee. From two Dutch words meaning "thrust" and "cut," a large knife or short, saberlike sword used in Europe in the eighteenth century for both thrusting and cutting. The term has also become generic for any swordplay.

Spatha. An ancient Roman sword with a broad blade for slashing. Longer than the gladius, it was used by both infantry and cavalry in the last centuries of the Roman Empire.

Spear. Any long, pointed shaft for either thrusting or throwing. In prehistoric times it was first just a sharp stick, but later in the Stone Age hunters and warriors added sharp heads of stone, bone, teeth, or ivory. As knowledge of metallurgy grew, so did the sophistication and keenness of spearheads. By the Renaissance, European spears were highly specialized, some involving the functions of the ax or sword as well as the spear. By the twentieth century, most spears were only ceremonial.

Spetum. Type of pole arm evolved from the trident. In the middle of the warhead was a langdebeve (French langue-de-bœuf) spear point and at the

sides were a symmetrical pair of shorter pointed blades, each with one or more bill hooks on the outer edge. A very versatile weapon for both thrusting and slashing, it combined the best features of the partisan, the guisarme, and the bill.

Squadron. A unit from the (British) Royal Armoured Corps, the Royal Engineers, the Royal Corps of Signals, or the Army Air Corps. At full strength, it consisted of between 50 and 100 men, often further divided into troops, sections, or flights. After 1882, in the United States, cavalry were divided into squadrons; before then there were cavalry battalions.

Star shell. A nineteenth century artillery projectile that explodes in midair, optimally at the high point of its arc, releasing a bright display of sparks, either to illuminate a target or to signal friendly forces. Used during the British night attack on Fort McHenry on September 13, 1814, these shells were immortalized by Francis Scott Key (1779-1843) in "The Star-Spangled Banner" as "the bombs bursting in air."

Stave. A peasant weapon of the Middle Ages, especially in England, where it evolved from the walking stick into a long club and became the standard defense for pedestrian travelers as well as a popular infantry weapon. The toughest kind of stave is the quarterstaff.

Stealth bomber. The American B-2 Spirit bomber, developed in the 1980's as part of President Ronald Reagan's Strategic Defense Initiative (SDI), characterized by its unique bat-wing appearance and its ability to avoid detection by enemy radar. Even though it first flew in 1988, it was not flown in the 1991 Persian Gulf War because it was not capable until 1996 of delivering nonnuclear bombs. It flew against Serbia during the Kosovo crisis of 1999.

Sten gun. A British 9-millimeter light, simple, inexpensive submachine gun invented in 1940 by Major Reginald Vernon Sheppard and Harold John Turpin. The name comes from the "S" in Sheppard, the "T" in Turpin, and the "En" in either Enfield Small Arms Company or England. Versatile, effective, and often having a collapsible stock, nearly four million Sten guns were manufactured during World War II (1939-1945). American soldiers in the European theater, equipped with more sophisticated weapons, called it the Stench gun.

Stiletto. A thin, symmetrical, Renaissance Italian dagger with a round, square, or triangular blade and no edge, used only for stabbing. Also called a stylet, some round-hilted varieties were used by infantrymen as plug bayonets. A highly specialized stiletto, the fusetto, had a slender, graduated, cone-shaped or isosceles-shaped blade for early artillerymen to gauge the bore, clean the vent, and puncture the powder bags of muzzle-loading cannons.

Stones. Always available, and with deadly power obvious even to the most prehistoric of our hominid ancestors, small, jagged rocks picked off the ground and hurled are the most ancient of all weapons. Still in prehistoric times, early humans learned to chip stones into sharper hand weapons, rudimentary knives, and later arrowheads, spearheads, and ax-heads. Naturally smooth or artificially smoothed stones became ammunition for slings.

Submachine gun. A fully automatic personal firearm, small and light enough to be fired by a single individual without support, developed between the world wars, in particular by John Taliaferro Thompson (1860-1940), inventor of the most famous submachine gun, the "tommy gun." The "sub-" prefix refers only to size and weight, not to either the mechanism or the degree of automatic operation.

Submarine. An undersea naval craft. David Bushnell (1742-1824) used a one-man submarine, the *Turtle*, in the American Revolution (1775-1783). A Confederate nine-man, hand-cranked submarine, the CSS *Hunley*, sank the USS *Housatonic*, and itself, in 1864. The first practical motorized submarines were developed in the United States by John Philip Holland (1840-1914). During World War I (1914-1918), the deadliness of the German U-Boat wolf packs proved submarines an indispensable aspect of effective naval warfare. The first nuclear submarine, the USS *Nautilus*, was launched in 1954. Torpedoes are

the standard armament of submarines, but since the Cold War (1945-1991) many have also carried missiles.

Surface-to-air missile (SAM). A small, defensive, guided missile launched from a usually mobile ground station toward an airborne target. As either an antimissile missile or an antiaircraft weapon, it can be equipped with a small nuclear warhead. The smallest have a range of about 6 miles (10 kilometers) and can be fired by one soldier from a shoulder-held recoilless launcher. The largest have a range of about 40 miles (65 kilometers) and are launched from a semipermanent launch vehicle.

Sword. Any edged weapon with a long blade and usually a sharp point. Invented in the Near East about 6000 B.C.E., it may have been one of the earliest things that humans learned to make out of metal, though its technology did not become practical until the Iron Age, about 1000 B.C.E. Some varieties of sword, such as the rapier, are mainly for thrusting; others, such as the saber, mainly for slashing; and a few, such as the cutlass, are dual-purpose. A basic weapon in nearly every war until the end of the nineteenth century, the sword since then has been used for mainly ceremonial purposes.

Tae kwon do. *See* Karate.

Tagma (*pl.* tagamata). A tactical unit in the Byzantine army consisting of about 300 soldiers. Ten tagmata formed a meros.

Tank. A motorized, fully armored attack vehicle running on self-contained tracks, usually with guns mounted in a revolving turret, invented by the British in 1915 and first used in battle at Flers-Courcelette on September 15, 1916. The Allies used nearly five hundred tanks at Cambrai in November, 1916. The Germans were slower to recognize the value of this new technology, and the first tank-versus-tank battle occurred at Villers-Bretonneux on April 24, 1918. Early in World War II (1939-1945), German Panzers dominated, and it was the Allies' turn to play catch-up, which the Americans did very well with the Sherman tank. Tanks were a mainstay of ground warfare throughout the twentieth century.

Tear gas. Any solid, liquid, or gaseous substance that irritates the mucous membranes when dispersed. Although used primarily in riot control rather than in military operations, it is also useful as a nonlethal system of disabling enemy combatants. As a result it is often used in hostage situations.

Thermonuclear device. Any bomb that relies upon the principle of the fusion of atoms of low atomic weight. At the dawn of the twenty-first century, they were the most powerful bombs yet produced. To fuse the nucleus of one atom with another requires tremendous heat as a trigger and produces tremendous heat when accomplished. Since the early 1950's, these bombs have been extensively tested, manufactured, deployed, and stockpiled, although never used in warfare.

Time bomb. Any explosive device with a time-delay fuse set to detonate at an exact, predetermined time and usually hidden in or near its target. Invented in the nineteenth century, it comes in three types, classified according to their means of detonation: burning-fuse, the most primitive, first made practical in 1831 by the British; clockwork-fuse, developed in the twentieth century and used extensively in World War II (1939-1945); and chemical-reaction-fuse, the most sophisticated, invented by an Anglo-American team in World War II and common among demolition engineers, terrorists, and saboteurs ever since.

TNT (trinitrotoluene). A high explosive first synthesized in the 1860's but not used as a military explosive until the German armed forces adopted it in 1902 and not extensively used in warfare until World War I (1914-1918). Ideal military explosives are powerful, are nonreactive, are safe to handle, have a long storage life in any climate, and can detonate only under specific conditions. TNT meets all these criteria. The power of nuclear bombs is measured by kiloton, a unit equal to 1,000 tons of TNT, or by megaton, equal to 1 million tons of TNT.

Toledo. A finely tempered, very sharp, elegant steel sword produced in Toledo, Spain. Swords manufactured in this Spanish city have had the reputation for high quality since perhaps as early as the

first century B.C.E. They have been commonly called Toledos since the sixteenth century.

Tomahawk. A small, light ax or hatchet invented in pre-Columbian times, probably by the Algonquins, but carried by most Eastern North American native tribes. Its head was originally stone, but metal after the seventeenth century. It could be either wielded as a hand weapon or thrown. Its name was adopted for one of the best-known cruise missiles.

Torpedo. A naval waterborne antiship missile, either guided or not, launched from a ship, submarine, patrol-torpedo boat, or aircraft, and driven by a propeller. The first practical torpedo, developed by British engineer Robert Whitehead (1823-1905), was invented in Britain in 1866. Earlier, for example in the American Civil War (1861-1865), the word referred to antiship mines. The first extensive use of true torpedoes in war was by the German submarines, U-boats, in World War I (1914-1918). Among the explosives commonly used in torpedo warheads is torpex, a mixture of 42 percent RDX (cyclo-1,3,5-trimethylene-2,4,6-trinitramine), 40 percent TNT (trinitrotoluene), 18 percent aluminum powder, and a tiny bit of wax, developed by the British during World War II (1939-1945).

Tracer bullet. Used in the nineteenth century but developed comprehensively in the twentieth, any projectile, usually from a machine gun and often for antiaircraft fire, either containing or coated with chemicals to produce a visible trail of luminous smoke, especially useful at night to verify the gunner's aim. A variant is the spotter bullet, which contains chemicals to provide a visible flash upon impact. Tracers or spotters can also be armor-piercing or incendiary.

Trebuchet. The largest, most efficient, and most effective of medieval catapults, developed in the thirteenth century and used exclusively as a siege engine. Essentially a first-class lever whose effort was about 20,000 pounds (9,000 kilograms) of rocks in a bucket on the short arm, whose load was a boulder of about 300 pounds (140 kilograms) at the end of the long arm, and whose fulcrum was a massive wooden frame, it had a range of several hundred yards at a medium to high trajectory. Often the throwing arm incorporated a sling to increase the range and velocity of the projectile. As the short arm was very short and the long arm could be up to 50 feet (15 meters), the machine had to be cocked with a complex system of pulleys.

Trident. The ancestor of most pole arms except the pike, evolving from the agricultural pitchfork and at first indistinguishable from it. Intended only for thrusting, its three points created a broad warhead that increased the likelihood of wounding the enemy. It was used in most ancient and medieval wars but is best known as a weapon of Roman gladiators. A later, more sophisticated version is the spetum.

Trireme. A galley with three banks of oars. Developed from the bireme for speed and power around 650 B.C.E. and reaching its height of development during the fifth century B.C.E., it had an overall length between 115 and 130 feet (35-40 meters), a crew of about 170, a draft of only 3 feet (1 meter), and a top oared speed between 9 and 11 knots per hour. Each higher bank of oars was mounted on outrigger fulcrums farther abeam than the next lower bank. Because rowing required precise timing by all crew members, only carefully trained freemen, not slaves, were used, to ensure high morale. By 500 B.C.E., the trireme dominated the Mediterranean.

Troop. A subunit of a cavalry squadron or an artillery battery in the British army roughly comparable to a platoon in the infantry. More recently, when used in the plural form, the term has been popularly used, coupled with a number, to refer to individual soldiers (for example, "25,000 troops" means the same number of soldiers).

Tulwar. A traditional saber of India, characterized by a large, disk-shaped pommel, a knobbed crosspiece at the guard, and a broad, deeply curved blade sharpened along the length of the convex edge. Some varieties had knuckle guards, and many had elaborately engraved or inlaid blades.

Tumen (*tuman* in Arabic). Originally a geographical division of the Mongol Empire that was organized in such a manner as to provide the Mongol

ruler with 10,000 soldiers. Later, the subunit of a Mongol army that had 10,000 soldiers in it. This unit was further divided into the hazara or minghan. The term is still used in the Turkish army to denote a unit of between 6,000 and 10,000 soldiers.

Vanguard. The soldiers who are in a military tactical formation that serves in the front of any army. There is no prescribed number of soldiers that may serve in any vanguard action.

Voulge. A type of pole arm whose head consists of a very large, broad single-edged ax blade with small, sharp spikes or hooks at the top and back. One of the earliest pole arms, it evolved from the ancient pruning hook, a farm tool. The Lochaber ax, the jeddart ax, and the Lucerne hammer all evolved from it.

War hammer. A medieval, especially late medieval, sophisticated, metal-headed, European club, sometimes called a battle-hammer, either a short-handled hand weapon or a pole arm, designed with both a pick head to break armor and a blunt head to cause concussions, trauma, or fractures inside the armor without breaking it.

Wheel lock. A complex muzzle-loading firearm ignition mechanism, invented around 1500. When the trigger was pressed, a wheel turned, opening the pan, creating sparks from friction with iron pyrites, and igniting the powder. It was superseded by the snaphance in the mid-sixteenth century.

Whizbang. A British trench soldiers' onomatopoeic name for a German high-velocity, low-trajectory artillery shell in World War I (1914-1918), usually 88-millimeter. The soldiers believed that if they could hear the "whiz," then the "bang" would not get them.

Xiquipilli. A unit within the Aztec army that consisted of around 8,000 soldiers.

Yataghan. A Turkish short saber without a crosspiece or hand guard. The blade is nearly straight, but in the shape of an S-curve with the edge concave near the hilt and convex near the point.

Yeomanry. During the eighteenth century, volunteer cavalry units in the British army, generally made up of yeomen, freeholders of land, or tenant farmers. Subsequently it became a term for some cavalry units in the British army, and later still for units in the Royal Armoured Corps.

Yuz bashi. A division in the Mongol army, often also called a yaghun, consisting of about 100 soldiers. Ten yuz bashi constituted a ming bashi.

Zeppelin. A rigid airship or dirigible, a steerable lighter-than-air aircraft, as opposed to the blimp, which is nonrigid, and the balloon, which is rudderless. Invented in 1900 by German Count Ferdinand Graf von Zeppelin (1838-1917), it was originally intended for civilian passenger service and performed that function until the *Hindenburg* disaster in Lakehurst, New Jersey, on May 6, 1937. The Germans bombed England by zeppelin during World War I (1914-1918) but abandoned that practice because airships are difficult to defend.

Eric v.d. Luft, updated by Justin Corfield

Military Theorists

Although weaponry has changed substantially, some of the fundamental military tactics remain the same. Essentially generals have learned to choose their own battlefield, if possible, and to disengage if they face inevitable defeat. Over history, various generals have tried to adapt these and other tactics, and theoreticians have refought battles to identify the causes of victory and defeat, as well as plan future strategies. The ancient Daoist general Sunzi wrote the oldest surviving manual on military tactics, and the books by Julius Caesar are the oldest surviving accounts of battles by a commander. The works of Caesar and later Carl von Clausewitz were heavily studied in Europe, and many of the recommendations by all three are still followed, albeit with changes to incorporate new technologies, such as cannons, guns, machine guns, tanks, and aircraft.

Abd el-Krim (Moroccan, 1880-1963): Abd el-Krim led the Rif Revolt against the French and the Spanish, managing to wage an effective guerrilla war against two major European powers with very little outside help.

Afonso de Albuquerque (Portuguese, 1453-1515): Albuquerque employed a system of strategically placed forts to expand Portuguese control of the trade route from the Red Sea along the coasts of India and Indonesia to Macao on the Chinese coast. Eventually Portuguese control was undermined by rival European powers and the Ottoman Empire.

Alexander the Great (Macedonian, 356-323 B.C.E.): Perhaps history's most famous conqueror, Alexander used a well-disciplined army inherited from his father, Philip II (382-336 B.C.E.), to dismantle the vast Persian Empire. Eventually his overreaching exhausted both his troops and himself; he died in Babylon returning from India. Alexander proved that smaller, better-trained armies with motivated troops could consistently defeat larger, more unwieldy forces. When asked to whom he would bequeath his empire, he replied simply to the strongest.

Alfred the Great (Anglo-Saxon, 849-899): The Anglo-Saxon king of Wessex defeated the Vikings on several occasions and established the English navy, which became the Royal Navy, later dominating much of the world from the eighteenth to the early twentieth centuries. He is quoted as saying, "A King's raw materials and instruments of rule are a well-peopled land, and he must have men of prayer, men of war, and men of work."

Ardant du Picq, Charles Jean Jacques Joseph (French, 1821-1870): Killed during the Franco-Prussian War (1870-1871), Ardant du Picq is known for his posthumous work *Études sur le combat: Combat antique et combat moderne* (1880; *Battle Studies: Ancient and Modern Battle*, 1914), which stressed the importance of morale in war. He believed that officers must instill confidence in their troops, especially given the impersonal nature of the modern battlefield. In his book, he stated, "Man does not enter battle to fight, but for victory. He does everything he can to avoid the first and obtain the second."

Ashurnasirpal II (Assyrian, c. 915-859 B.C.E.): As creator of the Neo-Assyrian Empire, Ashurnasirpal established the traditions of military excellence and unrelenting cruelty that made Assyria a dominant and feared power from the Euphrates Valley to the Mediterranean. On one of his inscriptions, he exhorted his armies, "If it pleases, kill! If it pleases you, spare! If it pleases you, do what you will!"

Attila (Hunnic, 406?-453): By uniting all the Hunnic tribes from the northern Caucasus to the upper Danube, Attila led his armies on a swath of con-

quest that took them to the gates of Rome itself. Attila's tactics relied on the speed, skill, and savagery of his troops, as well as the terror they inspired.

Augustus (Roman, 63 B.C.E.-14 C.E.): After defeating Marc Antony at the great Battle of Actium, as first emperor of Rome, following the loss of three legions to German forces in the Teutoburg Forest in 9 C.E., Augustus fixed the boundaries of the Roman Empire along strong defensive lines. Gaius Suetonius Tranquillus, in *De vita Caesarum* (c. 120 C.E.; *History of the Twelve Caesars*, 1606), notes that, obviously fearing mutiny, "he never kept more than three companies on duty at Rome, and even these had no permanent camp, but were billeted in various City lodging houses."

Bayinnaung (Burmese, r. 1551-1581): As king of Burma (now known as Myanmar), Bayinnaung unified the country and made it the most powerful in Southeast Asia, dominating its neighbors and imposing Buddhism throughout the region.

Belisarius (Byzantine, c. 500-565): The greatest of Byzantine generals, Belisarius served on all imperial frontiers as well as crushing the Nika Uprising (532) that nearly toppled the emperor Justinian I (483-565). Belisarius wrested North Africa from the Vandals, conquered Sicily, and expelled the Ostrogoths from southern Italy—victories achieved with probably never more than about 18,000 troops at any one time. In one speech, he is quoted as saying, "Ours is a real enemy in the field; we march to a battle, and not to a review."

Ben Boulaid, Mustapha (Algerian, 1917-1956): Benboulaid served in the French army and then used French tactics against the French during the Algerian War of Independence, coordinating many attacks on that colonial power until his death. The French would withdraw from Algeria four years later.

Bolívar, Simón (Colombian, 1783-1830): Bolívar led the South American independence movement against the Spanish, which saw the formation of Gran Colombia and later the independent nations of Venezuela, Colombia, Ecuador, Peru, Bolivia, and Panama. He is reported to have said, "The army is a sack with no bottom."

Braun, Wernher von (German American, 1912-1977): A pioneer in German rocketry and a visionary of space flight, von Braun helped develop the German rocket program during World War II, which included the V-2, the first large military rocket. After the war he was a key member of the American space program.

Briggs, Sir Harold (British, 1894-1952): In 1950, Briggs devised the plan that bears his name, the Briggs Plan, which allowed the British to win the Malayan Emergency by the establishment of so-called new villages. The success led to the Strategic Hamlets program in South Vietnam, which was a dismal failure.

Bywater, Hector (British, 1884-1940): As a spy in World War I and then as a British diplomat, Bywater recognized the importance of the emerging power of Japan, warning that the Japanese navy could dominate the Pacific during a European war. Most British experts ignored his book *The Great Pacific War* (1925), which, however, was avidly read by the Japanese. In 1920, Maurice Prendergast (who illustrated R. H. Gibson's 1931 *The German Submarine War, 1914-1918*) summed up Bywater's ideas: "Naval policies still appeared to revolve, but in a dull and unnatural manner, round that vacuum where once the German Fleet had existed. The magnetic pole of maritime affairs had not vanished with German sea power; it had only altered its position and required re-discovery."

Cabral, Amilcar (Cape Verdean, 1921-1973): He helped plan the defeat of the Portuguese by training people in Guinea-Bissau against the colonial power, using a trade-and-barter system in parts of the country his forces had taken, and using political ideology as well as nationalism to hold together his supporters.

Caesar, Julius (Roman, 100-44 B.C.E.): A nephew of the Roman general Marius, Julius Caesar rose rapidly in public life and in 60 B.C.E. was elected consul. The following year he was named governor of Cisalpine and Transalpine Gaul and seized the opportunity to conquer the whole of Gaul. Caesar next marched into Italy, precipitating a civil war with his rival, Pompey the Great (106-48 B.C.E.).

In a whirlwind campaign, Caesar pushed Pompey out of Italy, captured Spain, and defeated Pompey at Pharsalus (48 B.C.E.). Master of the Roman world, Caesar was preparing for a campaign against the Parthian Empire when he was assassinated. He was bold to the point of rashness, but his brilliant mind and swift reactions made him master of any battlefield. He recorded his Gallic and civil war campaigns in his *Commentarii de Bello Gallico* (52-51 B.C.E.) and *Commentarii de Bello Civili* (45 B.C.E.), collectively translated as *Commentaries* (1609). Plutarch quotes Caesar as telling his men during the civil war, when sailing from Italy to modern-day Albania, "Go ahead my friends. Be bold and fear nothing. You have Caesar and Caesar's fortune with you in your boat."

Castro, Fidel (Cuban, born 1926): As leader of the Cuban revolutionaries, he not only led his insurgents to victory in Cuba against the Batista government but also proved to be an inspiration to many other Latin American revolutionaries. After his rise to power in Cuba, he supported revolution elsewhere in the world, notably in Angola. A keen reader, he wrote, "When I read the work of a famous author, the history of a people, the doctrine of a thinker, the theories of an economist or the theses of a social reformer, I am filled with the desire to know everything that all authors have written, the doctrines of all philosophers, the treatises of all economists, and the theses of all apostles."

Charlemagne (Frankish, 742-814): King of the Franks and, after 800, Holy Roman Emperor, Charlemagne returned a strategic vision to European warfare. Thanks to an effective system of communications with his subordinate commanders, Charlemagne directed independent campaigns that established a large, relatively stable state in Western Europe.

Chin Peng (Malayan, born 1924): As the leader of the Malayan Communist Party, Chin Peng succeeded in hit-and-run tactics based on heavy use of sympathizers, which nearly caused him to win the Malayan Emergency despite being outnumbered fifty to one. In his memoirs, *My Side of History* (2003), he summed up his strategy: "Our hit-and-run tactics, though more often than not devoid of centralized control, had been successful to the point that public morale on the enemy side had clearly deteriorated. In order to maintain this trend we resolved to hit the British even harder with the specific aim of racking up a higher killing rate among government security forces."

Churchill, John, first duke of Marlborough (English, 1650-1722): During the War of the Spanish Succession (1701-1714), Marlborough made effective use of the allied forces through a blend of battlefield brilliance, logistical thoroughness, and diplomatic skills.

Churchill, Winston S. (British, 1874-1965): A British soldier and politician who planned the ill-fated Gallipoli operation in 1915, Churchill displayed skill and tenacity during World War II, as well as doggedness, which contributed to Britain's triumph in 1945. Although some of his speeches are well known, his determination was best summed up by this famous quotation: "[W]e shall fight on the beaches, we shall fight on the landing grounds, we shall fight in the fields and in the streets, we shall fight in the hills; we shall never surrender. . . ."

Clausewitz, Carl von (German, 1780-1831): Although he served as general in the Prussian army and fought against Napoleon in the Russian campaign of 1812, Clausewitz made his most important contribution when he wrote the posthumously published book *Vom Kriege* (1832-1834; *On War*, 1873). His representation of war as an instrument of the state to coerce an enemy into desired action is often paraphrased as "the continuation of politics by other means." Warfare, therefore, should be guided by political leaders who understand it. Political leaders and generals alike must also recognize what is known as the "Clausewitzian trinity" of violence, chance, and reason, represented in war respectively by the people, the military, and the government. Finally, war brings uncertainty—the "fog of war" and "friction"—in the context of which military decisions must be made and executed. Clausewitz thought commanders should reduce uncertainty, noting that courage and self-confidence are absolutely essential, especially for the general who seeks the most effective way to

victory, that of destroying the enemy army in a single, decisive battle. Initially Clausewitz was regarded as a lesser military thinker, subordinate to his near-contemporary Antoine-Henri Jomini, and some have faulted him for not presenting specific rules or principles for waging war. Although historical and technological changes have made parts of his work less relevant today, Clausewitz remains one of the few essential military theorists in the history of warfare.

Colt, Samuel (American, 1814-1862): Colt invented the revolver that continues to bear his name, a pistol with a rotating cylinder holding six bullets that could all be fired before reloading. It proved a success in the Mexican War (1846-1848), and by 1855 Colt had built the world's largest private gun-making facility in Hartford, Connecticut, where he improved mass manufacturing through the use of assembly lines and interchangeable parts.

Crazy Horse (Native American, 1842?-1877): Chief of the Oglala Sioux, Crazy Horse joined with Sitting Bull (1831-1890) to use mobile warfare to destroy the forces under General George A. Custer (1839-1870) at the Battle of the Little Bighorn (1876). At that battle he rallied his warriors before battle, telling them, "Come on, it is a good day to die!"

Cromwell, Oliver (English, 1599-1658): The eventual commander of the Parliamentarian forces during the English Civil War, Cromwell recognized the importance of training and of professional soldiers through the creation of the New Model Army. He was also to establish an English Republic. After he dissolved the Parliament in 1649, a Presbyterian cleric said to him, "'Tis against the will of the nation: there will be nine in ten against you," to which Cromwell replied, "But what if I should disarm the nine, and put a sword in the tenth man's hand?"

Cyrus the Great (Persian, c. 601 to 590-530 B.C.E.): Founder of the Persian Empire, Cyrus was the world's first great cavalry commander and an expert at siege warfare. His conquests stretched from modern Turkey to the Persian Gulf, and the Greek writer Xenophon quoted him as telling his soldiers, "Remember my last saying: show kindness to your friends, and then shall you have it in your power to chastise your enemies."

Darius the Great (Persian, 550-486 B.C.E.): Darius established a strong central government in Persia with excellent roads and a powerful army. He extended the empire into northern India and conquered Thrace and Macedonia in Europe and Libya in Africa. Around 500 B.C.E., Ionian Greeks revolted, beginning the Greco-Persian Wars (499-448 B.C.E.). Darius died before he could mount his invasion of the Greek mainland.

Dayan, Moshe (Israeli, 1915-1981): As Israel's minister of defense, Dayan's rapid strike at his country's opponents led to victory in the Six-Day War in 1967. In an interview with the British newspaper *The Observer* in 1972, he said, "War is the most exciting and dramatic thing in life. In fighting to the death you feel terribly relaxed when you manage to come through."

Douhet, Giulio (Italian, 1869-1930): Originally an artillery officer, Douhet commanded Italy's Aeronautical Battalion from 1912 to 1915 and became convinced of the superiority of airpower. Like the American William "Billy" Mitchell, Douhet argued with such vehemence that he was court-martialed and forced into retirement. However, Italy's poor performance in World War I brought about his recall. Douhet's *Il dominio dell'aria* (1921; *The Command of the Air*, 1921) argued for an independent air force capable of strategic bombing. In his book, he wrote, "Victory smiles upon those who anticipate the changes in the character of war, not those who wait to adapt themselves after they occur."

Drake, Francis (English, c. 1540-1596): Drake combined the roles of pirate, privateer, and admiral in England's struggle against Spain. He contributed to the tactics of fast, hard-hitting raids on Spanish ports and shipping. His concentration of the English fleet in the western entrance to the English Channel was a key factor in the defeat of the Armada in 1588. Although the most famous statement ascribed to him was made when he was playing bowls and said of the Spanish Armada, "There is time enough to finish the game and beat the Spaniards too," his 1587 letter to Lord Wal-

shingham is more prescient: "There must be a beginning of any great matter, but the continuing unto the end until it be thoroughly finished yields the true glory."

Eisenhower, Dwight D. (American, 1890-1969): Eisenhower oversaw the D day Operation in June, 1944, one of the best-planned and -executed military operations and one of the most difficult yet successful seaborne invasions during World War II. In an address in London in June, 1945, he said, "Humility must always be the portion of any man who receives acclaim earned in the blood of his followers and the sacrifices of his friends."

Epaminondas (Greek, c. 410-362 B.C.E.): Commander of the Theban army at the Battle of Leuctra (371 B.C.E.), Epaminondas defeated a much larger Spartan force by concentrating his forces on his left wing and overwhelming the enemy's right. This use of the "oblique order" was an important development in phalanx warfare. He described the battlefield as "the dance floor of Aries," referring to the god of war.

Eugène of Savoy (French, 1663-1736): Although French-born, Eugène was rejected by King Louis XIV (1638-1715) and became instead an Austrian general and statesman. He was a master of coalition warfare and cooperated successfully with the duke of Marlborough in victories over the French at Blenheim (1704), Oudenarde (1708), and Malplaquet (1709). He wrote, "I never saw better horses, better clothes, finer belts and accoutrements; but money, which you do not want in England, will buy fine clothes and horses, but it cannot buy the lively air I see in every one of these troopers."

Fabius (Roman, c. 275-203 B.C.E.): Called to defend Rome during Hannibal's invasion of Italy, Fabius was nicknamed "the Delayer" for his refusal to meet his Carthaginian opponent in open battle. Instead, he wore down his foes by harassing them in their movements and denying them supplies, a logistical approach to warfare that had great implications for future commanders.

Fisher, John "Jackie" (English, 1841-1920): Fisher revolutionized naval warfare with the introduction of the HMS *Dreadnought* in 1906, the first all-big-gun battleship, which began a new arms race. Fisher instituted other sweeping changes in British naval policy, including concentrating the Royal Navy in home waters for quicker mobilization against a European enemy.

Foch, Ferdinand (French, 1851-1929): A supporter of the offensive and the power of morale, Foch believed a defeat to be final only when an army lost the will to fight. In the last year of World War I, the Allies named Foch as supreme commander, and his positive attitude, along with the arrival of American troops, brought an end to the war. In *Des principes de la guerre* (1903; *The Principles of War*, 1918), he wrote, "A battle won is a battle in which one will not confess himself beaten."

Franco, Francisco (Spanish, 1892-1975): As commander of the Nationalists during the Spanish Civil War, Franco devised a system of war by attrition in which he saw his role as to destroy all opposition in areas captured before advancing any farther. He was to become the longest-serving European dictator during the twentieth century.

Frederick the Great (Prussian, 1712-1786): With the hope of promoting Prussia to great-power status, Frederick relied upon both his superb army and his ability to draw the maximum from his troops. At battles such as Leuthen (1757), he used the famous "oblique order," massing troops on one flank to achieve a decisive local superiority. Even more important was his genius at combining his arms, as at Rossbach (1757). The result was to establish the Prussian army as the most powerful in Europe, a position that remained unchallenged more than a decade after Frederick's death. In one letter, he noted, "The lifetime of one man is not sufficiently long to enable him to acquire perfect knowledge and experience; theory helps to supplement it; it provides youth with early experience and makes him skilful through the mistakes of others." In his *Die Instruktion Friedrichs des Grossen für seine Generale* (1747; *Military Instructions, Written by the King of Prussia, for the Generals of His Army*, 1762; also known as *Instructions for His Generals*, 1944), he noted that "battle is lost less through the loss of men than by discouragement."

Fuller, J. F. C. (British, 1878-1966): During World War I, Fuller planned the Battle of Cambrai (1916-1917), the first to employ tanks. As both an author and an instructor at the British Staff College, he strenuously advocated the extensive use of armor and airpower. In his book *The Reformation of War* (1923), he noted, "I have not written this book for military monks, but for civilians who pay for their alchemy and mysteries. In war there is nothing mysterious, for it is the most commonsense of all sciences."

Genghis Khan (né Temüjin; Mongol, between 1155 and 1162-1227): Genghis Khan united the Mongol tribes and organized the Mongolian army into a powerful force. After his conquests of northern China and central Asia, he established a vast empire that was peaceful, well administered, and strategically positioned. He encouraged trade and opening routes between Europe and China. Genghis Khan's military skill in battle was matched by his attention to organization and administration. His armies were highly disciplined and well supplied. Campaigns were carefully prepared using intelligence gathered by spies and scouts. His reputation and that of his army were his most powerful weapons. He is quoted as saying, "The greatest happiness is to vanquish your enemies, to chase them before you, to rob them of their wealth, to see those dear to them bathed in tears, to clasp to your bosom their wives and daughters."

Geronimo (Native American, 1829-1909): With only a handful of supporters, Geronimo managed to evade capture by the U.S. forces for decades, preventing them from taking control of the Apache lands for much of that period.

Goddard, Robert H. (American, 1882-1945): The "father of modern rocketry," Goddard developed rockets using liquid hydrogen and liquid oxygen as fuels and invented steering systems, multistage rockets, and other technologies that allowed rockets to be used in modern warfare. From 1930 until the mid-1940's, Goddard conducted much of his research in Roswell, New Mexico.

Gribeauval, Jean-Baptiste Vacquette de (French, 1715-1789): As inspector general of French artillery, Gribeauval significantly modernized that military arm. By making cannons bored instead of cast, he improved range, power, and accuracy. His cannons were smaller, lighter, and exceptionally mobile when harnessed to a new design of gun carriage.

Grotius, Hugo (Huigh de Groot; Dutch, 1583-1645): The "father of international law," Grotius developed the first systematic set of laws to govern warfare. His masterpiece, *De iure belli ac pacis libri res* (1625; *On the Law of War and Peace*, 1654), became the foundation for international law regarding the conduct of warfare.

Guderian, Heinz (German, 1888-1954): A combat officer in World War I, Guderian recognized early the value of motorized armor. His book *Achtung-Panzer! Die Entwicklung der Panzerwaffe, ihre Kampfstatik, und ihre operative Möglickeiten* (1937; *Achtung-Panzer! The Development of Armoured Forces, Their Tactics, and Operational Potential*, 1937) outlined the tactics he and other German commanders would use in World War II. He condemned aspects of the Nuremberg war crimes trials in his book *Erinnerungen eines Soldaten* (1950; *Panzer Leader*, 1952), arguing, "All the reproaches that have been leveled against the leaders of the armed forces by their countrymen and by the international courts have failed to take into consideration one very simple fact: that policy is not laid down by soldiers, but by politicians. This has always been the case and is so today."

Guevara, Che (Argentine/Cuban, 1928-1967): Guevara gained legendary status in Cuba after the victory of Fidel Castro in his Cuban Revolution. Guevara planned to extend the revolution to all of Latin America. Although this plan failed and Guevara himself was killed, he proved an inspiration to revolutionaries not only in Latin America but also throughout the world. In his book *La guerra de guerrillas* (1960; *Guerrilla Warfare*, 1961), he noted, "Guerrilla warfare incites no nuclear retaliation. It avoids the troops-cross-border criterion needed to activate our defensive treaties. For the aggressor, guerrilla warfare has none of the heavy costs of all-out warfare. It exploits the Communists' long experience in revolutionary activities.

It can be conducted in countries not contiguous to the Communist land mass. The aggressor merely finds a suitably vulnerable nation, then supplies a few catalysts."

Gustavus II Adolphus (Swedish, 1594-1632): Called the "father of modern warfare," Swedish king Gustavus II Adolphus improved infantry by mixing pikemen and musketeers in battalions. His lighter cannons introduced mobile field artillery that could support infantry on the battlefield. He also reintroduced cavalry, especially heavy cavalry, as a major element in warfare, giving it a critical role to play. Ironically, he was killed leading a cavalry charge in his victory at the Battle of Lützen (1632). His religious beliefs led him to explain in 1632, "My lord God is my armour."

Hadrian (Roman, 76-138): As Roman emperor, Hadrian helped strengthen the borders of the Roman Empire. He is most remembered for the construction of one of the most massive military structures of his time, Hadrian's Wall (c. 122-136 C.E.), in northern England.

Hannibal (Carthaginian, 247-182 B.C.E.): Hannibal was a brilliant battlefield commander, and his victory at Cannae (216 B.C.E.) remains the standard by which all battles are judged. Hannibal's contribution to military theory comes mainly from his invasion of Italy during the Second Punic War. Hannibal cast himself as a "liberator" of the Italian cities and sought to detach them from Rome. When this proved unsuccessful, his unbroken string of tactical victories proved strategically useless. In *Ab urbe condita libri* (c. 26 B.C.E.-15 C.E.; *The History of Rome*, 1600; also known as *Annals of the Roman People*), Livy quoted Hannibal as telling Scipio Africanus just before the Battle of Zama in 202 B.C.E., "It is difficult for a man to whom fortune has never proved false to reflect upon its uncertainties."

Henry V (English, 1387-1422): In his victory at Agincourt in 1415, Henry skillfully employed the long-range firepower of English archers and mobile field fortifications, consisting of sharpened stakes driven into the ground, to defeat a larger army of mounted French knights, thus undermining the basis of traditional feudal military theory. In a play named for him, William Shakespeare has Henry heroically ordering his soldiers at Harfleur, "Once more into the breach dear friends,/ or close up the walls with our English dead."

Heraclius (Byzantine, c. 575-probably 641): Threatened along his borders, Byzantine emperor Heraclius reformed the Byzantine military and administrative system by establishing the "theme system," in which military commanders were placed in complete control of provinces, or "themes."

Hideyoshi, Toyotomi (Japanese, 1537-1598): A peasant who rose to command armies and ultimately Japan itself, Hideyoshi combined military ability, diplomacy, and political skills to unite the island. His career is an excellent example of the interrelated nature of warfare and politics.

Hitler, Adolf (German, 1889-1945): Influenced by his experience in World War I and his own racist views, Hitler believed that Germany must conquer both Western Europe, to gain security, and Eastern Europe, especially the Soviet Union, to secure *Lebensraum*, or "living room," for Germany's population. He was successful in wedding traditional military strategy to this malign political theory and in maintaining the support of the German people and military throughout most of World War II. Hitler was a supporter of new weaponry, such as the Luftwaffe's tactical bombers and fighters, the V-1 and V-2 rockets, and advanced submarines. He also encouraged innovative military techniques such as the Blitzkrieg. In a 1942 speech to the Reichstag, the German parliament, he said of World War II, "This war is one of those elemental conflicts which usher in a new millennium and which shake the world."

Jomini, Antoine-Henri de (French, 1779-1869): A French general, Jomini entered Russian service after being denied a promotion. Jomini's *Précis de l'art de la guerre* (1838; *Summary of the Art of War*, 1868) was a systematic distillation of his thoughts on military science. He emphasized the immutable principles of war and the importance of maneuvering the mass, or main portion, of an army to make it most effective. He thought the mass should be concentrated at the decisive theater of war, threatening the enemy's communica-

tions if possible; that a commander should place the mass of his entire army against a part of his opponent's forces; that the mass of the army should concentrate on the decisive point on the battlefield; and that attacks should be coordinated for maximum impact. Jomini's ideas were highly influential, especially among commanders in the American Civil War (1861-1865). In his book he wrote, "A general thoroughly instructed in the theory of war but not possessed of military coup d'oeil, coolness and skill, may make an excellent strategic plan and be entirely unable to apply the rules of tactics in the presence of an enemy. His projects will not be successfully carried out, [and] his defeat will be probable. If he is a man of character he will be able to diminish the evil results of his failure, but if he loses his wits, he will lose his army."

Juárez, Benito (Mexican, 1806-1872): As leader of the Indians and poor in Mexico, Juárez managed to wage a successful guerrilla war against the Mexican government and then against the Royalists under Emperor Maximilian.

Kangxi (K'ang-Hsi; Chinese, 1654-1722): The fourth emperor of the Qing (Ching) Dynasty (1644-1912), who ruled China from 1669 to 1722, Kangxi consolidated Manchu power and legitimized Manchu rule in China. He defended his realm against incursions from the Russians to the north, seized the island of Taiwan, and overcame a serious internal revolt. In these efforts he made great use of Western technology, particularly cartography and cannons.

Khair ed-Dīn (Ottoman, 1483-1546): Creator of the Ottoman navy, Khair ed-Dīn was also known as Barbarossa because of his red beard. In 1533 Turkish sultan Süleyman I the Magnificent (1494/1495-1566) ordered him to reorganize the imperial navy, a task he accomplished with speed and ability. The new galleys were used in raids on Christendom and in the conquest of Tunis and Nice in France. Khair ed-Dīn used galleys to evacuate the Spanish Moors from Spain in 1533, a task of great logistic complexity. He noted, "He who rules on the sea will very shortly rule on the land also."

Krupp family (German, 1587-1968): The Krupp family was for four centuries the premier weapons manufacturer in Germany and perhaps the world. Alfred Krupp (1812-1887) perfected techniques to manufacture modern weapons and was known as "the cannon king." Krupp guns contributed to Prussia's victory in the Franco-Prussian War (1870-1871) and were important to Germany's efforts in World War I. The Krupp family supported Adolf Hitler, and a second Alfred Krupp helped devise the 88-millimeter gun, one of the most deadly artillery weapons of World War II. In 1968, following financial reverses, the Krupp family left the armaments business.

Lawrence, T. E. (British, 1888-1935): Part military adviser, part visionary, Lawrence directed operations of Arab irregular forces during World War I desert campaigns in 1917 and 1918 and helped the Arabs liberate themselves from the Ottoman Empire.

Lee, Robert E. (American, 1807-1870): Offered command of the Union armies at the start of the American Civil War, Lee sided with his native state of Virginia and rose to command the Army of Northern Virginia. He was noted for his aggressiveness, ever willing to defy military convention and divide his smaller forces in the face of the enemy to achieve a devastating flank attack. At the Battle of Gettysburg (1863), he said, "To be a good soldier, you must love the army. To be a good commander, you must be able to order the death of the thing you love." Later he said to Lieutenant General James Longstreet, "We are never quite prepared for so many to die. Oh, we do expect the occasional empty chair; a salute to fallen comrades. But this war goes on and on and the men die and the price gets ever higher. We are prepared to lose some of us, but we are never prepared to lose all of us. And there is the great trap General. When you attack, you must hold nothing back. You must commit yourself totally. We are adrift here in a sea of blood and I want it to end. I want this to be the final battle."

Lettow-Vorbeck, Paul von (German, 1870-1964): As commander of the German forces in Tanganyika (now Tanzania), Lettow-Vorbeck developed

a system of guerrilla warfare that allowed him to avoid defeat by the British throughout World War I. In his memoirs, *Meine Erinnerungen aus Ostafrika* (1920; *My Reminiscences of East Africa*, 1920; also known as *East African Campaigns*, 1957), he wrote, "There is almost always a way out, even of an apparently hopeless position, if the leader makes up his mind to face the risks."

Liddell Hart, Basil Henry (British, 1895-1970): Liddell Hart's contributions to military theory include his concept of the "expanding torrent" of armed forces through the enemy's line, which was a precursor of the later German Blitzkrieg. He also advocated attacking key aspects of the enemy's civilian sector. In 1929, he wrote in the *Encyclopedia Britannica*, "In war, the chief incalculable is the human will." In his *Thoughts on War* (1944), he noted, "Those who are naturally loyal say little about it, and are ready to assume it in others. In contrast, the type of soldier who is always dwelling on the importance of loyalty usually means loyalty to his own interests."

Louvois, marquis de (French, 1639-1691): As war minister under Louis XIV, Louvois strengthened the French army, making it possible for Louis to wage his numerous wars. Louvois also supported Sébastien Le Prestre de Vauban and others who helped modernize the French military.

Lumumba, Patrice (Congolese, 1925-1961): Trained in Moscow, Lumumba led the Congolese to independence from Belgium and became a hero to many African revolutionaries.

MacArthur, Douglas (American, 1880-1964): From a family of career soldiers, MacArthur was defeated in the Philippines by the Japanese in early 1942 but became the author of the island-hopping strategy that would lead to the defeat of Japan in August of 1945. He later commanded U.S. forces (and others serving as part of the United Nations) in the Korean War. At the Republican National Convention in 1952, he said, "It is fatal to enter any war without the will to win it."

Machiavelli, Niccolò (Italian, 1469-1527): Best known for *Il principe* (1532; *The Prince*, 1640), Machiavelli also wrote *Dell'arte della guerra* (1521; *The Art of War*, 1560). Machiavelli looked to Republican Rome to argue that a truly stable and secure nation required a disciplined, well-trained citizen army instead of mercenaries. Machiavelli directly linked politics and war, anticipating the simplification of Carl von Clausewitz that "war is the continuation of politics by other means." *The Art of War* was held in high regard by readers such as Frederick the Great, Napoleon, and Clausewitz. Machiavelli wrote from experience: He drafted the Florentine *Ordinanza* of 1505, a military law to end use of mercenary troops. In *The Art of War*, he wrote, "It is better to subdue an enemy by famine than by sword, for in battle, *fortuna* has often a much greater share than *virtu*."

Maginot, André (French, 1877-1932): Maginot, French minister of defense, advocated the building of forts on France's eastern border to protect France from invasion by Germany. Built during the 1930's, these became known as the Maginot line during World War II.

Mahan, Alfred Thayer (American, 1840-1914): An American naval officer, Mahan published *The Influence of Sea Power upon History, 1660-1783* in 1890, arguing that sea power was the decisive factor in national strength. *The Influence of Sea Power upon the French Revolution and Empire, 1793-1812* (1892) extended and solidified his influence. Both books were widely read and studied in Great Britain and Germany prior to World War I and contributed to the naval arms race, which helped spark that conflict. In his book *Naval Strategy Compared and Contrasted with the Principles and Practices of Military Operations on Land* (1911), he wrote, "Where evil is mighty and defiant, the obligation to use force that is war arises."

Mahan, Dennis Hart (American, 1802-1871): Instructor at West Point and writer, Mahan published editions of his *An Elementary Treatise on Advanced-Guard, Out-Post, and Detachment Service of Troops and the Manner of Posting and Handling Them in Presence of an Enemy* in 1847, 1853, and 1863. *Out-Posts*, as it came to be known, was a comprehensive review of strategy and tactics. Mahan helped teach Civil War generals to be-

lieve in an active offensive campaign of maneuver as a means of victory. He wrote, "How different is almost every military problem except in the bare mechanism of tactics. In almost every case the data on which a solution depends is lacking."

Mao Zedong (Mao Tse-tung; Chinese, 1893-1976): As a military and revolutionary theorist, Mao believed that the countryside, not the city, was the seedbed of a people's revolution. He stated that "political power comes out of the barrel of a gun" and that "all reactionaries are paper tigers." He advocated a small but dedicated revolutionary force that would move among the general population until it could seize total control of the nation. His most famous comments on fighting were published in *Six Essays on Military Affairs* (1971).

Marius, Gaius (Roman, 157-86 B.C.E.): Gaius Marius was the prime mover behind the second century B.C.E. evolution of Roman armies from groups of citizens serving for limited periods to standing armies raised and paid by their commander, to whom they were therefore loyal. He also instituted the cohort as the principal unit of the Roman army and improved training and discipline. In one battle, his opposing commander is said to have claimed, "If you are a great general, come down and fight me," to which Marius replied, "If you are a great general, come and make me fight you."

Maurice of Nassau (Dutch, 1567-1625): Commander of the Dutch forces in their revolt against Spain, Maurice introduced drill, discipline, organization, standardized equipment, and clear command structure. He drew upon classical examples to make his troops more flexible and responsive, and he effectively utilized artillery and engineers.

Maxim, Hiram Stevens (British, 1840-1916): Born in the United States, Maxim became a British subject in 1900. He invented the automatic machine gun, the basis for one of the most important of modern weapons.

Mehmed II (Ottoman, 1432-1481): The sultan Mehmed II completed the defeat of the Byzantine Empire with the Siege of Constantinople (1453), in which he used the largest cannons yet known, specifically cast for the purpose. After capturing Constantinople, he famously is reported to have said, "The city and the buildings are mine, but I resign to your valor the captives and the spoil, the treasures of gold and beauty; be rich and be happy."

Minié, Claude-Étienne (French, 1804-1879): In 1849, Minié, a French officer, invented a bullet with a conical point and an iron cup at the bottom. When the "Minié ball" was fired from a muzzle-loading rifle, the cup caused the bullet to expand and fit snugly against the rifling grooves of the barrel, increasing the accuracy. The Minié ball was quickly adopted by Western armies.

Mitchell, William "Billy" (American, 1879-1936): An advocate of airpower in armed forces and of the creation of a separate air force, Mitchell commanded the U.S. Army Air Service in Europe during World War I. He was a friend of British air corps commander Hugh Trenchard, an equally strong proponent of airpower. Mitchell's forceful arguments that airpower would be the decisive factor in warfare and his attacks on his superiors led to his court-martial and resignation. In his book *Winged Defense: The Development and Possibilities of Modern Air Power—Economic and Military* (1925), he noted, "It is probable that future war will be conducted by a special class, the air force, as it was by the armored knights of the Middle Ages."

Monash, John (Australian, 1865-1931): As a commander in World War I, Monash oversaw the broad attack at Villers-Bretonneux in 1918 that forced the German to retreat, the first major defeat for the Germans after four years of trench warfare. In spite of his success in the war, he did say, "I do not regard and have never regarded permanent soldiering as an attractive proposition for any man who has some other profession at his command. I would recommend to him to stick to private practice every time."

Napoleon I (Napoleon Bonaparte; Corsican French, 1769-1821): Napoleon's rise from a position of relative obscurity to that of French emperor in 1804 and his final defeat at Waterloo (1815) and ensuing exile to the barren island of St. Helena are romantic aspects of his life. His reputation rests solidly on his reforms of the French legal and ad-

ministrative system and, especially, his military genius. Napoleon inherited an army that had made major improvements in artillery, infantry tactics, and organization, and he incorporated these into a coherent system that improved the army's logistics, speed, and fighting power. He evolved a command system that allowed him to control operations in an extensive battlefield so he could menace one portion of an enemy's line and at the decisive moment strike at the most vulnerable point. With this flexibility, he won complex battles at Castiglione (1796) and Austerlitz (1805), both of which relied upon careful timing. Above all, Napoleon brought a vision to warfare that moved beyond the immediate battle to a strategic plan to win the war. He commented, "In war, everything depends on morale; and morale and public opinion comprise the better part of reality."

Nasution, Abdul Haris (Indonesian, 1918-2000): This Indonesian general developed the concept of territorial warfare and also the tactics of guerrilla warfare against the Dutch during the Dutch-Indonesian War. In his book *Pokok-Pokok Gerilya* (1953; *Fundamentals of Guerilla Warfare*, 1953), he argued, "The guerrilla should be a revolutionary vanguard; this was our ideal in the past and should be our ideal in the future."

Nelson, Horatio (British, 1758-1805): During the Napoleonic Wars (1793-1815), Nelson's victories at the Battle of the Nile (1798), Copenhagen (1801), and Trafalgar (1805) ensured English naval domination. Nelson's tactics, never formalized and always open to innovation, consisted of breaking the line of enemy ships and then concentrating on the scattered elements. At the Battle of Trafalgar, he noted, "England expects every man to do his duty."

Nimitz, Chester W. (American, 1885-1966): Commander in chief of the United States Pacific fleet during World War II, Nimitz used an "island-hopping" strategy that seized key points and left Japanese forces isolated. He combined airpower and military intelligence to win the decisive Battle of Midway in 1942. In March, 1945, he noted of his soldiers, "Among the men who fought on Iwo Jima, uncommon valor was a common virtue."

Oppenheimer, J. Robert (American, 1904-1967): As director of the Los Alamos Laboratories during World War II, Oppenheimer was in charge of the team of scientists who developed the nation's first nuclear weapons, a program called the Manhattan Project. An excellent administrator as well as a scientist, he also was a member of the scientific panel that supported the use of the atomic bomb against Japan.

Philip II (Macedonian, 382-336 B.C.E.): As king of a marginal state on the edge of the Greek world, Philip transformed the Macedonian army into his era's most potent force, largely through effective use of the military formation known as the phalanx. He was preparing an invasion of the Persian Empire when he was assassinated by a Macedonian youth. He was then succeeded in rule, ambition, and achievement by his son, Alexander the Great, who would go on to conquer much of the known world.

Qi Jiguang (Ch'i Chi-Kuang; Chinese, 1528-1587): Qi Jiguang incorporated the precepts in Sunzi's (Sun Tzu's) *Bingfa* (c. 510 B.C.E.; *The Art of War*, 1910) in reforms that allowed large Chinese armies to cross the steppes and fight against mounted, more mobile opponents. He thereby made China a more unified and stable nation.

Saladin (Seljuk Turk, c. 1137-1193): As leader of the Seljuk Turks, he led his troops to victory at the Battle of Hattin, and he managed to destroy the Kingdom of Jerusalem, and blunt the Third Crusade, holding together an Empire which included modern-day Egypt, Syria, Iraq, Saudi Arabia, and Yemen.

San Martín, José (Argentine, 1778-1850): San Martín managed to rally Latin Americans who supported independence from Spain, lead them across the Andes, and attack Spanish-dominated Peru, thereby ensuring independence for Argentina, Chile, and Peru.

Schlieffen, Alfred von (German, 1833-1913): The German chief of staff from 1891 to 1905, Schlieffen devised an intricate plan for Germany to strike first against France and then move against the slower Russian armies. The plan was the supreme example of war by timetable and went through

more than fifty revisions. When war finally came, however, it failed.

Schwarzkopf, H. Norman (American, born 1934): Schwarzkopf oversaw the victory of the U.S.-dominated coalition forces in the Gulf War of 1991 with relatively few casualties. His role was not only to lead a sometimes uneasy coalition but also to use the media to make the Iraqis believe that he was about to launch a seaborne invasion instead of attacking on land. In an interview in 1991, he said, "It is very important that if we commit again to any kind of battle we are sure to understand the ramifications of what happens if we do accomplish our objectives," an observation that appeared prescient following the U.S.-led invasion of Iraq mounted in 2003.

Scipio Africanus (Roman, 235-183 B.C.E.): During the Punic Wars, Scipio Africanus managed to defeat Hannibal by embarking on a risky invasion of North Africa and forcing the Carthaginians to leave Italy in order to save their capital. His dislike of politicians was shown when he was later tried for bribery. Warning the Roman people against politicians, Scipio exclaimed, "Ungrateful country, you will not possess even my bones."

Scott, Winfield (American, 1786-1866): A veteran of the War of 1812, a victor in the Mexican War (1846-1848), and a long-serving army commander, Scott instilled professionalism in the new American nation's army. His amphibious expedition against Mexico in 1847 used maneuvering more than frontal assault to achieve victory. In 1861, in his mid-seventies, he proposed the Anaconda Plan, which eventually defeated the Southern Confederacy by blockade, driving down the Mississippi River into the heart of the South.

Servius Tullius (Roman, 578-534 B.C.E.): Servius was a possibly fictitious Etruscan king credited with revising the Roman state, including its military. His army was organized around "centuries" of one hundred men capable of providing their own arms and armor. Servius is said to have built the first walls around Rome, the first bridge across the Tiber, and Rome's seaport at Ostia. During his reign (or during this time), Rome emerged as the leading power in central Italy.

Severus, Lucius Septimius (Roman, 146-211): Severus restored military strength to the Roman Empire after a period of civil war. He increased the number of Roman legions, created a mobile reserve, used native troops, and tied the army to the throne by increased pay. His dying words to his sons were, in effect, "Be generous to the soldiers and don't care about anyone else."

Shaka (Zulu, c. 1787-1828): Founder of the Zulu Empire in southern Africa, Shaka introduced the *assagai*, or the short stabbing spear, and organized disciplined units that could be effectively commanded on the battlefield. The empire he founded resisted European control until 1897.

Sherman, William Tecumseh (American, 1820-1891): The commander of Union armies in the western theater during the American Civil War, Sherman declared that "war is hell and you cannot refine it," believing that the morale of an enemy civilian population was as much a target as its armies in the field. He employed this doctrine during his devastating March to the Sea (1864) and his subsequent advance across the Carolinas. Looking back on the war, in 1880 he said, "There is many a boy here to-day who looks on war as all glory, but, boys, it is all hell."

Shihuangdi (Shih Huang-ti; Chinese, 259-210 B.C.E.): The first emperor (also known as Qin Shihuangdi) to rule a unified China, Shihuangdi came to power in 246 B.C.E. as ruler of Qin (Ch'in), a feudal state that unified China in 221 B.C.E. He centralized government and military administration. He divided the country into thirty-six military districts and standardized weights, measurements, and even the axle lengths of carts to make roads more uniform. He built much of the Great Wall.

Shrapnel, Henry (British, 1761-1842): An English artillery officer, Shrapnel developed an artillery projectile with many small metal pieces. When exploded, these were effective against enemy troops. The name for his device, first used in 1804 and known as "shrapnel," has come to be used for similar fragments from artillery shells or bombs.

Skanderbeg (Albanian, 1405-1468): As prince of Albania, Skanderbeg was able to lead a spirited

resistance against the Ottoman Turks for two decades, developing a system of hit-and-run raids yet managing to maintain some strategic strongholds.

Slim, Viscount (Sir William Slim; British, 1891-1970): A commander of guerrilla groups harassing the Japanese in Burma (now called Myanmar) in World War II, Viscount Slim noted in 1957, in *Courage and Other Broadcasts,* "The more modern war becomes, the more essential appear the basic qualities that from the beginning of history have distinguished armies from mobs."

Sunzi (Sun Tzu; Chinese, fl. c. fifth century B.C.E.): Little is known about the author of *Bingfa* (c. 510 B.C.E.; *The Art of War*, 1910) except that he was active in military affairs during the Zhou (Chou) Dynasty (1066-256 B.C.E.) and had a profound influence on Asian military thought. He was largely unknown in the West until the eighteenth century, and he received widespread appreciation only in the twentieth. Sunzi stressed moral more than physical force, seeing defeat as a psychological condition that a successful commander imposes upon an opponent. A proponent of Daoist thought, Sunzi preached that a commander must use the natural flow of conditions—terrain, weather, enemy strength, and morale—to shape the battle plan. To dominate an enemy morally, one must understand the enemy completely, necessitating the use of intelligence gathering, deception, and trickery. In Sunzi's concept of warfare, the ultimate goal is to make the enemy's plans fit one's own strategy so that his strengths become weaknesses and lead to his ultimate defeat. A quote he ascribed to Wu Ch'i was "The troops must have confidence in the orders of their seniors. The orders of their superiors [form] the source whence discipline is born."

Templer, Gerald (British, 1898-1979): As commander of the British in Malaya, Templer managed to use intelligence and strong-arm tactics to win the Malayan Emergency, in one of the most successful counterinsurgency campaigns in the twentieth century. When asked how he won the conflict, he said, "It all depended on intelligence."

Themistocles (Greek, c. 524-c. 460 B.C.E.): After the Greek victory over the Persians at Marathon (490 B.C.E.), Themistocles established a strong Athenian navy. In 480 B.C.E., the combined Greek fleet defeated the Persians at Salamis. Although Themistocles was exiled from Athens, he laid the foundation for the Athenian Empire.

Thompson, Robert (British, 1916-1992): A leading British counterinsurgency expert, Thompson advised the British military in Malaya and later the Americans in Vietnam. He started his book *No Exit from Vietnam* (1969) by noting that war as a continuation of politics is comprehensible only in relation to the achievement of its political aim.

Tiglath-pileser III (Assyrian, r. 745-727 B.C.E.): Assyrian ruler Tiglath-pileser III established a strong, centralized government and army that allowed the Assyrian Empire to conquer Syria, Phoenicia, Israel, and much of the Middle East.

Tito (Josip Broz; Yugoslav, 1892-1980): As leader of the Partisans, Tito managed to defeat the Germans in Yugoslavia and outmaneuver the Yugoslav Royalists. In 1942 he wrote that success would come from "swift, surprise assaults, night forays, surrounding the enemy and regularly attacking him from the rear."

Torstenson, Lennart (Swedish, 1603-1651): A Swedish general and artillery commander, Torstenson served under Gustavus II Adolphus and was expert in the use of the new mobile field artillery. After rising to the command of the Swedish army in 1641, he won a series of victories that relied on his skillful use of field artillery.

Trenchard, Hugh (British, 1873-1956): After serving in the British Army, Trenchard became the Royal Flying Corps' field commander in 1913. In 1918 he established the Independent Air Force as a separate branch. He supported strategic bombing and instituted its first use against Germany in the closing days of the war.

Trotsky, Leon (Russian, 1879-1940): Known as a political leader of the Bolshevik Revolution (1917-1921), Trotsky was the creator of the Red Army during the Russian Civil War (1918-1921). As the first modern military force motivated and guided by ideology, the Red Army preserved the

Soviet revolutionary government against its internal and external enemies. In 1921, Trotsky wrote, "If we happen to be too weak for attack, then we strive to detach ourselves from the embraces of the enemy in order later to gather ourselves into a gist and to strike at the enemy's most vulnerable spot." This and other comments were published as *Military Writings* (1969). As his long-term strategy, he noted, "First of all you must build the morale of your own troops. Then you must look to the morale of your civilian population. Then, and only then, when these are in good repair, should you concern yourself with the enemy morale. And the best way to destroy the enemy morale is to kill him in large numbers. There is nothing more demoralizing than that."

Tsuji, Masanobu (Japan, 1902-1961): Tsuji was a Japanese army officer who helped plan the invasion of Malaya, oversaw the war in Malaya, and later served in Burma and Guadalcanal. His book *Shingapōru: Unmei no tenki* (1952; *Singapore: The Japanese Version*, 1960) is one of the few accounts in English by a senior Japanese officer. He noted famously, "Patience is a virtue in staff discussions."

Vauban, Sébastien Le Prestre de (French, 1633-1707): Vauban is chiefly remembered as Europe's best and most prolific military engineer at a time when siegeworks and fortifications were crucial to the art of military affairs. He developed a system of geometric, angular, defensive works that were mutually reinforced by firepower and difficult to attack. Vauban was equally adept using counterwalls or circumvallations; indirect approaches, such as zigzagging trenches; and explosives, such as mines, in capturing enemy fortresses.

Vegetius Renatus, Flavius (Roman, fifth century C.E.): Vegetius's *De Re Militari* (383-450 C.E.; *The Fovre Bookes of Flauius Vegetius Renatus: Briefelye Contayninge a Plaine Forme and Perfect Knowledge of Martiall Policye, Feates of Chiualrie, and Vvhatsoeuver Pertayneth to Warre*, 1572; also translated as *Military Institutions of Vegetius*, 1767) provided an excellent description of Roman infantry doctrine, especially its emphasis on drill and maneuver. This work was consulted as a practical manual on military matters well into the nineteenth century.

Vo Nguyen Giap (Vietnamese, born 1911): Viet Minh general Giap believed revolutionary warfare should follow a three-step progression: guerrilla fighting, equality with the opponent, and final victory. During the long struggle in Vietnam, he employed this strategy against the French, South Vietnamese, and Americans, leading to military victories, such as that at Dien Bien Phu in 1954, as well as politically beneficial military defeats, such as the 1968 Tet Offensive. Commenting on his military tactics, in 1982 he said famously, "There is only one rule in you: you must win."

Wallenstein, Albrecht Wenzel von (Bohemian, 1583-1634): As a general in the forces of the Holy Roman Empire during the Thirty Years' War (1618-1648), Wallenstein raised his own armies and provided for them from the lands of his opponents. His maxim was that "war must feed war."

Washington, George (American, 1732-1799): As commander of the American forces during the American Revolution, Washington transformed the militia into the Continental Army after training them at Valley Forge. In 1796 he stated, "It is our true policy to steer clear of permanent alliance with any portion of the foreign world."

Weinberger, Caspar (American, 1917-2006): As U.S. secretary of defense (1981-1987), Weinberger oversaw the massive expansion of the U.S. military, including nuclear submarines, that prompted the Soviet Union to compete, bankrupting itself in the process. In 1990 he published an account of his time in the Pentagon, *Fighting for Peace: Seven Critical Years in the Pentagon*.

Wellington, duke of (Arthur Wellesley; British, 1759-1852): As commander of the British forces in the Peninsular War and then at Waterloo, Wellington invoked planning, shrewdness, and conservatism to achieve many victories against Napoleon. In 1810 he said of the French, "They won't draw me from my cautious system. I'll fight them only where I am pretty sure of victory."

Wet, Christiaan de (South African, 1854-1922): As commander of the Boer guerrillas, de Wet was

able to wage a long war against a massively superior British army during the Second Boer War. In his book *De strijd tusschen Boer en Brit* (1902; *Three Years' War*, 1902), he said, "[W]e had always felt that no one is worthy of the name of man who is not ready to vindicate the right, be the odds what they may."

Whitney, Eli (American, 1765-1825): American inventor Whitney perfected the manufacture of interchangeable parts in 1798, standardizing the machine-made parts of a musket to predetermined specifications and bringing mass production to warfare.

Yamamoto, Isoroku (Japanese, 1884-1943): Japan's most successful admiral during World War II, Yamamoto devised the surprise attack on Pearl Harbor. He forced the "decisive battle" with the American fleet at Midway; the American victory there was the turning point in the Pacific war. In 1937 he urged that "Japan should never be so foolish as to make enemies of Great Britain and the United States."

Yi Sun-sin (Korean, 1545-1598): Yi developed probably the first ironclad battleship, the *kobukson* or "turtle ship," whose upper deck was covered with iron plates and with cannons mounted along the sides and stern. When the Japanese invaded Korea in 1592, Yi's fleet cut them off from supplies and reinforcements. His naval victories are ranked with those of the Battle of Lepanto (1571) and the defeat of the Spanish Armada (1588).

Zhukov, Georgy (Soviet, 1896-1974): A Red Army commander during World War II, Zhukov earned a reputation for tenacity and planning, which led to the destruction of the Axis forces at Stalingrad and later their defeat in Europe.

Žižka, Jan (Bohemian, c. 1360-1424): Military leader of the Hussites, Žižka used linked, stoutly built wagons filled with troops and small cannons as mobile field fortifications known as Wagenburgs. Žižka was never defeated in battle, despite the fact that he was, for much of his life, blind.

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Michael Witkoski, updated by Justin Corfield

Time Line

c. 13,000 B.C.E.	Spears and spear-throwers appear as weapons.
c. 10,000 B.C.E.	Bows and arrows appear as weapons in Neolithic cave paintings.
c. 9th millen. B.C.E.	The sling makes its first known appearance.
c. 7000 B.C.E.	The inhabitants of Jericho construct massive fortifications around their city.
c. 7th millen. B.C.E.	The stone-headed mace makes its first known appearance.
c. 5000 B.C.E.	The city of Jericho becomes arguably the first town to be fortified with a stone wall.
c. 5000 B.C.E.	Sailing ships make their first appearance in Mesopotamia.
c. 4000 B.C.E.	Horses are first domesticated and ridden by people of the Sredni Stog culture.
c. 4000 B.C.E.	Copper is used to make the first metal knives, in the Middle East and Asia.
c. 3500 B.C.E.	The Sumerians employ wheeled vehicles.
c. 3200 B.C.E.	The Bronze Age is inaugurated in Mesopotamia as new metal technology allows more lethal weapons and more effective armor.
c. 2500 B.C.E.	The Sumerian phalanx is first employed.
c. 2500 B.C.E.	Metal armor is developed in Mesopotamia, making the stone-headed mace obsolete.
2333 B.C.E.	The emergence of King Tangun, who establishes what becomes Korea.
c. 2300 B.C.E.	After the composite bow is introduced by Sargon the Great, the use of the Sumerian phalanx declines.
c. 2250 B.C.E.	The composite bow is depicted in Akkadian Stela of Naram-Sin.
c. 2100 B.C.E.	The Sumerians reassert their supremacy over southern Mesopotamia, precipitating a renaissance of Sumerian culture and control that lasts for approximately two hundred years.
c. 2000 B.C.E.	The first metal swords, made from bronze, appear.
c. 1950-1500 B.C.E.	Assyrians first rise to power during the Old Empire period.
c. 1900 B.C.E.	Primitive battering rams are depicted in Egyptian wall paintings.
c. 1810 B.C.E.	Neo-Babylonian leader Hammurabi unifies the Mesopotamian region under his rule and establishes a capital at the city-state of Babylon.
c. 1800-1000 B.C.E.	Aryan invaders conquer India, mixing with earlier cultures to produce a new Hindu civilization in the area of the Ganges River Valley.

c. 1700 B.C.E.	Assyrians employ integrated siege tactics with rams, towers, ramps, and sapping.
c. 1674 B.C.E.	The Hyksos people introduce the horse-drawn chariot during invasions of Egypt.
c. 1600 B.C.E.	Chariot archers are increasingly used in warfare.
1600-1066 B.C.E.	The Shang Dynasty rules in China.
c. 1500-900 B.C.E.	During their Middle Empire period, the Assyrians drive the Mitanni from Assyria, laying foundations for further expansion.
1469 B.C.E.	At the Battle of Megiddo, the first recorded battle in history, the ancient Egyptians win a resounding victory against their opponents.
1400-1200 B.C.E.	Mycenaean civilization flourishes, with a wealth of political, economic, and religious centers.
c. 1384-1122 B.C.E.	The crossbow is originated during China's Shang Dynasty.
c. 1300 B.C.E.	Chariot design undergoes major innovations, with an increase in the number of spokes and the relocation of axles.
c. 1300-700 B.C.E.	Semitic desert dwellers infiltrate southern Mesopotamia to establish Chaldean culture during a period of Assyrian domination in the Near East.
c. 13th cent. B.C.E.	The Hebrews conquer Transjordan and Canaan under the leadership of Joshua.
1274 B.C.E.	At the Battle of Kadesh, the Egyptian Pharaoh uses massed chariots against the Hittites, wining a great victory in spite of his opponents' possession of iron weapons against the Egyptian soldiers, who are armed with bronze ones.
c. 1200 B.C.E.	The use of the chariot in warfare declines and foot soldiers increasingly come into use, as "barbarian" tribes, fighting on foot and armed with javelins and long swords, overrun many ancient Middle Eastern kingdoms.
c. 1200 B.C.E.	The chariot is introduced to China from the northwest and is later adapted for use in siege warfare.
1200-1100 B.C.E.	The Mycenaean order collapses during a period of upheaval.
c. 1200-1100 B.C.E.	The fortified city of Troy is besieged by the Greeks for ten years, with many leaders on both sides involved in single combat. The city falls only after succumbing to the Greek deception tactic of the Trojan horse placed outside the city's gates.
c. 1122 B.C.E.	Shang Dynasty armies introduce the chariot to northern China in warfare against the Zhou (Chou) Dynasty.
1100-750 B.C.E.	In the period known as the Greek Dark Age, petty chieftains replace the Mycenaean kings.
1066-256 B.C.E.	The Zhou Dynasty rules in China.
c. 1000 B.C.E.	Metal-headed maces become common in Europe.
c. 1000 B.C.E.	Cimmerians first produce bronze battle-axes.

c. 1000 B.C.E.	Iron begins to replace bronze in the making of weapons in Assyria.
1000-990 B.C.E.	David consolidates the reign of Judah and Israel and defeats neighboring kingdoms of Moab, Edom, Ammon, and Aramaea, among others.
c. 1000-600 B.C.E.	The Aryan Hindu civilization comes to dominate most of northern and central India while smaller states wage war for control in the southern region of the subcontinent.
c. 900 B.C.E.	Cavalry begins to compete with chariotry as a method of warfare in the Neo-Assyrian Empire.
c. 900 B.C.E.	Scyths and succeeding steppe warriors master the use of bows while on horseback.
c. 900 B.C.E.	Iron weapons become increasingly popular. Smiths master the use of iron to make stronger, more lethal swords.
900-600 B.C.E.	Assyria undergoes its Late Empire period, its greatest era of military expansion.
850 B.C.E.	The principles of fortress building are evidenced in an Assyrian relief sculpture.
753 B.C.E.	The city of Rome is said to be founded on the banks of the Tiber River by Romulus, one of the twin sons of Mars, the Roman god of war.
c. 750-650 B.C.E.	Hoplite armor and tactics are developed.
745-727 B.C.E.	After years of domestic turmoil, Tiglath-pileser III reestablishes control over Assyrian homeland and institutes military reforms.
721 B.C.E.	Sargon II conquers Israel.
705-701 B.C.E.	Judean king Hezekiah leads a rebellion against Assyrian domination.
c. 700 B.C.E.	Tight-formation hoplite tactics, well suited to the small plains of the ancient Greek city-states, are first introduced in Greece.
c. late 7th cent. B.C.E.	The Greeks develop the trireme, a large ship powered by three rows of oarsmen.
626 B.C.E.	Nabopolassar Nebuchadnezzar leads a revolt against Assyrian rule and establishes the Chaldean (Neo-Babylonian) kingdom.
612 B.C.E.	The Assyrian city of Nineveh is conquered by Medes and Babylonians, marking the final destruction of the Assyrian Empire.
c. 6th cent. B.C.E.	The lance is first used by the Alans and Sarmatians, and the chariot is first used by various tribes in battle.
587 B.C.E.	Jerusalem falls to the Neo-Babylonians.
587-586 B.C.E.	Nebuchadnezzar II uses siege warfare to conquer Jerusalem.
c. 546 B.C.E.	Persian king Cyrus the Great uses chariots to great advantage at the Battle of Thymbra.
539 B.C.E.	The Chaldean Empire is conquered by Persian king Cyrus the Great.
c. 510 B.C.E.	Sunzi writes his classic work *Bingfa* (*The Art of War*).

c. 5th cent. B.C.E.	The crossbow is developed in China; it provides more power, speed, and accuracy than the composite bow.
c. 5th cent. B.C.E.	Athens establishes itself as a major naval power in the Mediterranean.
c. 5th cent. B.C.E.	The Republican Revolt in Rome leads Horatius and two others to hold back a large Etruscan army as the bridge over the River Tiber is destroyed.
499-448 B.C.E.	The Persian Wars are fought between Persia and the Greek city-states.
480 B.C.E.	The Persians advance into Greece, but their massive force is held back at Thermopylae and their navy is later defeated at Salamis.
431-404 B.C.E.	The Peloponnesian Wars are fought between Athens and Sparta.
c. 429-427 B.C.E.	A wall of circumvallation is used in the Siege of Plataea by Sparta and Thebes at the beginning of the Peloponnesian War.
c. 401 B.C.E.	Slings are used to great effect against the Persians at the Battle of Cunaxa, outranging Persian bows and arrows, and charioteers are overwhelmed by more flexible cavalry, ending the dominance of chariots in warfare.
c. 400 B.C.E.	The development of the *gastraphetes*, or belly bow, allows the shooting of more powerful arrows.
c. 4th cent. B.C.E.	The earliest known stirrups, made from leather or wood, are used by the Scyths.
c. 4th cent. B.C.E.	Onboard catapults are added to ships, effectively rendering them as floating siege engines.
c. 4th cent. B.C.E.	The *Arthaśāstra* (*Treatise on the Political Good*), an influential treatise on Indian politics, administration, and military science, is reputedly written by the prime minister Kauṭilya.
c. 4th-3d cent. B.C.E.	Mediterranean city-states undertake the building of massive walls during a period of warfare.
c. 4th-3d cent. B.C.E.	Protective bone breastplates are used regularly.
c. 399 B.C.E.	The catapult is invented at Syracuse under Dionysius I, significantly advancing the art of siege warfare.
c. 390 B.C.E.	Gallic warriors overwhelm the Republic's forces, capturing and plundering the city of Rome.
371 B.C.E.	Thebes defeats Sparta at Leuctra, ending Spartan supremacy in hoplite warfare.
c. 350 B.C.E.	Philip II of Macedon develops the Macedonian phalanx and adopts the use of the sarissa, a pike nearly 15 feet long and wielded with two hands.
338 B.C.E.	Philip II of Macedon defeats a united Greek army at Chaeronea.
334 B.C.E.	Alexander the Great uses stone-throwing torsion catapults at the Siege of Halicarnassus.

333 B.C.E.	Alexander uses combined infantry and cavalry forces to rout the Persian cavalry under Darius III at the Battle of Issus.
332 B.C.E.	Alexander begins the Siege of Tyre.
331 B.C.E.	Alexander defeats main army of Darius III at Gaugamela, which sees Alexander charge the center of a much larger army, forcing Darius to flee prematurely.
326 B.C.E.	The Indian king Porus employs war elephants against Alexander's forces at the Battle of the Hydaspes, seriously disrupting the Macedonian phalanx.
323 B.C.E.	The death (or murder) of Alexander the Great leads to the start of the Diadochi Wars, which will see fighting throughout the Near East and Middle East over much of the next century.
c. 321 B.C.E.	Chandragupta Maurya expels Alexander's forces from India and establishes the Mauryan Dynasty.
307 B.C.E.	King Wu Ling of Zhao (Chao), inspired by steppe nomad tribes to the north, introduces the use of cavalry in China.
305-304 B.C.E.	Macedonians employ a huge siege tower known as a *helepolis* during the Siege of Rhodes.
c. 3d cent. B.C.E.	The Parthians, a steppe nomad people, perfect the Parthian shot, fired backward from the saddle while in retreat.
c. 3d cent. B.C.E.	Romans utilize the corvus, a nautical grappling hook that allows sailors to board and capture opposing vessels.
280 B.C.E.	Pyrrhus from Macedonia defeats the Romans at the Battle of Heraclea, but his losses are so great that similar battles become known as a Pyrrhic victories.
275 B.C.E.	The guards in Rome associated with the Scipio family become known as the Praetorian Guards, later the guards for the Roman emperors.
c. 274 B.C.E.	Aśoka the Great, grandson of Chandragupta Maurya and a military genius in his own right, solidifies the strength of the Mauryan Empire.
264 B.C.E.	Outbreak of the First Punic War, the first major war in the central Mediterranean.
247 B.C.E.	Hamilcar Barca is appointed Carthaginian military commander, marking the emergence of Carthage as a major military threat.
241 B.C.E.	In the final naval victory of the First Punic War, Rome expels the Carthaginians from Sicily.
237 B.C.E.	Hamilcar begins a Spanish military campaign in preparation for ultimate war with Rome.
221 B.C.E.	Hamilcar's son Hannibal takes command of the Carthaginian military.
221-206 B.C.E.	The Qin (Ch'in) Dynasty rules in China, vastly expanding the area under imperial control.

218 B.C.E.	Hannibal leads a force of war elephants, cavalry, and foot soldiers across the Alps to trap and defeat the Romans at Trebia. The Second Punic War begins.
216 B.C.E.	Hannibal issues Rome its greatest defeat in battle at Cannae.
214 B.C.E.	Chinese emperor Qin Shihuangdi (Ch'in Shih huang-ti) orders that the many portions of the Great Wall be joined to form a unified boundary.
c. 206 B.C.E.-220 C.E.	Crossbows come into regular usage in China.
206 B.C.E.-220 C.E.	The Han Dynasty rules in China.
202 B.C.E.	The Romans succeed in driving back Carthaginian war elephants, gaining a surprise victory and leading to the end of the Second Punic War.
197 B.C.E.	The Romans defeat the main army of Macedonian king Philip V at Cynoscephalae.
168 B.C.E.	The Romans defeat Philip V's son, Perseus, at Pydna, eventually organizing Macedonia as a Roman province.
167-161 B.C.E.	Judas Maccabeus leads campaigns against Greek rule in Judea.
146 B.C.E.	Rome defeats Carthage in the Third Punic War, destroying its greatest enemy and assuring its long-term dominion.
c. 1st cent. C.E.	Aksumite Ethiopians emerge as dominant players in the control of Red Sea trade.
87 B.C.E.	The rise of Sulla as dictator of Rome leads to a power struggle that lasts for the next sixty years.
73 B.C.E.	Hsiung-nu (Huns) invade and attack Turkestan, heading westward from China.
73-71 B.C.E.	The Third Servile War sees slaves revolt and fight under the command of Spartacus. Crassus, a wealthy Roman politician, pays for the furnishing of soldiers.
62 B.C.E.	Defeat of Roman populist leader Catiline, who stages a revolt to bring down the Roman Republic. His supporters essentially form the basis for those who will support Julius Caesar in the Roman Civil War.
58-45 B.C.E.	Julius Caesar employs independently operating cohorts in the Gallic Wars and the Roman Civil Wars against Pompey.
55 B.C.E.	Caesar's soldiers build a bridge over the River Rhine to help with the invasion of Germany.
53 B.C.E.	Parthian mounted archers defeat heavily armed Roman infantry at the Battle of Carrhae, destroying the army of Marcus Licinus Crassus.
c. 50 B.C.E.-50 C.E.	The earliest horseshoes are made in Gaul.
39-37 B.C.E.	Herod is named king of Judea by the Roman senate and leads campaigns to establish his kingdom.
c. 31 B.C.E.	Specialist corps of slingers largely disappear from ancient armies.

20 B.C.E.	Augustus manages to reach a treaty with Parthians.
66-70 C.E.	The Jews wage war against the Romans.
70 C.E.	The Romans besiege Jerusalem, taking the city's population captive and leveling its buildings.
70-73 C.E.	The Romans employ ramps and siege towers in their successful three-year Siege of Masada.
c. 2d cent. C.E.	The use of armor spreads from the Ukraine to Manchuria.
c. 100	With the increasing use of cavalry in Roman warfare, the spatha, a long slashing sword, becomes popular.
c. 122-136	Hadrian's Wall is constructed in northern England, marking the northernmost border of the Roman Empire.
c. 3d-4th cent.	Despite the increasing role of cavalry due to barbarian influence, infantry remains the dominant component of the Roman legions.
220-280	The Wei (220-265), Shu-Han (221-263), and Wu (222-280) Dynasties rule in China during Three Kingdoms period.
226	Establishment of the Sāsānian Empire in Persia.
c. 250	The decline of the Kushān Empire leads to instability in Central Asia.
265-316	The Western Jin (Chin) Dynasty rules in China.
267	Zenobia, the female ruler of Palmyra, defeats the Romans.
270	The Romans start fighting the Goths again.
284	Roman emperor Diocletian reduces the power of the Praetorian Guard.
c. 4th cent.	The use of stirrups is introduced in China, allowing cavalry armor to become heavier and more formidable.
300-1763	During the miasma-contagion phase of biological warfare, environments are deliberately polluted with diseased carcasses and corpses.
312	At the Battle of the Milvian Bridge, the Roman commander Constantine sees a cross in the sky and promises to become a Christian if he wins the battle. The cross inspires his soldiers, who defeat Maxentius, leader of the Gauls. After the battle Constantine disbands the Praetorian Guard.
317-420	The Eastern Jin (Chin) Dynasty rules in China.
320	Chandragupta II establishes the Gupta Dynasty, recalling the glory days of the Mauryan Empire and employing a feudal system of decentralized authority.
324	Roman emperor Constantine builds a new eastern capital at Constantinople, which will become the capital of the Eastern Roman Empire.
370	Rome rebuilds its walls as protection against barbarian invasions.

378	The Second Battle of Adrianople sees Goths advancing into Thrace and threatening Constantinople.
386-588	The Southern and Northern Dynasties rule concurrently in China.
c. 400	The bow and arrow is introduced in eastern North America.
c. 400	Cavalry replaces infantry as the most important element in Roman armies.
c. 400	Horseshoes come into general use throughout Europe.
c. 400	The Chinese first make steel by forging cast and wrought iron together.
c. 400	Japanese clans start fighting for control of Kyushu.
410	Romans withdraw their soldiers from Britain.
451	Attila the Hun invades Roman Gaul.
476	The Sack of Rome by barbarians brings about an "age of cavalry," during which foot soldiers play a diminished role in warfare.
500	Central Asian invaders appear in India, bringing superior fighting techniques and concentrated use of cavalry.
507	Clovis defeats the Visigoths at Vouille and unifies Gaul.
527-565	Roman emperor Justinian reigns, definitively codifying Roman law, waging war against the Germans and Persians, and changing the empire from a constitutional to an absolute monarchy.
536	Goths capture and sack Rome.
553	The T'u-chüeh Empire is founded in Mongolia.
568	Lombards start invading Italy.
c. 580	Maurice from Byzantium (Flavius Tiberius Mauricius) writes *Strategikon*, outlining military tactics.
581	The rise of the Sui Dynasty reestablishes a central government in China.
c. 7th cent.	The Aksumite kingdom in eastern Africa is weakened by the spread of Islam throughout Arabia and North Africa.
610-641	Heraclius reigns over the Byzantine Empire, Hellenizing the culture and introducing the theme system of Byzantine provinces ruled by military governors.
622	In a journey known as the Hegira, the Islamic prophet Muḥammad (c. 570-632) flees from Mecca to Medina to avoid persecution.
632-661	Muḥammad is succeeded after his death in 632 by the four legitimate successors of the rashidun (from Arabic *rāshidūn*, "rightly guided") caliphate.
674-678	Greek fire, an inflammable liquid, is used by the Byzantines against Arab ships during the Siege of Constantinople.
680	Arabs invade Anatolia.

680	The forces of Muḥammad's grandson Ḥusayn are ambushed and massacred at the Battle of Karbalā, marking the beginning of Shia as a branch of Islam.
687	Pépin of Herstal wins the Battle of Tertry, solidifying rule over all Franks, and unifies the office of Mayor of the Palace.
c. mid-8th cent.	Islam becomes the dominant religio-political power structure of the Middle East, from the Atlantic to the Indian frontier, including the Mediterranean coast and Spain.
c. 700-1000	Ghana emerges as the dominant kingdom and military power of the western Sudan in Africa.
714	Pépin's illegitimate son, Charles Martel, seizes control over Frankish kingdom in a palace coup.
732	Rise of the Carolingians in France.
740	The Berber Revolt in northern Africa expands into Spain.
740-840	Uighurs destroy the T'u-chüeh Empire and dominate Mongolia.
c. 750	Carbon-steel swords first appear in Japan.
c. 757-796	Offa's Dyke is built in the kingdom of Mercia to protect the kingdom's Welsh border.
793	Vikings sack Lindisfarne Abbey in northern England.
800	Charlemagne is crowned Holy Roman Emperor by Pope Leo III, establishing a new military system that is compared to that of the Romans but that lacks the coherence of the Roman or Byzantine system.
839	Byzantine emperor Theophilus starts hiring foreign mercenaries, who later become the Varangian Guard.
840-920	The Kirghiz invade Mongolia and drive out the Uighurs, thereafter dominating the region.
843	Vikings sack Dorestadt and Utrecht.
845	Charles the Bald, king of the Franks, pays Vikings money to retreat.
880's	King Alfred the Great begins constructing a series of *burhs*, or garrisons, to defend Wessex from Vikings. He later founds the (British) Royal Navy to prevent raids on England.
886	The Vikings mount their last siege of Paris.
891	Vikings suffer a rare defeat at Louvain.
900	Leo IV the Wise writes *Tactica*, outlining Byzantine military strategy.
980	The Byzantine warrior emperor Nicephorus Phocas inspires a third Byzantine military manual.

c. 10th cent.	Ghaznavid Turks invade India from Afghanistan, introducing an Islamic influence that will continue almost uninterrupted until the early sixteenth century.
911	The Viking Rollo receives the county of Normandy from the French king.
920	The Khitans drive out the Kirghiz and establish an empire in Mongolia and China.
c. 930	Vikings settle in Iceland.
954	The English expel the last Viking king from York.
990's	The first stone keeps appear in northwestern Europe.
c. 10th-11th cent.	The crossbow makes its first European appearance, in Italy.
1013	Danish king Sweyn I Forkbeard defeats English king Æthelred I and forces him into exile.
1017-1035	Sweyn's son Canute I (the Great) rules both England and Denmark.
1044	The first precise recipe for gunpowder is given, in a Chinese work.
Aug. 15, 1057	The death of Macbeth, usurper of the Scottish throne.
1066	The defeat and death of Harold Hardrada at the Battle of Stamford Bridge ends Viking invasions of Britain. William of Normandy defeats the English at the Battle of Hastings, using cavalry armed with lances against a shield wall, and a rapid proliferation of motte-and-bailey castles follows.
1082	At the battle of Durazzo (or Dyrrachium), Norman cavalry tactics from the Battle of Hastings are used against Byzantines to great effect.
1089-1094	El Cid (Rodrigo Díaz de Vivar) captures Valencia, leading a mixed Christian-Moorish army.
1095-1099	During the First Crusade, initiated by Pope Urban II, European Crusaders, fighting to protect the Holy Land for Christianity, capture Jerusalem.
1100	European knights adopt the use of the couched lance, which provides more force than previous hand-thrust weapons.
1125	Jürcheds conquer northern China, driving out Khitans, and Mongolia descends into tribal warfare.
1139	The use of the crossbow in Christian Europe is prohibited by Pope Innocent II at the Lateran Council.
1145-1149	The Second Crusade, unsuccessfully led by the kings of France and Germany, is prompted by Muslim conquest of the principality of Edessa in 1144.
1187-1192	The Third Crusade succeeds, especially through the efforts of English king Richard I, in restoring some Christian possessions.
1192	The samurai Minamoto Yoritomo establishes the first shogunate at Kamakura, bringing order to Japan after four centuries of feudal chaos and political vacuum.

1196-1198	King Richard I of England builds Château Gaillard with three baileys, which had to be captured before the castle could be taken and hence served as multiple lines of defense.
1198-1204	The Fourth Crusade, initiated by Pope Innocent III, captures Constantinople and seriously damages the Byzantine Empire.
c. 1200	In North America, the southwestern Anasazi culture is destroyed, possibly by raiding Ute, Apache, Navajo, and Comanche tribes.
c. 1200	As forged steel processes are refined, several European cities, including Sheffield, Brussels, and Toledo, emerge as sword-making centers.
1206	Genghis Khan is named ruler of the Mongols.
1213	The Mongols invade China.
1215	The Magna Carta is signed by King John of England, granting rights to the people of England, especially the barons; King John outlaws the use of the crossbow and the deployment of mercenaries in England.
1217-1221	The Fifth Crusade, organized to attack the Islamic power base in Egypt, succeeds in capturing the Egyptian port city of Damietta but ends in defeat when the crusading army attempts to capture Cairo.
1228-1229	In what is sometimes referred to as the Sixth Crusade, the excommunicated Holy Roman Emperor Frederick II sails to the Holy Land and negotiates a reoccupation of Jerusalem.
c. mid-13th cent.	The cog, with high sides that offer protection against other vessels, is developed in northern Europe.
1230	The kingdom of Mali is founded by a Mandinka prince after the defeat of the Susu kingdom.
1236-1242	The Mongols achieve conquests in Russia, Eastern Europe, Iran, and Transcaucasia.
1248-1254	The Seventh (or Sixth) Crusade is led by Louis IX of France and follows a course similar to that of the Fifth Crusade.
1258	Mongols capture Baghdad and end the ʿAbbāsid Caliphate.
1260	Mongols invade Syria and capture Damascus but are defeated at the Battle of Ain Jalut by Mamlūk slave cavalry, trained by the Egyptians to steppe nomad levels.
1261	A war between the Il-Khanate of Persia and the Golden Horde of Russia begins.
1269-1270	The Eighth (or Seventh) Crusade is organized by the now elderly Louis IX, whose death upon landing in Tunisia leads to the breakup of his army.
1270-1272	Edward I, the son of Henry III of England, decides to press on alone to Palestine after the French abandon the Eighth Crusade and achieves some modest success with a truce before the ultimate fall of Acre, the last bastion of the Crusader states, in 1291.

1274, 1281	The Mongol fleet is destroyed in an attempt to invade Japan.
1277-1297	King Edward I of England builds a series of ten Welsh castles, with an implicitly offensive function as continuances of the king's campaigns.
1279	Kublai Khan establishes the Yuan Dynasty.
1298	The English army, employing large numbers of Welsh archers, uses the longbow to great effect against the Scots at Falkirk.
c. 14th cent.	An "infantry revolution," spurred by the greater use of the pike and bow, takes place in Europe.
c. 1300	An increase in separate tribal identities among North American indigenous peoples develops in response to the increasing importance of agriculture and a clearer definition of gender roles.
c. 1300	The Chinese first use black powder to propel projectiles through bamboo tubes, revolutionizing warfare.
1300	Japanese craftsmen perfect the art of sword making, creating the katana, a curved sword used by samurai warriors.
1302	Flemish pikemen defeat French knights with an advantageous choice of terrain at Courtrai.
1314	Emperor Amda Tseyon comes to power in Ethiopia, expanding and solidifying the Solomonid Dynasty.
1315	Swiss pikemen begin a string of victories against mounted knights by defeating the Austrians at Morgarten, leading to their dominance of infantry warfare in the fourteenth and fifteenth centuries.
1331	The first recorded European use of gunpowder weaponry occurs at the Siege of Friuli in Italy.
1335	The Il-Khanate of Persia ends.
1340	Definitive use of gunpowder weapons is made at the Siege of Tournai.
1346	English longbowmen defeat French knights at the Battle of Crécy, which also marks the first definitive use of gunpowder artillery on a battlefield.
1346-1347	Cannons are deployed by the English at the Siege of Calais.
c. mid-14th cent.	The carrack, an efficient sailing ship with multiple masts, becomes popular in Atlantic and Mediterranean waters.
1360	Sir John Hawkwood forms his White Company, English mercenaries operating in Italy.
1368	The Chinese Yuan Dynasty ends, and the Mongols are driven back to Mongolia, where a period of civil war ensues.
1369	Tamerlane (Timur) becomes ruler of Central Asia.

1377	Cannons are first used successfully to breach a wall at the Siege of Odruik in the Netherlands.
1398	Mongol invasions by Tamerlane devastate North India.
1415	English archers and infantry inflict a major defeat upon mounted French knights at the Battle of Agincourt, initiating the decline of the heavily armored cavalry knight.
1420	Hussite leader Jan Žiţka stymies German knights during the Hussite Wars with his Wagenburg, a defensive line of wagons and cannons.
c. 1425	The corning, or granulating, process is developed to grind gunpowder into smaller grains, leading to corned powder and matches.
June 18, 1429	French cavalry succeed in defeating English longbowmen for the first time in the Hundred Years' War.
1432	The sacking of Angkor ends the domination by the Khmer kingdom of mainland Southeast Asia.
1450	In West Africa, Songhai incorporates the former kingdom of Mali and comes to control one of the largest empires of the time.
c. 14th-15th cent.	The increasing predominance of firearms in Europe results in the diminishing use of archers in warfare.
1450-1700	Sword blades become lighter, narrower, and longer, gradually evolving into the familiar rapier design.
1453	With use of large cannons, the Muslim Turks besiege and capture Constantinople from the Byzantines and establish the Ottoman Empire, a watershed event often used to mark the transition from the medieval to the early modern world.
1468	Songhai armies invade Timbuktu, execute Arab merchants and traitors, and sack and burn the city, thereby heralding a period of anti-Islamic sentiment in West Africa.
1471	The Battle of Barnet, north of the English capital, London, involves cannons for the first time on an English battlefield, but bad weather prevents their use.
1477-1601	Perpetual civil war is waged throughout the Sengoku (Warring States) period.
c. 1480	Fortifications begin to undergo design changes, such as lower, wider walls to accommodate the use of cannons.
Aug. 22, 1485	The Battle of Bosworth Field, which results in the death of King Richard III and victory for King Henry VII, effectively ends the Wars of the Roses in England.
1492	Spanish troops capture Granada, ending the Reconquista; later the same year, Christopher Columbus sails to the New World.
1494	Charles VIII introduces the modern siege train in his invasion of Italy, confirming the obsolescence of high medieval defenses.

1494	The Treaty of Tordesillas leads to a "division" of the world by Pope Alexander VI between the Spanish and the Portuguese.
c. 1500	The Iroquois Confederacy, an alliance of separate tribes formed to fight hostile western and southern neighbors, is established in the American Northeast.
c. 1500	The development of gunpowder muskets, pistols, and cannons forces tactical and strategic changes in the use of spears, bows and arrows, swords, cavalry, and armor.
c. 1500	As European plate armor becomes more prevalent, the sharper, narrower rapier is developed to combat it.
c. 1500	Leonardo da Vinci draws what could arguably be the first design for a helicopter.
c. 1500	A Chinese scientist is killed by the explosion of gunpowder rockets he had tied to a chair in an effort to develop a flying machine.
1501	The development of gunports allows a ship's heaviest guns to be mounted on its lowest decks, stabilizing its center of gravity.
1503	The first effective use of the combination of firearms and pikes, a formation called the Spanish Square, is made at the Battle of Cerignola.
Jan. 21, 1506	The Swiss Guards are formed to protect the pope.
1520-1521	Hernán Cortés and a small force of Spanish conquistadors destroy the Aztec Empire.
1522	Spanish harquebusiers slaughter Swiss pikemen in the service of the French at the Battle of Bicocca.
1525	The Spanish Square formation of pikemen and harquebusiers is used to defeat French cavalry at the Battle of Pavia.
Apr. 20, 1526	Bābur makes effective use of artillery to defeat Sultan Ibrāhīm Lodī at the famous Battle of Pānīpat, establishing the Mughal Empire.
1527	The Mughals defeat the Rajputs at the Battle of Kanwa.
1529	Muslim leader Aḥmad Grāñ defeats forces of Lebna Dengel at the Battle of Shimbra-Kure, opening southern Ethiopia to Islamic rule.
1529	The Mughals defeat the Afghans at the Battle of Ghāghara.
c. 1530	King Henry VIII of England builds a series of forts on England's southern coastline to guard against European invasion.
1531-1532	The Spanish under Francisco Pizarro start the sacking of the Inca Empire.
c. mid-1500's	European cavalries begin to appear armed with short muskets that can be fired from both mounted and dismounted positions.
1541	Portuguese musketeers arrive to help defend Ethiopia, ending the Islamic threat two years later, under the emperor Galawdewos.

1541	The English start making iron cannons in Ashdown Forest.
1543	Firearms are first used in Japan.
1544	At Cerisolles, French knights fighting in the traditional style play a major role in gaining victory over the Swiss, the last battle in which they are to do so.
1545-1550	Formation of the Streltsy in Moscow by Ivan the Terrible, as guards of the Russian czars.
1556	Bābur's grandson Akbar is victorious at the second Battle of Pānīpat, against the Sur descendants of Shīr Shāh, and eventually conquers most of northern and eastern India, Afghanistan, and Baluchistan.
1562	The caracole maneuver is first executed by Huguenot pistolers against Catholic forces at the Battle of Dreux.
1565	The Siege of Malta ends the Turkish advance across the Mediterranean.
1571	The Battle of Lepanto II, fought between the Ottoman Turks and the Christian forces of Don Juan de Austria, is the last major naval battle to be waged with galleys.
1575	Three thousand musketeers help General Oda Nobunaga win control of central Japan.
Aug. 4, 1578	In the Battle of the Three Kings in Morocco, a Portuguese army is destroyed by Moroccans, precipitating a crisis in the Portuguese royal family leading to King Philip II of Spain becoming king of Portugal.
1588	The English employ galleons to attack the larger ships of the formidable Spanish Armada individually, thereby defeating the Spanish and revolutionizing naval tactics.
1591	Songhai is conquered by a Moroccan army consisting primarily of European mercenaries armed with muskets, the first to be used in West African warfare.
c. late 16th cent.	Japanese sword-making techniques reach a peak of sophistication, with a variation of the hammer-welding process.
c. 17th cent.	The howitzer is developed by the English and Dutch for use against distant targets.
c. 1600	The military reforms of Maurice of Nassau reduce the size and depth of pike formations to facilitate maneuverability and increase the number of muskets in units.
1600	The Battle of Nieuwpoort in the Netherlands is the first battlefield test of Maurice of Nassau's linear infantry tactics.
1603	Tokugawa Ieyasu establishes the Tokugawa shogunate, with its capital at Edo, marking the beginning of early modern Japanese history.
1605	Miguel de Cervantes writes *El ingenioso hidalgo don Quixote de la Mancha* (*Don Quixote de La Mancha*), ridiculing the role of the armored knight in Spain.

1609	The Netherlands forces Spain to grant a truce tacitly recognizing Dutch independence after more than thirty years of revolution of Dutch Protestant provinces against Spanish occupation.
1609	The Kalmyk people on the Caspian Sea become a part of the Russian Empire, and their horsemen start serving in the Russian cavalry.
1618-1648	The Thirty Years' War leads to mass destruction of Central Europe, with major atrocities and killing of civilians. It is estimated that some eight million people in Germany alone die in the war.
1631	Gustavus II Adolphus's military reforms prove their value at the Battle of Breitenfeld, as Gustavus's disciplined cavalrymen combine firepower and shock tactics.
1632-1653	The fifth Mughal emperor, Shāh Jahān, builds the Taj Mahal as a monument to his love for his wife.
1642-1651	During the English Civil Wars, the Royalist Army is the first to use horse artillery in the form of a small brass cannon mounted onto a horse-drawn cart.
1645	Oliver Cromwell establishes the New Model Army.
1653	The line of battle is developed as a naval tactic, allowing for more effective use of broadside firepower.
1657	ʿĀlamgīr becomes the sixth Mughal emperor and ultimately expands the Mughal Empire to its greatest extent.
c. 1660	Sébastien Le Prestre de Vauban emerges as a genius of military engineering, designing bastioned fortifications.
Jan. 1, 1660	The Coldstream Guards (from a unit raised by Colonel George Monck from 1650) become the first part of a standing army in Britain.
1673	The first transportable mortar, invented by Baron Menno van Coehoorn, is used at the Siege of Grave.
1673	The use of saps and parallels is introduced by Sébastien Le Prestre de Vauban at the Siege of Maastricht.
1673	Dutch scientist Christiaan Huygens develops a motor driven by the explosion of gunpowder.
Sept. 11-12, 1683	Polish King John III Sobieski leads 3,000 Polish landers and hussars and 17,000 other cavalry against the Ottoman army, in the largest cavalry charge in history at the Battle of Vienna.
1688	Sébastien Le Prestre de Vauban introduces the socket bayonet, which fits over a musket's muzzle and allows the musket to be loaded and fired with the bayonet attached. As the socket bayonet replaces the pike, specialized pike troops disappear from use. At the Siege of Philippsburg that year, he introduces ricochet fire.

1689	Russian czar Peter II "the Great" disbands the Streltsy Corps, which has protected the czars since the 1550's (but became involved in many court intrigues).
1690	The Brown Bess flintlock musket is developed, and its variations remain in use by all European nations until the mid-nineteenth century.
c. 1700	The introduction of rifling and patched-ball loading increases the accuracy of firearms.
c. mid-1700's	Advances in cannon technology allow smaller guns to shoot farther with less powder.
1712-1786	King Frederick the Great of Prussia is the first to use Jaegers, or "huntsmen," expert mounted marksmen.
1754-1763	Large muskets are first used successfully by Americans in the French and Indian War.
1757	Frederick the Great wins renown and respect with his masterful use of the oblique attack at Leuthen.
1759	Frederick the Great introduces the first true horse artillery units, which, because of their unprecedented mobility and firepower, are quickly adopted by other European nations to become a staple of most eighteenth and nineteenth century armies.
Sept. 13, 1759	British troops under General James Wolfe land secretly and attack Montreal, suprising the French commander, Louis-Joseph de Montcalm. Both Wolfe and Montcalm are killed in the battle.
1763-1925	During the fomites phase of biological warfare, specific disease agents and contaminated utensils are introduced as weapons, with smallpox, cholera, and the bubonic plague as popular agents.
1769	French military engineer Joseph Cugnot develops a steam-driven carriage, arguably the first true automobile. It is essentially designed for the transportation of field artillery for sieges.
1775	David Bushnell invents a one-man submarine, the *Turtle*, which is used in the American Revolutionary War.
Dec. 19, 1777	George Washington starts training his soldiers at Valley Forge, continuing until June 19, 1778.
1778-1779	Frederick the Great begins deploying semi-independent detachments during the War of Bavarian Succession, foreshadowing use of independent army divisions.
1781	The Siege of Yorktown effectively ends the American War of Independence.
1790's	British artillerist Henry Shrapnel invents the "shrapnel shell," packed with gunpowder and several musket balls and designed to explode in flight.
1792	Modern French military techniques and arms are introduced into Turkey.
1792	War rockets are used by the sultan of Mysore to terrorize British soldiers.

1795	The Springfield Armory is founded in Massachusetts.
1798	British admiral Horatio Nelson abandons traditional line tactics, achieving victory over the French at Abū Qīr Bay.
1799	The Royal Military College is established at Woolwich to train British army officers.
1802	The Royal Military College at Sandhurst is founded to train British army officers.
1802	The Tay Son Rebellion ends, leading to the emergence of the Nguyen Dynasty in Vietnam.
Mar. 16, 1802	The United States Military Academy at West Point is founded.
1803	The École Speciale Militaire de Saint-Cyr, the French military academy, is established.
1804-1815	French emperor Napoleon I (Bonaparte) develops his cavalry to the height of its quantity and quality, making it as significant as infantry in the outcomes of battles and campaigns.
1805	British artillerist William Congreve develops the first warfare rockets and launching tubes.
1807	American inventor Robert Fulton invents the first steamship, which by the time of the Crimean War (1853-1856) has largely replaced the sail-powered ships in British, French, and American navies.
Feb. 8, 1807	Joachim Murat leads 11,000 French cavalry in an attack on the Russians at the Battle of Eylau, allowing Napoleon Bonaparte to win the battle.
July-Dec., 1809	The Walcheren Expedition sees British forces in the Netherlands destroyed by disease, probably malaria caused when Napoleon opened the dikes and much low-lying land was flooded.
1812	In the opening part of the War of 1812, the British capture Washington, D.C.
Dec. 12, 1812	Napoleon's Grande Armée, consisting of French and allied soldiers, retreats from Moscow and is destroyed by Cossacks and by disease, especially typhus, in their retreat.
1814	The Russian cavalry enter Paris as Napoleon flees and later abdicates. He is sent into exile on the island of Elba.
1814-1815	The Conference of Vienna is followed by the inauguration of the Congress System to help promote collective security in Europe.
June 18, 1815	The defeat of Napoleon at Waterloo signals the end of the Napoleonic Wars and the end of French military dominance in Europe. Napoleon is sent into exile at St. Helena.
1816-1819	The rise of Shaka and the establishment of the Zulu Kingdom in southern Africa.
1817	Gurkhas start serving in the Pindaree War, alongside the British, under a contract between them and the East India Company.

July 26, 1822	José de San Martín and Simón Bolívar meet at Guayaquil, Ecuador, drawing up plans for an independent South America.
1826	The janissary corps are destroyed and the Turkish army is modernized.
1831	The duke of Wellington establishes the Royal United Services Institute in London.
Mar. 9, 1831	The French Foreign Legion is founded.
1832	The last of the classical sieges occurs at Antwerp.
1834	Turkey creates its first military academy.
1836	The Colt revolver is first manufactured in the United States by Colt's Patent Firearms Manufacturing Company, later renamed Colt's Manufacturing Company. It was patented by its inventor, Samuel Colt, and quickly emerged as a popular handgun in the United States.
Feb., 1836	Mexicans capture the Alamo but are defeated soon afterward at the Battle of San Jacinto.
Dec. 16, 1838	Voortrekkers in South Africa win the Battle of Blood River against the Zulus by forming a laager with their wagons.
1838-1842	The First Anglo-Afghan War leads to defeat for the British.
1840's	The telegraph becomes widely used and links governments with field commanders.
1840's-1850's	The Paraguayan government embarks on modernization, including the establishment of its own arms industry.
1845-1920	Asphyxiating gas weapons are developed for chemical warfare, using chlorine and phosgene.
Oct. 10, 1845	The United States Naval Academy at Annapolis is established.
1846-1848	Although military swords have entered a period of decline, cavalry sabers prove decisive during the Mexican War.
1847	Anesthesia is first used during a battlefield operation.
1848	The Sharps carbine, a single-shot, dropping-block breechloader firing paper and metallic cartridges, is developed.
1848	Revolutions throughout much of the Habsburg Empire lead to a political restructuring of Europe.
Aug. 22, 1849	The Austrian army uses balloons loaded with explosives to attack the Italian city of Venice.
1853-1856	The Crimean War sees major improvements in military medical hygiene, spearheaded by Florence Nightingale, as well as the "first" full-time war correspondent, William Howard Russell of the London newspaper *The Times*.
Oct. 25, 1854	The Charge of the Light Brigade, during the Crimean War.

1856	The Bessemer process of economical steel production is invented.
1856	The Victoria Cross, the highest British medal for bravery in battle, is awarded for the first time.
1857	A mutiny of Indian soldiers serving in British India leads to a widespread revolt against the British and the massacre of many Britons at Cawnpore (Kanpur).
1860	England launches HMS *Warrior*, its first ironclad warship.
1861	The first machine gun, the Gatling gun, is designed by Richard Gatling.
Apr. 12, 1861	Confederate forces attack Fort Sumter, South Carolina, starting the American Civil War.
Mar. 9, 1862	The Battle of Hampton Roads, between the ironclads USS *Monitor* and CSS *Virginia*, revolutionizes naval warfare.
May 5, 1862	Confederate General Gabriel J. Rains uses the first land mines to cover his retreat from Williamsburg, Virginia.
May 31-June 1, 1862	At the Battle of Seven Pines (Fair Oaks), Virginia, a machine gun is used for the first time in war.
Sept. 17, 1862	At the Battle of Antietam, Union General Ambrose Burnside blunders his way into a defeat, becoming one of the least successful commanders in the war.
1863	Establishment of the Red Cross by Henri Dunant, inspired by the treatment of casualties at the Battle of Solferino in the previous year.
July 1-3, 1863	The Confederate general Robert E. Lee is defeated at the Battle of Gettysburg, during a Confederate attempt to “take” the war into the North.
1864	Paraguayan president Francisco Solano López intervenes in the Uruguayan Civil War and soon ends up at war with Argentina, Brazil, and Uruguay.
Feb. 17, 1864	The Confederate submarine CSS *H. L. Hunley* becomes the first underwater vessel to sink an enemy ship, the USS *Housatonic*, near Charleston, South Carolina.
May, 1864	General William T. Sherman starts his Atlanta Campaign, which will see the destruction of a large part of Georgia.
1866	British engineer Robert Whitehead develops the first practical torpedo.
1867	The last Tokugawa shogun surrenders power to imperial forces, paving the way for the Meiji Restoration and Japan’s reentry into world politics and culture.
June 19, 1867	The execution of Emperor Maximilian I of Mexico ends the establishment of a pro-French Mexican Empire.
Feb., 1868	The Brazilian navy destroys Paraguayan fortifications at Humaita, allowing Brazil to attack the Paraguayan capital, Asunción.
1870	The Russians order Smith and Wesson pistols, the first military order for these.

1870-1871	The Franco-Prussian War sees the French quickly defeated and the Prussians take Paris.
1873	German arms manufacturer Alfred Krupp invents one of the first practical recoil systems for field artillery pieces.
1873	The Bofors iron and arms company is established in Sweden; it is later owned by Alfred Nobel.
1873	The Nordenfelt gun, designed by Swedish engineer Helge Palmcrantz, is patented and named after the steel producer Thorsten Nordenfelt.
Sept., 1878-Nov., 1880	The Second Anglo-Afghan War.
Jan. 22, 1879	The Battle of Isandhlwana sees the defeat of a British expeditionary force by the Zulus at the start of the Anglo-Zulu War; on the following day, at Rorke's Drift, the British are victorious.
1880's	The French develop high-explosive artillery, rendering all existing forts obsolete.
Aug., 1880	The Enfield rifle is tested and approved for use by the British Army.
1884	Hiram Stevens Maxim invents the first practical machine gun.
Jan. 26, 1885	The Siege of Khartoum, Sudan, ends in the capture of Khartoum and the death of Charles Gordon.
1889	John M. Browning begins developing his guns in the United States.
1892	The Model 1892 "Lebel" revolver is developed by the French.
Mar. 1, 1896	The Italian army is defeated at the Battle of Adowa, the first major defeat of a European army in Africa.
1897	The French develop the first antiaircraft gun for use against balloons.
1898	The Mauser Model 1898 is produced; it is the culmination of military bolt action design.
1898	The Germans invent the Luger revolver.
Sept. 2, 1898	Some 400 British lancers charge and rout 2,500 Sudanese at the Battle of Omdurman.
1900	The Siege of the Foreign Legations in Beijing, China, results in the dispatch of a large, multinational European force to China to rescue diplomats and others in the Legations.
1900	The zeppelin, also known as a rigid airship or dirigible, a steerable lighter-than-air aircraft, is invented in 1900 by German count Ferdinand Graf von Zeppelin.
May 17, 1900	The Relief of Mafeking in South Africa (modern-day Botswana) follows a siege that captured the imagination of the press around the world.

1903	The Wright brothers, William and Orville, launch the first successful airplane at Kitty Hawk, North Carolina.
1904	Japan attacks the Russian-controlled port of Lüshun, traditionally known as Port Arthur, beginning the Russo-Japanese War, a conflict between Russia and Japan for control over Korea and Manchuria.
1904-1905	Trinitrotoluene (TNT) is first used as a military explosive during the Russo-Japanese War.
1904-1905	The effective use of indirect fire during the Russo-Japanese War spurs American and European leaders to adopt it for their own armies in order to defend their guns against counterbattery and infantry weapon fire.
1905	The Japanese navy wins a stunning victory at Battle of Tsushima, devastating the Russian fleets and forcing Russia to surrender Korea and other territory to Japan.
1905	The paramilitary Legion of Frontiersmen is formed.
1905	The French build the first airplane factory, near Paris.
1906	HMS *Dreadnought*, the first all-big-gun battleship, is launched at Portsmouth, England, transforming the nature of ship architecture.
1908	The Luger P.08 is adopted as the official German service pistol.
1910	A plane takes off for the first time from the deck of a ship, presaging the modern aircraft carrier.
Oct. 11, 1911	After an Italian pilot flies the first combat mission, using his plane for reconnaissance, during the Italo-Turkish War, Italy begins using airplanes and dirigibles for bombing attacks.
1912	“Bangalore torpedoes” are produced for the first time by Captain McClintock.
1912	Manufactured by Krupp for the Germans, Big Bertha was a howitzer capable of firing artillery long distances, used extensively in World War I.
1912	World War I armies form large cavalry components, which are converted into infantry as the war evolves into stagnant trench warfare, and high casualty rates occur.
1914	Rolls-Royce manufactures an armored car for the British Royal Naval Air Service, designed to protect the Belgian airfields from attack by the Germans. These were used in Palestine in 1917-1918.
Aug., 1914	German planes bomb Paris.
Aug. 28, 1914	The Battle of the Heligoland Bight is the first naval battle of World War I.
Sept., 1914	German U-9 submarines torpedo Allied ships.
Nov. 1, 1914	In the Battle of Coronel, the German East Asiatic Fleet destroys a smaller British force and then is itself destroyed at the Battle of the Falklands.
1915	The Beretta pistol is developed in Italy; the Beretta machine gun follows in 1918.

Jan. 24, 1915	During the Battle of the Dogger Bank, the British fleet is warned by radio intercepts.
Feb. 4, 1915	A major German submarine campaign against British shipping begins.
Apr., 1915	The first aerial "dogfight" takes place after German aircraft are fitted with machine guns that are coordinated to fire between the blades of a moving propeller.
Apr., 1915	The ultimately unsuccessful Allied attack on Turkey at Gallipoli begins.
Apr. 22, 1915	The Second Battle of Ypres sees the first use of poison gas in battle on the western front.
May, 1915	German zeppelins bomb London.
May 7, 1915	The sinking of the *Lusitania* leads to a major public outcry in the United States.
1915-1917	"Young Turk" Ottomans massacre between 1 and 1.5 million Armenians in Anatolia and historic western Armenia.
1916	Unmanned aerial vehicles (drone aircraft) are developed for attacking zeppelins; they are later used for reconnaissance and for bombing of enemy targets.
Apr. 20, 1916	Defeat of British forces after the Siege of Kut, which started on December 7, 1915.
Apr. 24-30, 1916	Easter Uprising in Ireland.
May 30-31, 1916	In the Battle of Jutland, the German fleet destroys the British fleet.
June 10, 1916	The Turks surrender their garrison in Mecca.
July 1, 1916	On the first day of the Battle of the Somme, 19,000 British soldiers are killed, the highest loss by the British army on any single day.
Feb., 1917	Czar Nicholas II abdicates during the First Russian Revolution.
May, 1917	The World War I Allies establish the Atlantic convoy system.
May 21, 1917	The Imperial War Graves Commission (later the Commonwealth War Graves Commission) is formed by Fabian Ware to look after the war dead from Britain and its empire.
July, 1917	T. E. Lawrence leads the Arabs in their capture of Aqaba from the Turks.
Oct. 31, 1917	In the Battle of Beersheba, the Australian Light Horse charge at Turkish positions in Beersheba, capturing the city.
Nov. 7, 1917	The second Russian Revolution sees communists seize power in Petrograd (St. Petersburg), leading to the start of the Russian Civil War. (The date was October 25 in Russia, then still using the Gregorian calendar.)
Nov. 20, 1917	The British make a successful tank attack at the Battle of Cambrai.
Apr. 21, 1918	The "Red Baron," Manfred Richthofen, the most famous air ace of World War I, is shot down.

Nov. 11, 1918	A cease-fire ends World War I.
1919	The restrictions imposed on the German military by the Treaty of Versailles at the end of World War I meet almost universal disapproval across the political spectrum in Germany.
1919	The Government Communications Headquarters (GCHQ) are established in Britain to listen in to radio transmissions in Europe, initially operating as a government code and cipher school.
1920	American John Taliaferro Thompson invents the most famous submachine gun, known as the "tommy gun," fully automatic and small and light enough to be fired by a single individual without support.
1920-1960	Nerve gases, such as tabun and sarin, are developed for chemical warfare to inhibit nerve function, leading to respiratory paralysis, or asphyxia.
Jan. 16, 1920	The League of Nations holds its first meeting to mediate in disputes between nations.
Aug. 31, 1920	At the Battle of Komarow, the Poles are involved in the last great cavalry charge in history.
Sept., 1920	Mohandas K. Gandhi, the "Mahatma," starts a campaign of nonviolent resistance against British rule in India.
Oct., 1920	The Spanish Foreign Legion is founded.
Oct., 1920	The Arab Legion is founded.
1921	British spy and later naval analyst Hector Bywater publishes *Sea-Power in the Pacific*, describing how the Japanese could win a Pacific war. The book prompts great interest in Japan.
1922	Turks capture Smyrna, signaling the defeat of the Greeks in the Greco-Turkish War.
1923	The Treaty of Lausanne creates the Republic of Turkey, bringing the Ottoman Empire to its official end.
1923	HMS *Hermes*, the first purpose-built aircraft carrier, is commissioned by the British government.
1923	The building of the Singapore Naval Base to protect British interests in East Asia and Southeast Asia is announced.
1925-1940	During the cell-culture phase of biological warfare, biological weapons are mass-produced and stockpiled; Japan's research program includes direct experimentation on humans.
1925	The Schutzstaffel (SS) is formed to protect members of the Nazi Party, later becoming a government "agency" in Germany. Its members perpetrate major crimes during World war II.
1926	Robert Goddard achieves the first free flight of a liquid-fueled rocket.

1928	Chiang Kai-shek captures Beijing and, as leader of the Nationalist Party, heads China's first modern government.
Nov., 1928	*Am westen nichts neues* (*All Quiet on the Western Front*), an antiwar novel by German World War I veteran and writer Erich Maria Remarque, is published in Germany.
Dec. 19-22, 1929	Britons and other Europeans are airlifted from Kabul, Afghanistan, in the first major airlift in war.
Sept. 18, 1929	German President Paul von Hindenburg repudiates German responsibility for World War I.
1930	As the building of extensive fortified lines begins, the French start work on the Maginot line along the eastern border of France, naming the fortifications for André Maginot, French minister of defense.
1930's	German scientist Wernher von Braun develops the first liquid-fueled rockets.
1931	The Japanese bomb Mukden in the first major aerial bombing of any city in history.
1932	The nationalist Chinese government of Chiang Kai-shek starts "extermination campaigns" against the Chinese communists.
1933	Adolf Hitler, leader of the National Socialist German Workers' (Nazi) Party, is appointed chancellor of Germany and calls for the abolition of the Treaty of Versailles and the rearmament of Germany.
1934-1935	Mao Zedong leads his Chinese communist forces on a 6,000-mile strategic retreat known as the Long March.
1935	The Italian invasion of Abyssinia leads to the collapse of collective security arrangements formulated by the League of Nations.
1935	British scientists develop the first radar.
1935	The Germans first develop the Stuka dive-bombers; the Stuka is used in combat for the first time in 1936 during the Spanish Civil War.
Mar. 28, 1935	The Catalina flying boat is first used for reconnaissance by the (British) Royal Navy.
Mar., 1936	The German government remilitarizes the Rhineland, leading to increased tensions in Europe.
July, 1936	The Spanish Civil War begins; during this conflict, much of Spain's infrastructure will be destroyed and new weapons will be tested.
July, 1936	German air force volunteers fighting on the Nationalist side in the Spanish Civil War form the Condor Legion.
1936	The M-1 Garand rifle is the first standard-issue semiautomatic military rifle.
1936	The first practical helicopter is developed by German engineer Heinrich Focke.

1936	The International Brigades are established in Spain.
Oct., 1936	The first tank-versus-cavalry and tank-versus-tank engagements of the Spanish Civil War take place near Esquivias, south of Madrid.
Apr., 1937	German air forces supporting the Nationalist cause in the Spanish Civil War bomb the Spanish town of Guernica, killing approximately 2,100 of the town's 8,000 inhabitants in arguably the first premeditated use of terror bombing.
May 6, 1937	The crashing of the *Hindenburg* airship results in the decline of interest in airships.
July, 1937	Japan invades China, initiating the Second Sino-Japanese War (1937-1945).
1938	The British use the Bren gun after its original design in Czechoslovakia.
Mar., 1938	In what has come to be known as the Anschluss, Germany annexes Austria, forming a country which dominates Central Europe.
Sept., 1938	With the agreement of other European powers, Germany annexes the Sudetenland from Czechoslovakia, and then the rest of Czechoslovakia in March, 1939.
Apr., 1939	Italy launches a joint naval and air attack on Albania, quickly capturing the country and annexing it.
Sept., 1939	German chancellor Adolf Hitler uses combined arms forces to invade Poland, which is then partitioned between Germany and the Soviet Union.
Sept. 1, 1939	Polish cavalry at Krojanty charge Germans, leading to the myth surrounding cavalry attacking tanks.
May 10, 1940	The German Luftwaffe conducts the first combat parachute and glider troop landings to open Germany's western-front attack on the Netherlands.
June, 1940	The Stern Gang, or Lehi, an extremist Zionist organization, is formed to fight against the British in the British-mandated territory of Palestine.
June 22, 1940	The French sign an armistice after their defeat by Germany in less than six weeks. British prime minister Winston Churchill announces that the battle of France is over; the battle of Britain is about to begin.
Aug., 1940	Germans begin the Battle of Britain, a series of air raids over Britain aimed at destroying British infrastructure and morale.
Nov. 10, 1940	The British Royal Navy produces a decisive aerial victory at Taranto Harbor, Italy, crippling the anchored Italian fleet with nighttime bomb and torpedo attacks.
1940-1969	During the vaccine development and stockpiling phase of biological warfare, there are open-air tests of biological dispersal in urban environments in the United States.
May 20, 1941	German parachutists land in Crete in the first mainly airborne invasion in history.
June, 1941	The Germans begin Operation Barbarossa, their invasion of Russia, advancing as far as Moscow and Leningrad.

1941	U.S. pilots form the Flying Tigers to assist the Chinese in fighting the Japanese.
July 25, 1941	Spanish volunteers form the Blue Division to fight on the eastern front in World War II.
Nov. 20, 1941	The Australian Army develops the Owen gun.
Dec. 7, 1941	The Japanese navy launches a morning surprise air raid against the U.S. fleet at Pearl Harbor, Hawaii, sinking or damaging several U.S. battleships and bringing the United States into World War II.
Jan. 20, 1942	During the Wannsee Conference, the Germans inaugurate plans for the Holocaust.
Feb. 15, 1942	Singapore falls to the Japanese.
Apr., 1942	Soviet leader Joseph Stalin discovers information about the U.S. nuclear program.
May, 1942	The Battle of the Coral Sea is the first naval battle fought entirely by carrier-based aircraft.
May, 1942	Navajo Indians are first used to transmit messages that cannot be decoded by the Japanese.
June 13, 1942	The United States forms the Office of Strategic Services (OSS), forerunner of the Central Intelligence Agency (CIA).
Aug., 1942-Jan., 1943	With the use of aerial resupply, the Russians withstand the German Siege of Stalingrad, marking the ultimate German failure on the Russian front.
Aug. 23, 1942	The Italian cavalry charge the Soviet artillery near the River Don in the last successful cavalry charge.
May 16-17, 1943	During the Dam Buster raids, the British Royal Air Force drops bouncing bombs on dams in Germany.
Apr. 19-May 16, 1943	Jews in the Warsaw Ghetto revolt against the Germans.
July, 1943	The Russians defeat the Germans at the Battle of Kursk, one of the largest tank battles in history.
1944	Germany launches the first long-range ballistic missiles, the V-1 and V-2, against England during World War II.
1944	The Japanese begin kamikaze attacks on Allied ships in the Pacific.
1944-1946	The AK-47, the Kalashnikov rifle, is developed in the Soviet Union.
June 6, 1944	On what is known as D day, the Allies begin an invasion of Normandy, France, the largest amphibious operation in history and the beginning of Allied victory in Europe.
June 13, 1944	The Germans fire the Fieseler Fi 103 (V-1) for the first time at London. It is later followed by the V-2 rocket bombs, used to strike terror in southern Britain.

Feb. 24-25, 1945	The U.S. Air Force firebombs Tokyo, and General Curtis LeMay promotes U.S. airpower.
Apr., 1945	In the last major amphibious offensive of World War II, U.S. forces invade Okinawa and, after meeting fierce resistance, seize the island from Japan.
Apr.-May, 1945	The Russians wage air, artillery, and tank attacks in the Battle for Berlin, which ultimately leads to German surrender.
June 26, 1945	Replacing the ineffective League of Nations, the United Nations is formed to mediate disputes between countries, providing a platform for dialogue.
July 16, 1945	The first atomic bomb is successfully tested at Alamogordo, New Mexico.
Aug. 6, 1945	The first atomic bomb to be used in war is dropped by the United States on the Japanese city of Hiroshima, killing more than 70,000 civilians and hastening the end of the war. Four days later, the second bomb was dropped on Nagasaki, killing 40,000.
Aug. 15, 1945	Emperor Hirohito announces the surrender of Japan.
1945	As World War II concludes, Indochinese Communist Party leader Ho Chi Minh proclaims a Democratic Republic of Vietnam, and France begins reasserting its colonial rule in Indochina.
1945	The International Court of Justice is established in The Hague by United Nations Charter.
1945-1946	An international tribunal to try Germans accused of war crimes is conducted at Nuremberg, establishing the concept of war crimes in international law.
1946	Air America is founded as a U.S. civilian airline. It is later revealed to be covertly owned and operated by the Central Intelligence Agency (CIA).
1946-1949	Civil war rages in China between Nationalist and Communist Party forces, resulting in the triumph of Communism and in Nationalist leader Chiang Kai-shek's flight to Taiwan.
Feb. 22, 1946	George F. Kennan's "Long Telegram" articulates the rationale behind Soviet aggression and advocates a firm U.S. response, with force if necessary, beginning the Cold War era.
July 22, 1946	King David's Hotel in Jerusalem is bombed, the first modern major bombing in the Middle East.
1947	The Kalashnikov AK-47 becomes the first widely deployed modern assault rifle.
Mar. 12, 1947	U.S. president Harry S. Truman introduces the Truman Doctrine, committing the United States to responsibility for defending global democracy—a clear signal that the United States intends to check Soviet expansion and influence.
Sept. 18, 1947	The Central Intelligence Agency is established.
Jan. 4, 1948	The assassination of Burmese independence leader Aung San is followed by an independent Burma.

Aug., 1949	The Soviet Union tests its first atomic bomb.
June 25, 1950	The Korean War begins, becoming the first conflict to involve the United Nations.
Sept. 15-19, 1950	U.N. soldiers under General Douglas MacArthur land at Inchon, the first major seaborne operation since D day.
1952	The world's first hydrogen bomb is exploded at Enewetak Atoll in the Pacific Ocean.
1953	The Soviet Union tests its first hydrogen bomb.
1954	The Geneva Conference, after discussions on the Korean War, calls for a partition of Indochina into four countries—North Vietnam, South Vietnam, Laos, and Cambodia—and for an election within two years to unify the two Vietnams.
1954	The USS *Nautilus*, the first nuclear-powered submarine, is commissioned.
1955	The United States starts actively supporting South Vietnam, taking over from the French.
1955	The first practical hovercraft is developed by Christopher Cockerell.
1956	The Chinook Boeing Vertol is designed as a U.S. Army medium-lift helicopter.
1956	The United States and the U.S.-backed South Vietnamese president, Ngo Dinh Diem, reject the Geneva-mandated reunification elections, knowing that the popular Ho Chi Minh would win.
July 26, 1956	The Suez Crisis leads to Egypt's capturing and nationalizing the Suez Canal Company.
Oct. 23-Nov. 10, 1956	The Hungarian Uprising resists the influence of the Soviet Union in Hungary.
1957	The Soviet Union successfully tests an intercontinental ballistic missile.
Oct. 4, 1957	The Soviet Union launches the world's first artificial Earth satellite, inaugurating the space race, sparking a reassessment of U.S. military and technological capabilities, and providing impetus for the development of both a space program and more sophisticated weapons-delivery systems.
1959-1970	Psychoactive chemical weapons are developed to produce hallucinations in exposed individuals.
Jan., 1959	Formation of the Viet Cong launches an armed struggle, backed by North Vietnam, against U.S. soldiers and South Vietnamese loyal to the Diem government.
Jan., 1960	U.S. president Dwight D. Eisenhower warns about the rise in the military-industrial complex.
July 11, 1960	Katanga tries to break away from the Congo.
1961	Agent Orange is used as a defoliant in the Vietnam War.

Oct. 14-26, 1962	A U.S. pilot takes pictures indicating that Soviets are placing missiles on Cuba. The ensuing Cuban Missile Crisis takes the world to the brink of nuclear war.
1963	The United States deploys Polaris submarine-launched missiles. The British introduce them in 1968.
May, 1963	The British manufacture the Chieftain Tank.
Oct. 7, 1963	The United States and the Soviet Union sign the Partial Test Ban Treaty.
Nov. 1, 1963	The South Vietnamese government of Ngo Dinh Diem precipitates instability in the country, leading to increased U.S. military involvement in the region. The assassination of John F. Kennedy three weeks later sees Lyndon B. Johnson becoming U.S. president.
1964	The People's Republic of China conducts its first successful nuclear weapons test.
1964	War in Congo involves the use of mercenaries, including "Mad" Mike Hoare.
1964	The Palestine Liberation Organization is founded.
1965	The United States pursues a policy of escalated military involvement in Vietnam.
Mar. 2, 1965	The U.S. Air Force begins Operation Rolling Thunder, which involves sustained bombing of North Vietnam.
1966	Mao Zedong initiates the decadelong Chinese Cultural Revolution to purge his opponents from the Communist Party and renew the people's revolutionary spirit.
Jan. 27, 1967	More than sixty (and later many more) countries sign the Outer Space Treaty, banning the use of outer space for warfare.
Apr., 1967	The Rapier surface-to-air missile is developed and manages to shoot down a Meteor drone.
May, 1967	Biafra's attempt to break away from Nigeria starts the Nigerian Civil War.
June 5, 1967	The Israeli Air Force (IAF) launches devastating surprise counter-air raids against threatening Arab nations, beginning the Six-Day War.
Oct. 21, 1967	Egypt sinks the Israeli destroyer *Eilat* with a Soviet Styx cruise missile.
1968	The Soviet Union invades Czechoslovakia, establishing the Brezhnev Doctrine of Soviet military domination over Warsaw Pact states.
Jan., 1968	The North Vietnamese and Viet Cong launch the Tet Offensive, which, although unsuccessful, contradicts U.S. reports that a decisive end to the war is near at hand.
Jan. 23, 1968	The North Korean navy captures the USS *Pueblo*, according to U.S. Navy intelligence.
Mar. 18, 1969	The United States starts secret bombings of Cambodia during Operation Menu, in an attempt to destroy the Ho Chi Minh Trail.

1969-present	During the genetic engineering phase of biological warfare, recombinant DNA biotechnology opens new frontiers in the design and production of biological weapons.
1970-1979	During an era of détente, stable relations, relative to the earlier Cold War, prevail between the Soviet Union and the United States and their respective allies.
1970-present	Binary chemical weapons, stored and shipped in their component parts, are developed to allow chemical weapons to be safely transported to deployment sites.
Mar. 31, 1971	The British deploy Poseidon submarine-launched missiles.
1973	The last American fighting forces withdraw from Vietnam in late March, following a January 27 peace agreement.
Oct. 6, 1973	Egypt launches an air strike against Israel, beginning Arab-Israeli October War, also known as the Yom Kippur War.
May 18, 1974	India tests its first atomic bomb, known as the "Smiling Buddha."
Jan., 1975	The Cambodian Communists (Khmer Rouge) massacre the entire population of the town of Ang Snuol, after capturing it.
Apr. 17, 1975	The fall of Phnom Penh, the Cambodian capital, is accompanied by the rising rule of the Khmer Rouge.
Apr. 30, 1975	Saigon finally falls to the North Vietnamese forces, and Vietnam is united under communist rule following a referendum held the following year.
1976	The emergence of Khun Sa and his private army in northern Burma is financed by drug sales.
May, 1976	The Liberation Tigers of Tamil Elam (known as the Tamil Tigers) emerge in Sri Lanka.
July 4, 1976	Israeli commandos storm the old terminal building at Entebbe International Airport, Uganda, freeing Israeli hostages in one of the most daring antiterrorist raids of the modern era.
1978	The United States develops the Abrams tank, named after General Creighton Abrams, U.S. Army chief of staff and commander of the U.S. military forces in South Vietnam from 1968 until 1972. The U.S. military begins using it in 1980.
1978	The United States begins production of the first precision-guided artillery munitions.
May 13, 1978	Ex-Congo mercenary Bob Denard takes the Comoros Islands.
Dec., 1978	Vietnam invades Cambodia, capturing the vast majority of the country in two weeks, and establishes the People's Republic of Kampuchea.
1979	Soviet forces enter Afghanistan ostensibly to overthrow the government of Prime Minister Hafizullah Amin and install a puppet government loyal to Moscow.

1979	The Iranian Revolution ends Iran's close military ties with the United States and replaces the shah's regime with an Islamic theocracy.
Feb. 17-Mar. 16, 1979	Chinese soldiers invade northern Vietnam. The war quickly ends in a stalemate, and subsequently the Chinese government overhauls its army structure.
Oct., 1979	The British replace Poseidon submarine-launched missiles with Trident missiles.
Jan. 23, 1980	After an Iranian mob takes over the U.S. embassy, taking hostages, and the Soviet Union invades Afghanistan, U.S. president Jimmy Carter declares that the United States will consider any threat against the Persian Gulf a threat against its vital interests and will react, if necessary, with military force. The so-called Iranian hostage crisis ensues.
1981	Demonstrations against U.S. cruise missiles start at Greenham Common in England.
Mar., 1981	The Soviets launch their first well-planned offensive in Afghanistan, inaugurating the decadelong Soviet-Afghan War.
1982	Hezbollah, the "Party of God," forms in Lebanon.
May 4, 1982	The firing of an Exocet missile, manufactured by the French, by the Argentine air force against the British HMS *Sheffield* leads to major changes in British naval tactics during the Falklands War.
June 13-14, 1982	British soldiers on the Falkland Islands charge Argentines at the Battle of Mount Tumbledown, the last successful bayonet charge until 2004.
Mar. 11, 1985	Mikhail Gorbachev is chosen as the new general secretary of the Soviet Communist Party, and his reforms initiate a thaw in relations between the Soviet Union and the United States.
July 28, 1986	Soviet leader Mikhail Gorbachev announces a limited withdrawal of Soviet troops from Afghanistan.
Dec. 8, 1987	The first intifada between Palestinians and Israelis begins.
Dec. 8, 1987	U.S. president Ronald Reagan and Soviet general secretary Gorbachev sign the Intermediate Nuclear Forces (INF) Treaty, which calls for the destruction of U.S. and Soviet missiles and nuclear weapons.
Mar. 16, 1988	In Iraq, Saddam Hussein uses nerve gas against the Kurds in Halabja.
Dec. 21, 1988	After Pan American Flight 103 explodes over Lockerbie, Scotland, killing hundreds, state terrorism mounted by Libya is blamed.
1989	The Afghan Interim Government (AIG) is established, and the Soviet Union completes its withdrawal from Afghanistan.
1989	Gorbachev is elected Soviet president in the first pluralist elections since 1917, and by the end of the year all Warsaw Pact nations have overthrown their communist leadership.

1989	The dismantling of Germany's Berlin Wall signifies the end of the Cold War, as U.S president George H. W. Bush promises economic aid to the Soviet Union.
1989	Vietnam announces the withdrawal of all its soldiers from Cambodia.
July 17, 1989	The first flight of the Stealth bomber, made by Northrop Corporation and Northrop Grumman, herald's the aircraft's role in combat after April, 1997.
Jan. 17, 1991	A U.S.-led U.N. coalition leads a well-orchestrated air attack against Iraqi dictator Saddam Hussein in an effort to oust his forces from Kuwait, which he invaded in the summer of 1990.
Jan. 18, 1991	U.S. Patriot missiles are used in combat against Scud missiles fired by Iraq at Saudi Arabia during the First Gulf War.
Feb., 1991	U.N. forces undertake a decisive ground assault on Iraqi positions in Kuwait.
Apr., 1991	No-fly zones are established and enforced in Iraq to prevent repression of Kurds in northern Iraq.
1991	After the Baltic states of Estonia, Latvia, and Lithuania are granted independence and other former soviets join the Commonwealth of Independent States, Gorbachev resigns as president and the Soviet Union is officially dissolved.
Feb. 26, 1993	A bomb attack on New York's World Trade Center kills 6 people and injures more than 1,000.
May 25, 1993	The International Criminal Tribunal for the former Yugoslavia is established at The Hague, following passage of Resolution 827 by the United Nations Security Council.
1994	The Australian company Metal Storm forms to develop machine guns and electronically initiated superimposed-load weapons technology.
1995	The April bombing of a federal office building in Oklahoma City, Oklahoma, by one or more individuals allegedly affiliated with militia groups kills 168. Within the same week, the Japanese religious cult Aum Shinrikyo mounts a sarin gas attack in a Tokyo subway, hospitalizing 400.
1996	Millionaire Islamic extremist Osama Bin Laden issues a declaration of war against the United States.
Jan., 1996	An international force composed largely of troops under the auspices of the North Atlantic Treaty Organization (NATO) is deployed in Bosnia to ensure the implementation of the Dayton Accords.
1998	Pakistan successfully tests its first fission device.
Aug. 7, 1998	The simultaneous bombings of U.S. embassies in Kenya and Tanzania in August kill 224, and Osama Bin Laden's supporters are suspected. Shortly thereafter, the United States conducts a counterattack against Bin Laden's training base in Afghanistan.

2000	The October 12 suicide bombing of the USS *Cole* in the Persian Gulf kills 17 sailors.
Aug. 12, 2000	During a Russian naval exercise, the *Kursk* submarine sinks.
Apr., 2001	A U.S. spy plane is brought down over China in the Hainan Island incident.
Sept. 11, 2001	Two hijacked planes are deliberately crashed into the World Trade Center in New York, another is crashed into the Pentagon, and a fourth crashes in a field in Pennsylvania, in a coordinated series of attacks organized by Osama Bin Laden's terrorist group al-Qaeda.
Oct. 7, 2001	U.S. president George W. Bush announces the start of the War on Terrorism in response to the September 11, 2001, attacks on U.S. soil. A U.S.-led invasion of Afghanistan starts to bring down the Taliban government of the country that has been harboring Osama bin Laden.
Mar. 20-May 1, 2003	A U.S.-led invasion of Iraq topples Saddam Hussein. Justification for the Bush administration's preemptive strike, previously presented before the United Nations, includes controversial and, some maintain, poorly substantiated evidence that the Iraqi dictator is refusing to be transparent about programs to develop weapons of mass destruction and suspected use of Iraqi soil to provide terrorist groups with safe harbor.
2003-2009	Fighting in the Darfur region leads to atrocities and severe humanitarian problems for the people of southern Sudan.
Oct. 15, 2003	Yang Liwei becomes the first Chinese taikonaut in space.
2004	An attempt to overthrow the government of Equatorial Guinea is executed by mercenaries hired in South Africa.
Oct. 9, 2006	The North Korean government issues an announcement that it has successfully conducted its first nuclear test.
Aug., 2008	A brief war erupts between the Russian Federation and Georgia over South Ossetia.
Jan. 22, 2009	On his second day in office, U.S. president Barack Obama issues an executive order to close the terrorist detention camp at Guantánamo Bay, Cuba.
Mar. 4, 2009	The International Criminal Court (ICC) issues a warrant for the arrest of Sudanese president Omar Hassan al-Bashir for war crimes, in its first action against a head of state since the ICC's founding in 2002.
May 18, 2009	The Sri Lankan Civil War ends folllowing more than a quarter century of conflict.
May 27, 2009	After conducting nuclear tests, North Korea issues an announcement stating that it is no longer bound by the 1953 armistice it signed at the end of the Korean War. The United Nations issues sanctions in mid-June, in response to which North Korea promises to step up its weaponization of plutonium.

Bibliography

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Diagram Group. *Weapons: An International Encyclopedia from 5000 B.C. to 2000 A.D.* New York: St. Martin's Press, 1980. A profusely illustrated, folio-sized reference work featuring all types of weapons developed in all cultures over seven thousand years. [ill, glo, B, i]

Echevarris, Antulio J., II. *Imagining Future War: The West Technological Revolution and Visions of Wars to Come, 1880-1914*. Westport, Conn.: Praeger Security International, 2007. A short history and analysis of the changes in warfare in the three decades before World War I. [ill, B, i]

Elgood, Robert. *The Arms and Armour of Arabia in the Eighteenth, Nineteenth, and Twentieth Centuries*. New York: Scholar, 1994. A folio-sized, profusely illustrated survey of Islamic arms. [ill, app, glo, B, i]

Fuller, J. F. C. *The Decisive Battles of the Western World*. London: Eyre & Spottiswoode, 1954. A detailed account of thirty-four battles from Salamis to D day, by a leading British military authority. [M, B, i]

Glete, Jan. *Navies and Nations: Warships, Navies, and State Building in Europe and America, 1500-1860*. 2 vols. Stockholm, Sweden: Almqvist, 1993. A comprehensive and definitive reassessment by a remarkable Swedish scholar of the role of naval warfare in the development of hegemonic expansive powers of Europe and America; a multinational review and comparison in statistical and quantitative detail of twelve major and more than forty minor navies during the period. [ill, tab, B, i]

_____. *Warfare at Sea, 1500-1650: Maritime Conflicts and the Transformation of Europe*. London: Routledge, 2000. A brilliant synthesis incorporating themes of naval technology, tactics, strategy, personnel, administration, logistics, and national states as related to maritime wars during the early modern period. [M, B, i]

Hall, Bert S. *Weapons and Warfare in Renaissance Europe: Gunpowder, Technology, and Tactics*. Baltimore: Johns Hopkins University Press, 1997. A discussion of gunpowder as a catalyst for historical change and related technological developments in gun casting and gun carriages. [ill, M, B, i]

Hanson, Victor D., ed. *Hoplites: The Classical Greek Battle Experience*. London: Routledge, 1991. Papers by experts on ancient warfare, covering men and weapons, battlefield environment, and rules of war. [ill, B, i]

Harkavy, Robert E., and Stephanie G. Neuman. *Warfare and the Third World*. New York: Palgrave, 2001. A survey of the nature of warfare in the Third World from the end of the Cold War. [B, i]

Haythornthwaite, Philip J. *The Colonial Wars Source Book*. London: Arms & Armour, 1995. A detailed

reference work that includes vast amounts of information on colonial wars, colonial armies, and weapons in use at the time, as well as biographies of the major figures involved. [ill, M, tab, chr, glo, B, i]

_____. *The Napoleonic Souce Book*. London: Arms & Armour, 1990. An important reference work on the Napoleonic Wars, starting with a general survey and then covering (alphabetically) all involved countries, the types of weapons used by them, and biographies of the major commanders, with copious illustrations and quotations from original sources. [ill, M, tab, chr, glo, B, i]

_____. *The World War I Source Book*. London: Arms & Armour, 1992. Like others in this series, this book provides much detail on the armies involved in the conflict, as well as the political background to their involvement and then the nature of the fighting and the weaponry and biographies of the important commanders, as well as a detailed list of contemporary and secondary source material. [ill, M, tab, chr, glo, B, i]

Haywood, John. *Dark Age Naval Power: A Reassessment of the Frankish and Anglo-Saxon Seafaring Activity*. London: Routledge, 1991. A look at a neglected subject: the impressive maritime achievements of Germanic seafarers before the Vikings, with coverage of warfare, piracy, migration, and trade. [ill, M, glo, B, i]

Headrick, Daniel R. *Tools of Empire: Technology and European Imperialism in the Nineteenth Century*. New York: Oxford University Press, 1981. A discussion of nineteenth century imperialism as facilitated by innovations in technology such as steamships, submarine cables, guns, and gunboats. [B]

Hedges, Chris. *What Every Person Should Know About War*. New York: Free Press, 2003. A short overview of warfare in the post-Cold War period. [B, i]

Hogg, O. F. G. *The Royal Arsenal: Its Background, Origin, and Subsequent History*. 2 vols. New York: Oxford University Press, 1963. A comprehensive and heavily documented history of the British ordnance industry since the eleventh century. [ill, app, B]

Holsinger, M. Paul, ed. *War and American Popular Culture: A Historical Encyclopedia*. Westport, Conn.: Greenwood Press, 1999. A large and detailed encyclopedia including not only conflicts within the United States but also those overseas involving the U.S. armed forces, such as Korea, Vietnam, and other conflicts after 1975. [ill, B, i]

Howard, Howard E., ed. *The Theory and Practice of War*. New York: Praeger, 1965. A series of fifteen essays dedicated to Basil Liddell Hart, written by noted scholars such as Peter Paret, Gordon Craig, Jay Luvaas, Brian Bond, Norman Gibbs, and Henry Kissinger. [B]

Ion, A. Hamish, and Keith Neilson, eds. *Elite Military Formations in War and Peace*. Westport, Conn.: Praeger, 1996. A series of seven scholarly presentations of the history of special units from ancient times to the present. [B, i]

Isby, David C., and Charles Kamps, Jr. *Armies of NATO's Central Front*. London: Jane's Publishing Company Limited, 1985. A detailed survey of the military forces of the member countries of the North Atlantic Treaty Organization in the last part of the Cold War. [ill, i]

Jensen, Geoffrey, and Andrew Wiest, eds. *War in the Age of Technology: Myriad Faces of Modern Armed Conflict*. New York: New York University Press, 2001. An analysis of how warfare has changed from the end of the Cold War and the increasing importance of technology. [B, i]

Jones, Archer. *The Art of War in the Western World*. London: Harrap, 1987. An overview of twenty-five hundred years of land-based warfare in the West from the social-history perspective, with a focus on institutions, comparative analysis, and interactions. [ill, tab, M, B, i]

Jordan, Gerald, ed. *Naval Warfare in the Twentieth Century, 1900-1945*. New York: Russak, 1977. Thirteen essays in honor of Arthur Marder, by noted scholars such as Paul Kennedy, on John Fisher and Alfred von Tirpitz; Robin Higham, on peripheral weapons; Peter Gretton, on U-boats; Sadao Asada, on Japanese admirals; and W. A. B. Douglas, on the Canadian navy. [B]

Keegan, John, ed. *The Book of War: Twenty-five Centuries of Great War Writing*. London: Viking,

1999. A collection of eighty-two contemporary accounts from Thucydides to Desert Storm. [B, i]

Keen, Maurice, ed. *Medieval Warfare: A History*. New York: Oxford University Press, 1999. Twelve expert historians on methods of warfare from 700 to 1500, including H. B. Clarke on the Vikings, Clifford Rogers on the Hundred Years' War, and Felipe Fernandez-Armesto on naval warfare. [ill, M, B, i]

Kierman, Frank A., and J. K. Fairbank, eds. *The Chinese Ways in Warfare*. Cambridge, Mass.: Harvard University Press, 1974. A historical survey focusing on distinctive elements in Chinese warfare. [ill, B]

Kightly, Charles. *Strongholds of the Realm: Defenses in Britain from Prehistory to the Twentieth Century*. New York: Thames, 1979. A history of fortresses from early times to the present. [ill, B, i]

Laffin, John. *Brassey's Battles: Thirty-five Hundred Years of Conflicts, Campaigns, and Wars from A-Z*. New York: Barnes & Noble Books, 1995. A substantial alphabetical survey of seven thousand battles, campaigns, and wars. [ill, M, i]

Lynn, John A., ed. *Feeding Mars: Logistics in Western Warfare from the Middle Ages to the Present*. Boulder, Colo.: Westview Press, 1993. A dozen articles by expert scholars, such as Lynn, on Martin van Creveld's *Supplying War*; Bernard Bachrach, on logistics for the Crusades; Jon Sumida, on British industrial logistics and naval war production during World War I; and Timothy Runyan, on naval logistics during the Hundred Years' War. [B, i]

_____, ed. *Tools of War: Instruments of Warfare, 1445-1871*. Urbana: University of Illinois Press, 1990. A series of papers from a conference on how weapons shaped military thought and organization of armed forces, including Simon Adams on the late sixteenth century Habsburg hegemony, William Maltby on sailing ship tactics, Dennis Showalter on the Prussian army, and Hew Strachan on the British army. [B, i]

McElwee, William L. *The Art of War: Waterloo to Mons*. Bloomington: Indiana University Press, 1974. A general survey. [M, B, i]

McInnes, Colin J., and G. D. Sheffield, eds. *Warfare in the Twentieth Century: Theory and Practice*. Boston: Allen & Unwin, 1988. Nine essays by expert scholars, including McInnes, on nuclear strategy; Keith Jeffery, on colonial warfare; and Geoffrey Till, on naval power. [B, i]

Macksey, Kenneth. *For Want of a Nail: The Impact on War of Logistics and Communications*. Washington, D.C.: Brassey's, 1989. A study of technological developments in the fields of logistics and communications and their impact on warfare. [ill, M, B, i]

_____. *Technology and War: The Impact of Science on Weapon Development and Modern Battle*. London: Arms & Armour, 1986. Accounts of how science and scientific developments have influenced weaponry. [ill, i]

McNeill, William H. *The Age of Gunpowder Empires, 1450-1800*. Washington, D.C.: American Historical Association, 1989. An informative guide by an outstanding scholar on the role of gunpowder in imperial expansion. [B]

_____. *The Pursuit of Power: Technology, Armed Force, and Society Since 1000*. Chicago: University of Chicago Press, 1982. One volume in a trilogy by the premier scholar on world history, extending the concept of the military-industrial complex back several centuries to 1000 and presenting its practical and far-reaching impact on world society. [B, i]

Mallet, M. E., and J. R. Hale. *The Military Organization of a Renaissance State: Venice, 1400-1617*. New York: Cambridge University Press, 1984. A history of one of the earliest, and most innovative and formative, military states, including coverage of its standing army, the institutionalization of its armed forces, its galley navy, and its famous arsenal. [ill, M, app, B, i]

Messenger, Charles. *The Century of Warfare: Worldwide Conflict from 1900 to the Present Day*. London: HarperCollins, 1995. A detailed overview of changes in warfare during the twentieth century based on the television documentary series of the same name. [ill, M, B, i]

Millett, Allan R., and Williamson Murray, eds. *Military Effectiveness*. 3 vols. Boston: Allen & Unwin, 1988. Twenty-four eminent scholars systemati-

cally assess twenty-one comparative case studies of military performance in similar categories—political, operational, strategic, and tactical—for three designated periods: World War I, the interwar years, and World War II. [ill, M, B, i]

Moulton, James L. *A Study of Warfare in Three Dimensions: The Norwegian Campaign of 1940*. Athens: Ohio University Press, 1966. A participant's contention that the Norwegian Campaign of 1940 was the first major campaign with operations on the surface, subsurface, and in the air. [ill, M, B, i]

Murray, Williamson, and Allan R. Millett. *A War to Be Won: Fighting the Second World War*. Cambridge, Mass.: Harvard University Press, 2000. A substantial survey of World War II, focusing on traditional military operations on the battlefield and assessing commanders such as Douglas MacArthur, Omar N. Bradley, Chester W. Nimitz, and First Viscount Slim, categorized from bad to best. [ill, M, B, i]

Nicolle, David. *Medieval Warfare Source Book: Christian Europe and Its Neighbours*. London: Brockhampton Press, 1996. One of two volumes in an important reference book covering medieval warfare over various time periods, with copious illustrations, and original source material covering Europe and also the Crusades, and Central Asia. [ill, M, tab, chr, glo, B, i]

_____. *Medieval Warfare Source Book: Warfare in Western Christendom*. London: Brockhampton Press, 1999. The second volume of Nicolle's reference work covering warfare within Europe, arranged chronologically. [ill, M, tab, chr, glo, B, i]

Norman, Vesey B., and Don Pottinger. *A History of War and Weapons, 449-1660: English Warfare from the Anglo-Saxons to Cromwell*. New York: Prentice-Hall, 1966. A survey of medieval warfare, exclusive of naval warfare, aimed at the introductory student. [ill, i]

Oakeshott, R. Ewart. *European Weapons and Armour: From the Renaissance to the Industrial Revolution*. Rochester, N.Y.: Boydell Press, 2000. A general survey. [ill, B, i]

O'Connell, Robert L. *Of Arms and Men: A History of War, Weapons, and Aggression*. New York: Oxford University Press, 1989. A general review of the development of weapons, with the observation that military leaders disliked revolutionary breakthroughs in weaponry. [ill, B, i]

Partington, J. R. *A History of Greek Fire and Gunpowder*. Baltimore: Johns Hopkins University Press, 1960, 1998. A study of how these pyrotechnics and firearms went from China to the Mediterranean through the Muslim world. [ill, tab, glo, B, i]

Payne, Samuel B. *The Conduct of War: An Introduction to Modern Warfare*. Oxford, England: Blackwell, 1989. A survey of contemporary warfare, including nuclear war; conventional land war, sea, and air actions; and guerrilla warfare. [ill, B, i]

Perrett, Bryan. *The Battle Book: Crucial Conflicts in History from 1469 B.C. to the Present*. New York: Sterling, 1996. An easy-to-use, encyclopedic guide covering 566 battles during more than three thousand years of warfare. [B]

Pollington, Stephen. *The Warrior's Way: England in the Viking Age*. New York: Sterling, 1990. A nicely illustrated, folio-sized volume covering the period from Alfred the Great to William the Conqueror. [ill, app, M, B, i]

Porter, Bruce D. *War and the Rise of the State: The Military Foundations of Modern Politics*. New York: Free Press, 1994. An important synthesis of the increasingly popular topic of war and state formation, exclusive of the United States, delineating dynastic, national, collectivist, and totalitarian state patterns. [B, i]

Porter, Patrick. *Military Orientalism: Eastern War Through Western Eyes*. New York: Columbia University Press, 2009. An account illustrating different techniques of fighting and how this has transformed thinking with different forms of asymmetrical warfare. [B, i]

Quick, John. *Dictionary of Weapons and Military Terms*. New York: McGraw-Hill, 1973. A profusely illustrated, folio-sized dictionary defining thousands of terms. [ill, B]

Ralston, David B. *Importing the European Army: The Introduction of European Military Techniques and Institutions into the Extra-European World, 1600-1914*. Chicago: University of Chi-

cago Press, 1990. This book covers the transfer of European technology within Africa, the Middle East, and elsewhere, and the changes which have resulted. [B, i]

Reardon, Carol. *Soldiers and Scholars: The U.S. Army and the Uses of Military History, 1865-1920*. Lawrence: University of Kansas Press, 1990. A description of the process of professionalization within the U.S. Army, from an author with an outstanding record of historical writing. [B, i]

Roth, Jonathan P. *War and World History*. Chantilly, Va.: The Teaching Company, 2009. Presented by the well-known military historian and director of the University of Calilfornia's Burdick Military History Project, these forty-eight lectures, captured on individual DVDs, cover such topics as "The Stone Age War," "The Chariot Revolution," "Monotheisms and Militaries," "The Weaponization of Information," and "The Struggle for Peace and Justice."

Southworth, Samuel A., ed. *Great Raids in History: From Drake to Desert One*. New York: Sarpedon, 1997. Accounts of nineteen small-unit, irregular warfare actions, both failed and successful, during the last four hundred years, including raids by or identified with Sir Francis Drake, George A. Custer, Jimmy Carter, and Benjamin Netanyahu. [B, i]

Stewart, Richard W. *The English Ordnance Office, 1585-1625: A Case Study in Bureaucracy*. Rochester, N.Y.: Boydell Press, 1996. An outstanding example of the importance of logistics in warfare, a case study of England's supply of all ordnance facilities to all services during a formative period. [tab, B, i]

Stradling, R. A. *The Armada of Flanders: Spanish Maritime Policy and European War, 1568-1668*. New York: Cambridge University Press, 1992. A thesis that proposes that Spanish arms at sea in the long war against the Dutch produced a change in the nature of warfare at sea; key factors were the use of Dunkirk as base, the frigate warship, the process of prize taking, and even the wages of seamen. [tab, glo, app, M, B, i]

Thompson, Julian. *The Lifeblood of War: Logistics in Armed Conflict*. Washington, D.C.: Brassey's, 1991. Presents eight case studies to form a comprehensive analysis of this vital aspect of war, including North Africa, Italy, and Burma in World War II; Korea; Vietnam; the Arab-Israeli October War; and the Falkland Islands, the latter reported from firsthand participation. [ill, M, B, i]

Thompson, Sir Robert, ed. *War in Peace: An Analysis of Warfare from 1945 to the Present Day*. London: Orbis, 1985. A detailed study by the British counterinsurgency expert who advised successfully on the Malayan Emergency, and later advised the United States on Vietnam. [ill, M. B, i]

Townshend, Charles, ed. *The Oxford Illustrated History of Modern War*. New York: Oxford University Press, 1997. A beautifully illustrated collection of stimulating essays by prominent authorities, such as Richard Overy, Richard Holmes, and Martin van Creveld. [ill, M, B, i]

Toy, Sidney. *Castles: Their Construction and History*. 1939. Reprint. Mineola, N.Y.: Dover, 1985. A survey of the general characteristics and history of castles, with examples. [ill, B, i]

_____. *A History of Fortification from 3000 B.C. to A.D. 1700*. New York: Macmillan, 1955. A popular history presenting a general overview covering five thousand years. [ill]

Unger, Richard W. *The Ship in the Medieval Economy, 600-1600*. London: Croom Helm, 1980. A comprehensive and highly technical survey based primarily upon extensive discoveries in underwater archaeology, a relatively new discipline that has contributed vastly to knowledge in this field. Stresses the economic, social, and cultural aspects of ship design and how developments stimulated commercial, military, and imperial expansion. [ill, B, i]

Unsworth, Michael E., ed. *Military Periodicals: United States and Selected International Journals and Newspapers*. Westport, Conn.: Greenwood Press, 1990. A comprehensive reference guide to military journals and periodicals such as *Armed Forces and Society, Proceedings of the Naval Institute, Royal United Services Institute Journal, Air Power History, Aviation Week*, and *Space Technology*. [chr, app, i]

Van Creveld, Martin L. *Supplying War: Logistics*

from Wallenstein to Patton. New York: Cambridge University Press, 1977. A provocative early analysis from an innovative and controversial author, an Israeli professor who contends that logistics is nine-tenths of the business of war. [M, B, i]

_____. *Technology and War: From 2000 B.C. to the Present*. New York: Free Press, 1989. A survey of dramatic changes in warfare over four thousand years due to advances in technology, concentrating on the systematization of war and its increasing remoteness from reality; divided into chronological sections such as the age of tools, the age of machines, the age of systems, and the age of automation. [ill, B, i]

_____. *The Transformation of War*. New York: Maxwell Macmillan International, 1991. An account of the changes in warfare at the end of the Cold War. [B, i]

Verbruggen, J. F. *The Art of Warfare in Western Europe During the Middle Ages from the Eighth Century to 1340*. Translated by Sumner Willard and Mrs. R. W. Southern. 2d rev. ed. Rochester, N.Y.: Boydell Press, 1998. A classic by a noted Belgian scholar of land warfare, featuring warfare of knights and foot soldiers and their tactics and strategies. [ill]

Warner, Philip. *Firepower: From Slings to Star Wars*. London: Grafton Books, 1988. A good general history about the invention and use of new weaponry. [ill, B, i]

Wright, Quincy. *A Study of War: An Analysis of the Causes, Nature, and Control of War*. Chicago: University of Chicago Press, 1942. An encyclopedic and monumental study, with brilliant observations and analyses, originally formulated in the 1920's but updated during World War II. [ill, tab, app, B, i]

MILITARY THEORY AND STRATEGY

Albion, Robert G. *Makers of Naval Policy, 1798-1947*. Edited by Rowena Reed. Annapolis, Md.: Naval Institute Press, 1980. An official study of the making of naval administration and policy for the United States up until the time of amalgamation of the armed services. [B, i]

Armitage, M. J., and R. A. M. Mason, eds. *Air Power in the Nuclear Age: Theory and Practice*. London: Macmillan, 1983. Nine essays assessing the role of airpower during the Cold War. [B, i]

Asprey, Robert B. *War in the Shadows: The Guerrilla in History*. 2 vols. Garden City, N.Y.: Doubleday, 1975. Rev. ed. Boston: Little, Brown, 1994. The classic history describing dozens of instances of the employment of irregular forces in conjunction with a larger political-military strategy. [M, B, i]

Bacon, Benjamin W. *Sinews of War: How Technology, Industry, and Transportation Won the Civil War*. Novato, Calif.: Presidio Press, 1997. An account of how the Union created and sustained a logistical advantage during the American Civil War. [ill, i]

Ball, Desmond, and Jeffrey Richel, eds. *Strategic Nuclear Targeting*. Ithaca, N.Y.: Cornell University Press, 1986. A description of an essential aspect of nuclear weapons development, covering, for example, the Single Integrated Plan formulated by the United States. [ill, M, B, i]

Barker, A. J. *Suicide Weapon: Japanese Kamikaze Forces in World War II*. New York: Ballantine, 1971. A study of the variety of kamikaze forces, including aircraft, submarines, and entire fleets, used during and especially toward the end of World War II. [ill, B]

Bartlett, Merrill L., ed. *Assault from the Sea: Essays on the History of Amphibious Warfare*. Annapolis, Md.: Naval Institute Press, 1983. Fifty articles describing amphibious campaigns, such as the Norman Conquest, the Mongols against Japan, Gallipoli, Dieppe, and the Falkland Islands. [ill, B]

Bartusis, Mark C. *The Late Byzantine Army: Arms and Society, 1204-1453*. Philadelphia: University of Pennsylvania Press, 1992. A synthesis describing military institutions of Byzantium from the Fourth Crusade until the empire's fall to the Ottoman Turks. [ill, M, tab, glo, B, i]

Bateman, Robert L., ed. *Digital War: A View from the Front Lines*. Novato, Calif.: Presidio Press, 1999. Eight essays by experts on the strategy and

tactics for the "digital battlefield." [tab, B]

Beaumont, Roger A. *Military Elites: Special Fighting Units in the Modern World*. Indianapolis, Ind.: Bobbs-Merrill, 1974. A study of several modern elite units, including the French Foreign Legion, the Green Berets, and Combined Operation Headquarters. [ill, B, i]

Bellamy, Chris. *The Evolution of Modern Land Warfare: Theory and Practice*. London: Routledge, 1990. An analysis of land warfare at the very end of the Cold War. [ill, B, i]

Bidwell, Shelford, and Dominick Graham. *Fire-Power: British Army Weapons and Theories of War, 1904-1945*. Boston: Allen & Unwin, 1982. A description of the process aimed to link together artillery, infantry, tactical air, and communication, all to create a doctrine leading to effective command and control. [ill, M, B, i]

Brodie, Bernard. *A Layman's Guide to Naval Strategy*. Princeton, N.J.: Princeton University Press, 1943. A classic text on sea power, tools, command of the sea, bases, and the air arm. [ill, M, B, i]

_____. *Strategy in a Missile Age*. 1959. Reprint. Princeton, N.J.: Princeton University Press, 1965. An early analysis of the significance of the nuclear age, pointing out the danger of precipitating total war. [B]

Chaliand, Gerard, ed. *Guerrilla Strategies: An Historical Anthology from the Long March to Afghanistan*. Berkeley: University of California Press, 1982. A collection of case studies—for example, Burma, China, Cuba, South Africa, and Yugoslavia. [B]

Colomb, Philip H. *Naval Warfare: Its Ruling Principles and Practice Historically Treated*. 3d ed. London: W. H. Allen, 1891. Reprint. Annapolis, Md.: Naval Institute Press, 1990. An early treatise on the strategic implications of the study of naval history to demonstrate certain laws governing naval warfare. [ill, tab, M]

Corbett, Julian S. *Some Principles of Maritime Strategy*. New York: Longmans, Green, 1911. Reprint. Annapolis, Md.: Naval Institute Press, 1988. A treatise seen by some experts as the most appropriate and important of all relating to naval, and even national, strategy. [ill, B, i]

Corum, James S. *The Luftwaffe: Creating the Operational Air War, 1918-1940*. Lawrence: University of Kansas Press, 1997. A German perspective on air warfare.

Cox, Sebastian, ed. *The Strategic Air War Against Germany, 1939-1945: The Official Report of the British Bombing Survey Unit*. London: Cass, 1998. An extensive British investigation, originally withheld, now published, into controversial strategic bombing. [ill, B, i]

Douhet, Giulio. *The Command of the Air*. Translated by Dino Ferrari. New York: Coward, 1921. A treatise by the Italian officer, the original theorist and advocate of airpower. [B]

Ellis, John. *Brute Force: Allied Strategy and Tactics in the Second World War*. New York: Viking, 1990. A revisionist assessment positing that the Allies won the war because of industrial capacity only and that Allied commanders were incapable of effective warfare. [tab, app, M, B, i]

Gat, Azar. *The Development of Military Thought: The Nineteenth Century*. Oxford, England: Clarendon, 1992. A continuation of the author's *The Origins of Military Thought*, about strategy and military theory during the nineteenth century, in which the French Revolution introduced a new mode of warfare, Prussia and the mass army developed, and total war began to be anticipated. [B, i]

_____. *The Origins of Military Thought: From the Enlightenment to Clausewitz*. Oxford, England: Clarendon, 1989. An examination of how conceptions of military theory emerged from the Enlightenment and Counter-Enlightenment. [B, i]

Gray, Colin S. *Strategy for Chaos: Revolutions in Military Affairs and the Evidence of History*. Portland, Oreg.: Frank Cass, 2002. Conceptually analyzes the idea of "revolutions in military affairs," the adoption of wholesale changes in military strategies by numerous or important nations, comparing the changes that took place during the Napoleonic Era, World War I, and the nuclear era as context for the revolution taking place in the 1990's and 2000's due to the application of information technology to warfare. [B, i]

Guilmartin, John F. *Gunpowder and Galleys: Chang-*

ing Technology and Mediterranean Warfare at Sea in the Sixteenth Century. New York: Cambridge University Press, 1974. A look at how the sixteenth century domination of the galley over the Mediterranean culminated in the Battle of Lepanto (1571) and how the development of gunpowder and heavy cannons contributed to the decline of southern, and the rise of northern, Europe. [ill, B, i]

Hague, Arnold. *The Allied Convoy System, 1939-1945: Its Organization, Defence, and Operation*. Annapolis, Md.: Naval Institute Press, 2000. An intensive study based on convoy records. [ill, B, i]

Handel, Michael I. *Masters of War: Classical Strategic Thought*. 1992. 3d ed. London: Cass, 2000. A detailed textual analysis of the great military strategists, such as Sunzi (Sun Tzu); Niccolò Machiavelli; Carl von Clausewitz; Antoine Henri, baron de Jomini; and Mao Zedong (Mao Tse-tung). [tab, M, B, i]

Hanzhang, Tao. *Sun Tzu's "Art of War": The Modern Chinese Interpretation*. Translated by Yuan Sibling. New York: Sterling, 2000. The classical work on military affairs, dealing with war, politics, economics, diplomacy, geography, and astronomy. [ill, M, i]

Hawkes, Sonia Chadwick, ed. *Weapons and Warfare in Anglo-Saxon England*. New York: Oxford University Press, 1989. A collection of papers by experts from several disciplines, including history, archaeology, anthropology, and metallurgy. [ill, B, i]

Honan, William H. *Bywater: The Man Who Invented the Pacific War*. London: Macdonald, 1990. A detailed account of the Bywater plan, outlined in a number of books, on the strategy Japan would eventually use to fight the Pacific war. [ill, M, B, i]

Hughes, B. P. *Open Fire: Artillery Tactics from Marlborough to Wellington*. London: Bird, 1983. A focused study of artillery in the formative eighteenth century, including the dominance of smoothbore field artillery weapons and the tactics, organization, and operations that were developed along with them. [ill, M, B, i]

Hughes, Wayne P. *Fleet Tactics: Theory and Practice*. Annapolis, Md.: Naval Institute Press, 1986. A major contribution to naval literature; a comprehensive survey of naval tactics over five distinct periods, such as those of sailing ships, big gunships, and carriers. [ill, tab, app, B, i]

Inoguchi, Rikihei, and Nakajima Tadashi. *The Divine Wind: Japan's Kamikaze Force in World War II*. Annapolis, Md.: Naval Institute Press, 1958. The Japanese perspective and rationale for the unique kamikaze force used on an increasing scale during the war. [ill, i]

Jacobsen, Carl G., ed. *The Uncertain Course: New Weapons, Strategies and Mind-sets*. New York: Oxford University Press, 1987. An account of the changing nature in war in the last years of the Cold War. [B, i]

Joes, Anthony James. *Guerrilla Warfare: A Historical, Biographical, and Bibliographical Sourcebook*. Westport, Conn.: Greenwood Press, 1996. A series of case studies and 151 profiles of guerrilla leaders, including those of the American Revolution, Haiti, the Boer War, the Chinese Civil War, and the Vietnam War. [M, B, i]

Johnson, David E. *Fast Tanks and Heavy Bombers: Innovation in the U.S. Army, 1917-1945*. Ithaca, N.Y.: Cornell University Press, 1998. A critical analysis with extensive documentation of how and why the United States was unprepared for World War II. [B, i]

Jones, Archer. *Civil War Command and Strategy: The Process of Victory and Defeat*. New York: Free Press, 1995. A sophisticated analysis of strategy during the American Civil War, focusing on key decisions. [ill, M, B, i]

_____. *Elements of Military Strategy: An Historical Approach*. Westport, Conn.: Praeger, 1996. A conceptualization supported by extensive statistics, using history as a source of ideas; a series of case studies considering strategy, logistics, tactics, and operations. [ill, M, B, i]

Kane, Thomas M. *Ancient China on Postmodern War: Enduring Ideas from the Chinese Strategic Tradition*. New York: Routledge, 2007. Outlines the social context in which Chinese military philosophers, such as the vaunted Sunzi (Sun Tzu), wrote, noting that it, like the early 2000's, was a time of social, economic, and military change.

Using both Chinese military strategists and later European military thought, the book looks at how such classical military thought can benefit modern debates over military strategy. [B, i]

Kemp, Paul. *Convoy Protection: The Defence of Seaborne Trade*. London: Arms & Armour, 1993. A study of the development and strategy of convoy protection, as used, for example, by France during the early modern period, against German U-boats during World War I, and against American submarines in the Pacific during World War II. [ill, tab, B, i]

Kennedy, Paul M., ed. *Grand Strategies in War and Peace*. New Haven, Conn.: Yale University Press, 1991. Ten essays on national strategies by noted scholars such as Kennedy, on Britain; John Hattendorf, on the War of the Spanish Succession; Michael Howard, on World War I; Dennis Showalter, on Germany; and Douglas Porch, on France. [B, i]

Laqueur, Walter. *Guerrilla: A Historical and Critical Study*. Boston: Little, Brown, 1976. A general and historical survey of guerrilla warfare, covering partisans against Adolf Hitler, National Liberation movements, and fictional accounts by Honoré de Balzac, Leo Tolstoy, and Ernest Hemingway. [chr, B, i]

_____. *The New Terrorism: Fanaticism and the Arms of Mass Destruction*. New York: Oxford University Press, 1999. An important review and discussion on the history and psychology of terrorists, including animal rights activists, UFO (unidentified flying object) cultists, and religious extremists, linking them to literature and popular culture. [B, i]

_____, ed. *The Guerrilla Reader: A Historical Anthology*. New York: New American, 1977. Accounts from forty authors taken from the eighteenth century to the present. [B]

_____, ed. *The Terrorism Reader: A Historical Anthology*. Philadelphia: Temple University Press, 1978. A series of writings selected by the author. An examination, based on terrorism as it existed in the 1970's, of the origins of terrorism as a tactic and the military, social, and religious philosophies from which it flows. [B]

Leighton, Richard, and Robert W. Coakley. *Global Logistics and Strategy*. 2 vols. Washington, D.C.: Government Printing Office, 1955-1968. A study of the intricate and complicated logistical process worldwide and its impact on strategy. [ill, M, B, i]

Liddell Hart, Basil H. *The Strategy of Indirect Approach*. London: Faber and Faber, 1941. A survey, by one of the most influential strategic thinkers of the twentieth century, of the history and making of strategy; later editions include a chapter on unconventional warfare. [M]

Luttwak, Edward N. *The Political Uses of Sea Power*. Baltimore: Johns Hopkins University Press, 1974. A study of alternative operations related to diplomacy and international affairs, such as naval "presence," interposition, and blockade. [B]

_____. *Strategy and History*. New Brunswick, N.J.: Transaction Books, 1985. A volume containing essays by Luttwak covering the strategy of military deterrence, and the use of seapower, as well as other topics. [i]

McNeilly, Mark. *Sun Tzu and the Art of Modern Warfare*. New York: Oxford University Press, 2003. A treatise on the continued relevance of Sunzi (Sun Tzu), including references to terrorism. [B, i]

Mahan, Alfred Thayer. *The Influence of Sea Power upon the French Revolution and Empire, 1793-1812*. Boston: Little, Brown, 1892. The second and continuing treatise about the impact of sea power based on Mahan's understanding of the classic case study, the British success against France. [ill, M, B, i]

_____. *The Influence of Sea Power upon History, 1660-1783*. Boston: Little, 1890. An enormously influential treatise on the decisive influence of naval battle fleets on national development and expansion, based on Mahan's perceptions of British history during the early modern period; said to be read and heeded by political and naval officials of all the major powers during the 1890's and later, and considered the "bible of the Blue Water School" of naval expansionists. [ill, M, B, i]

_____. *Naval Strategy: Compared and Contrasted with the Principles and Practices of Military Operations on Land*. London: Sampson, 1911. A

later treatise of Mahan, demonstrating the differences between military and naval strategies. [ill, M, i]

Mao Zedong. *Six Essays on Military Affairs*. Beijing: Foreign Languages Press, 1971. Six essays, written between 1936 and 1948, that were influential in the thinking of the Chinese Communist army.

Mao Zedong and Che Guevara. *Guerilla Warfare*. London: Cassell & Company, 1962. An account of the nature of guerrilla warfare by two of its leading protagonists, involving comments not just on conflicts in which they were involved but on the philosophical underpinnings of their strategies as well. [i]

Martin, Laurence W. *The Sea in Modern Strategy*. New York: Praeger, 1967. A review and critique of notable naval strategists, such as Alfred Thayer Mahan, Julian S. Corbett, and Bernard Brodie, exclusive of important factors such as aircraft, submarines, and missiles. [ill, B]

Miller, Edward S. *War Plan Orange: The U.S. Strategy to Defeat Japan, 1897-1945*. Annapolis, Md.: Naval Institute Press, 1991. An extensively researched and award-winning study of the famous American war plan, first formulated about 1900, in case of war with Japan and further developed as opposing schools of thought, "thrusting" versus "cautionary," pressured for decisive influence. [ill, M, B, i]

Mitchell, William L. *Winged Defense: The Development and Possibilities of Modern Air Power, Economic and Military*. New York: G. P. Putnam's Sons, 1925. Reprint. Mineola, N.Y.: Dover, 1988. The classic advocacy of airpower by Billy Mitchell. [ill]

Murray, Williamson, MacGregor Knox, and Alvin Bernstein, eds. *The Making of Strategy: Rulers, States, and War*. New York: Cambridge University Press, 1994. A study similar to Paret's *Makers of Modern Strategy*, with more emphasis on the process and coverage of earlier times, including seventeen case studies on topics such as the Peloponnesian War, Rome versus Carthage, Ming Dynasty China, Philip II of Spain, Winston Churchill, and Israel. [ill, B, i]

Murray, Williamson, and Richard Hart Sinnreich, eds. *The Past as Prologue: The Importance of History to the Military Profession*. New York: Cambridge University Press, 2006. Although the study of history is clearly important to military strategists, the book analyzes the challenges of applying historical events and ideas to modern warfare. Military conflict has long provided fertile ground for historians, and there are problems that have recurred throughout military history for which having a good contextual knowledge is vital. [B, i]

Nasution, Abdul Haris. *Fundamentals of Guerilla Warfare, and the Indonesian Defence System, Past and Future*. Djakarta: Indonesian Army Information Service, 1953. A detailed history of the nature of successful guerrilla warfare during the Dutch-Indonesian War, and also how this can be used in other conflicts. [ill, M]

O'Neill, Richard. *Suicide Squads: Axis and Allied Special Attack Weapons of World War II, Their Development, and Their Missions*. New York: Salamander, 1981. A review of the use, mostly by the Japanese, of torpedoes, midget submarines, and aircraft. [ill, M, B, i]

Paret, Peter, ed. *Makers of Modern Strategy: From Machiavelli to the Nuclear Age*. Princeton, N.J.: Princeton University Press, 1986. Based on the 1943 classic edited by Edward Mead Earle, a superb guide to modern strategy; twenty-eight essays by eminent scholars, twenty-two of them new, including Felix Gilbert on Niccolò Machiavelli, R. R. Palmer on Frederick the Great, Paret on Carl von Clausewitz, Hajo Holborn on the Prussian-German school, and David McIsaac on airpower theory. [B, i]

Parker, Geoffrey. *The Grand Strategy of Philip II*. New Haven, Conn.: Yale University Press, 1998. An argument by a noted expert on the early modern European military that Philip II of Spain formulated a grand strategy based on imperialism and expansion, a view contrary to some prominent scholars, such as Fernand Braudel, Paul Kennedy, and Henry Kamen. [ill, B, i]

Perla, Peter P. *The Art of Wargaming*. Annapolis, Md.: Naval Institute Press, 1990. An analysis of

the techniques of war-gaming as essential to grand strategy. [ill, app, B, i]

Reynolds, Clark G. *Command of the Sea: The History and Strategy of Maritime Empires*. 2 vols. New York: William Morrow, 1974. A substantial historical synthesis by a prominent authority, characterized by depth and balance and an especially impressive bibliography. [M, B, i]

Robison, Samuel S., and Mary L. Robison. *A History of Naval Tactics from 1530 to 1930: The Evolution of Tactical Maxims*. Annapolis, Md.: Naval Institute Press, 1942. An old classic, a substantial survey focusing on technical aspects of naval warfare, from King Richard I's Third Crusade to the Armada and Jutland campaigns. [ill, M]

Roskill, Stephen W. *The Strategy of Sea Power: Its Development and Application*. London: Collins, 1962. Reprint. Westport, Conn.: Greenwood Press, 1981. A collection of the Lees-Knowles lectures given at Cambridge University, with extensive use of historical analysis as an apology for Julian S. Corbett, who had been ignored during World War I. [B]

Ross, Steven T. *American War Plans, 1919-1941*. 5 vols. New York: Garland, 1992. Almost two thousand pages describing in detail the making of a series of American war plans during the interwar period, the responsibility of the Joint Army-Navy Board; individual volumes cover peacetime war plans, plans for war against the British and Japanese, plans to meet the Axis threats, coalition plans, and plans for global war. [ill, M]

_____. *American War Plans, 1939-1945*. London: Cass, 1996. The story after the making of the various plans as described in the previous entry; a more complicated and challenging process, dealing with problems within the coalition, interservice rivalries, disagreements between field commanders and headquarters, and logistical restraints. [ill, M]

Ryan, Alan. *Thinking Across Time: Concurrent Historical Analysis on Military Operations*. Duntroon, Australia: Land Warfare Studies Centre, 2001. A short working paper on Australian military thinking.

Strachan, Hew, and Andreas Herberg-Rothe, eds. *Clausewitz in the Twenty-first Century*. New York: Oxford University Press, 2007. A series of articles showing the continued relevance of Clausewitz in the post-Cold War period. [B, i]

Van Creveld, Martin. *Command in War*. Cambridge, Mass.: Harvard University Press, 1985. A series of loosely connected essays about land warfare, presenting the historical evolution of the function of command, control, and communication in warfare, with an emphasis on the uncertainties. [ill, B, i]

Wegener, Wolfgang. *The Naval Strategy of the World War*. Translated by Holger Herwig. 1929. Reprint. Annapolis, Md.: Naval Institute Press, 1989. A classic treatise written in approximately 1915 by a German vice admiral highly critical of Alfred von Tirpitz's strategy and "risk fleet theory" and celebrated for his perceptiveness, his appreciation of the importance of geopolitics in naval strategy, and his "Atlantic vision," which Germany should possibly have followed in World War I. [B, i]

Weigley, Russell F. *The Age of Battles: The Quest for Decisive Warfare from Breitenfeld to Waterloo*. Bloomington: Indiana University Press, 1991. By a preeminent authority, a look at war from the initiation of conflict to the "the grand-scale battle," a feature of military and naval professionalism. [M, B, i]

_____. *The American Way of War: A History of U.S. Military Strategy and Policy*. New York: Macmillan, 1973. A study of American military institutions and a survey of American strategy, including coverage of George Washington and attrition, Robert E. Lee and Napoleonic strategy, Ulysses S. Grant and annihilation, Alfred Thayer Mahan and Stephen B. Luce and sea power and empire, Billy Mitchell and airpower, and Douglas MacArthur and the frustrations of limited war in Korea. [M, B, i]

Wilt, Alan F. *War from the Top: German and British Military Decision Making During World War II*. Bloomington: Indiana University Press, 1990. A masterful analysis of the only two powers that fought throughout World War II, using a comparative approach to conclude that the overall direction of the war was better handled by the British

and that, after 1940, all of Adolf Hitler's decisions were flawed. [M, B, i]

Wintringham, Thomas, and J. N. Blashford-Snell. *Weapons and Tactics*. London: Faber and Faber, 1943. Reprint. Baltimore: Penguin, 1973. A thought-provoking but dated analysis. [B, i]

WEAPONS AND TECHNOLOGIES

AIR WEAPONS

Batchelor, John, and Bryan Cooper. *Fighter: A History of Fighter Aircraft*. New York: Charles Scribner's Sons, 1974. A general survey. [ill, B]

Beaver, Paul. *Attack Helicopters*. London: Arms & Armour, 1987. A survey of attack helicopters, first used for armed battlefield reconnaissance during the Korean War and later used as "gunships." [ill]

Boyce, Joseph C., ed. *New Weapons for Air Warfare: Fire-Control Equipment, Proximity Fuzes, and Guided Missiles*. Boston: Little, Brown, 1947. A post-World War II assessment by the Office of Scientific Research and Development of past technological accomplishments and anticipated future successes. [ill]

Boyne, Walter J., ed. *Air Warfare: An International Encyclopedia*. Santa Barbara, Calif.: ABC-CLIO, 2002. A detailed encyclopedia by the former director of the National Air and Space Museum, covering entries alphabetically for aircraft, conflicts, biographies, themes such as air war in the arts, and also the role of women. Covers wars through the initial war in Afghanistan. [ill, M, B]

Buckley, John D. *Air Power in the Age of Total War*. London: University College, London, Press, 1999. An analysis of the changes in airpower after the end of the Cold War. [ill, B, i]

Burrows, William E. *By Any Means Necessary: America's Secret Air War in the Cold War*. New York: Farrar, Strauss and Giroux, 2001. A detailed account of the use of military and civilian airplanes during the Cold War. [B, i]

Constant, Edward W. *The Origins of the Turbojet Revolution*. Baltimore: Johns Hopkins University Press, 1980. A discussion of the impact of an important technological advance. [ill, B, i]

Cross, Wilbur. *Zeppelins of World War I: The Dramatic Story of Germany's Lethal Airships*. New York: Paragon, 1991. A collection of accounts of little-publicized aerial warfare, German zeppelins bombing British cities. [ill, B, i]

Everett-Heath, John. *Helicopters in Combat: The First Fifty Years*. London: Arms & Armour, 1992. A survey. Presents a detailed history of military helicopters from their first implementation as evacuation vehicles to the 2000's, through their evolution during the Korean War, the Vietnam War (when aerial gunships first saw action), to the modern era, where they are one of the most ubiquitous and deadly weapons available on the battlefield. [ill, app, B, i]

Godden, John, ed. *Harrier: Ski Jump to Victory*. Washington, D.C.: Brassey's, 1983. A case study of the success of the Harrier jump-jet during the Falkland Islands campaign. [ill, i]

Gooch, John, ed. *Airpower: Theory and Practice*. London: Cass, 1995. A series of essays about the development of airpower, including the contributions of Giulio Douhet, Billy Mitchell, and Hugh Trenchard and the debate between advocates of precision and area bombing. [ill, M, B, i]

Harris, Arthur T. *Bomber Offensive*. London: Collins, 1947. Reprint. London: Greenhill, 1990. Apologetics by the controversial commander of British strategic bombing. [M]

Hastings, Max. *Bomber Command: The Myths and Realities of the Strategic Bombing Offensive, 1939-1945*. New York: Dial, 1979. An examination of the controversial question about the effectiveness of the Strategic Bombing Offensive. [ill, B, i]

Hearn, Chester G. *Carriers in Combat: The Air War at Sea*. Westport, Conn.: Praeger Security International, 2005. Covers naval air power, aircraft carriers at war, air admirals, strategies, and tactics in several twentieth century conflicts. [ill, M, B, i]

Higham, Robin. *Air Power: A Concise History*. Rev. 3d ed. Manhattan, Kans.: Sunflower University Press, 1988. A historical survey. [ill, B, i]

Homze, Edward L. *Arming the Luftwaffe: The Reich*

Air Ministry and the German Aircraft Industry, 1919-1939. Lincoln: University of Nebraska Press, 1976. A case study of industry, logistics, politics, and air force officials involved in the making of a major airpower. [ill, B, i]

Hone, Thomas C., Norman Friedman, and Mark D. Mandeles. *American and British Aircraft Carrier Development, 1919-1941*. Annapolis, Md.: Naval Institute Press, 1999. A study of the extraordinary, fateful, and decisive innovations in the creation of British and American aircraft carriers. [ill, B, i]

Kennett, Lee B. *A History of Strategic Bombing*. New York: Charles Scribner's Sons, 1982. A survey of airpower, from the initial fear of bomber aircraft to industrial preparation for massive production and eventual "total war." [ill, B, i]

Kozak, Warren. *Lemay: The Life and Wars of General Curtis Lemay*. Washington, D.C.: Regnert, 2009. A detailed history of General Curtis LeMay and his belief in the superiority of airpower. [ill, B, i]

Marriott, Leo. *Royal Navy Aircraft Carriers, 1945-1990*. London: Ian Allan, 1985. A detailed history of the developments in aircraft carriers by the Royal Navy from the end of World War II. [ill, B, i]

Mason, R. A. *Air Power: An Overview of Roles*. London: Brassey's, 1987. A short account of the nature of airpower in the last years of the Cold War. [ill, B, i]

Meilinger, Phillip S. *Airwar: Theory and Practice*. Portland, Oreg.: Frank Cass, 2003. An analysis of the changes in aerial warfare from the end of the Cold War. [B, i]

_____, ed. *The Paths of Heaven: The Evolution of Airpower Theory*. Maxwell Air Force Base, Ala.: Air University Press, 1997. Essays by teachers and students reviewing the origins and evolution, covering theorists such as Giulio Douhet, Billy Mitchell, and Hugh Trenchard. [B, i]

Mikesh, Robert C. *Zero Fighter*. New York: Crown, 1980. An exquisite, double-folio publication production with foldout pages, covering the Mitsubishi Type 0 Japanese fighter, the Zero, a completely original aircraft design that achieved notable early success during World War II. [ill]

Murphy, James T. *Skip Bombing*. Westport, Conn.: Praeger, 1993. The story of the development of an effective low-altitude bombing tactic, used against Japanese supply and troop ships in the Pacific war, that increased "hits" from 1 to 72 percent. [ill, i]

Nordeen, Lon O. *Air Warfare in the Missile Age*. Washington, D.C.: Smithsonian Institution Press, 1985. A detailed academic account of the changes in air warfare during the last period of the Cold War. [B, i]

Rimal, Raymond L. *Zeppelin! A Battle for Air Supremacy in World War I*. London: Conway, 1984. A profusely illustrated, folio-sized volume telling the story of British and German developments in the use of the zeppelin during World War I and including photographs of bomb damage. [ill, M, B, i]

Robinson, Douglas H. *Giants of the Sky: A History of the Rigid Airship*. Seattle: University of Washington Press, 1973. A scholarly survey and overview covering about forty years of development of 161 rigid airships in four nations. [B, i]

Sherry, Michael S. *The Rise of American Air Power: The Creation of Armageddon*. New Haven, Conn.: Yale University Press, 1987. A winner of the Bancroft Prize, the story of the creation and development of the American strategic bombing campaign and a cultural study of attitudes toward bombing. [ill, B, i]

Smith, Peter C. *Dive-Bomber: An Illustrated History*. Annapolis, Md.: Naval Institute Press, 1982. A history of the development of the dive-bomber and its impact. [ill, B, i]

Winton, John. *Air Power at Sea: 1945 to Today*. London: Sidgwick & Jackson, 1987. An account of the nature of airpower during the Cold War. [ill, M, B, i]

AMPHIBIOUS WARFARE

Alexander, Joseph H. *Storm Landings: Epic Amphibious Battles in the Central Pacific*. Annapolis, Md.: Naval Institute Press, 1997. Covers amphibious operations during World War II. [ill, M, glo, B, i]

Bartlett, Merrill L., ed. *Assault from the Sea: Essays*

on the History of Amphibious Warfare. Annapolis, Md.: Naval Institute Press, 1983. Fifty articles describing amphibious campaigns, such as the Norman Conquest, the Mongols against Japan, Gallipoli, Dieppe, and the Falkland Islands. [ill, B, i]

Croizat, Victor J. *Across the Reef: The Amphibious Tracked Vehicle at War*. New York: Sterling, 1989. An account of an early amphibious vehicle. [ill, M, B, i]

Keyes, Lord. *Amphibious Warfare and Combined Operations*. New York: Cambridge University Press, 1943. The chapters of the book, covering military conflicts from the eighteenth century through the mid-twentieth century, consist of lectures delivered by Britain's first wartime director of combined operations during World War II, at the annual Lees Knowles Lectures at Trinity College, Cambridge University.

McGee, William L. *Amphibious Operations in the South Pacific in World War II*. 2 vols. Santa Barbara, Calif.: BMC, 2000-2002. A detailed history of the U.S. Marine Corps, especially the operations on the Solomons and Bougainville. [ill, M, B, i]

Polmar, Norman, and Peter B. Mersky. *Amphibious Warfare: The Illustrated History*. London: Blandford, 1988. A profusely illustrated, folio-sized volume beginning with early combined operations, moving toward the massive invasions of World War II, and culminating in more recent amphibious operations, such as Suez, Vietnam, and the Falkland Islands. [ill, M, B, i]

ARMY WEAPONS

Croll, Mike. *The History of Landmines*. London: Cooper, 1998. A short, disjointed survey about the use of land mines, consciousness-raising about their implications, and international efforts to limit their use. [ill, B, i]

Dastrup, Boyd L. *The Field Artillery: History and Sourcebook*. Westport, Conn.: Greenwood Press, 1994. The history, use, and users of field artillery from 1350 to the present. [glos, app, B, i]

Duffy, Christopher. *Siege Warfare: The Fortress in the Early Modern World, 1494-1660*. New York: Routledge, 1979. A comprehensive study of siege warfare by country, including Italy, France, England, the Baltic states, China, and Japan. [ill, M, B, i]

Griffith, Paddy. *British Fighting Methods in the Great War*. London: Cass, 1996. An effort to evaluate and rehabilitate opinion of British military tactical leaders and their methods, which, the author insists, deserve more credit than they have been given. [tab, B, i]

Gudmundsson, Bruce I. *On Artillery*. Westport, Conn.: Praeger, 1993. A short academic account of the use of artillery. [B, i]

Hazlett, James C., et al. *Field Artillery Weapons of the Civil War*. Newark, N.J.: University of Delaware Press, 1983. An excellent reference work, with a detailed analysis of developments in artillery. [ill, tab, app, B, i]

Hogg, O. F. G. *Artillery: Its Origin, Heyday, and Decline*. Hamden, Conn.: Archon, 1970. A history of artillery. [ill, B]

Hughes, B. P. *Firepower: Weapons Effectiveness on the Battlefield, 1630-1850*. New York: Charles Scribner's Sons, 1974. A profusely illustrated, folio-sized assessment of the performance of combined infantry, cavalry, and artillery during the formative seventeenth through nineteenth centuries. [ill, B, i]

Macksey, Kenneth. *Tank Warfare: A History of Tanks in Battle*. New York: Stein, 1971. A history of development with an emphasis on tactics by a veteran armor officer. [ill, chr, B, i]

McLean, Donald B., ed. *Japanese Tanks, Tactics, and Antitank Weapons*. Wickenburg, Ariz.: Normount Technical, 1973. The story of tank developments and the use of the tank in the Japanese army. [ill]

Marsden, Eric W. *Greek and Roman Artillery: Technical Treatises*. Oxford: Clarendon Press, 1971. A detailed history of artillery used by and against the Greeks and Romans. [ill, B, i]

Messenger, Charles. *The Art of Blitzkrieg*. New York: Simon & Schuster, 1976. The story of developments in tank warfare, especially during the interwar period. [ill, B, i]

Needham, Joseph. *Military Technology: The Gun-*

powder Epic. New York: Cambridge University Press, 1987. The story of the increasing dominance of gunpowder in warfare during the early modern period. [ill, B, i]

Perrett, Bryan. *A History of Blitzkrieg*. New York: Stein, 1983. A popular history describing Germany's use of the Blitzkrieg from Poland to Kursk, as well as the Blitzkrieg's use by Americans, Japanese, and Israelis. [ill, B, i]

Roland, Paul M. *Imperial Japanese Tanks, 1918-1945*. New York: Bellona, 1975. A survey of tank developments by the Japanese before and during World War II. [ill]

Showalter, Dennis E. *Railroads and Rifles: Soldiers, Technology, and the Unification of Germany*. Hamden, Conn.: Archon, 1975. A critical and scholarly analysis by an eminent authority of the military impact of advanced technological developments on politics and international events. [M, B, i]

Strachan, Hew. *European Armies and the Conduct of War*. London: Routledge & Kegan Paul, 1983. An outstanding example of the relation of strategic theory to actual practice. [ill, M, B, i]

Van Creveld, Martin. *Fighting Power: German and U.S. Army Performance, 1939-1945*. Westport, Conn.: Greenwood Press, 1982. A comparative analysis of German and American fighting power. [tab, app, B, i]

Vuksic, V., and Z. Grbasic. *Cavalry: The History of a Fighting Elite, 650 B.C.-A.D. 1914*. New York: Sterling, 1993. A profusely illustrated, folio-sized volume including one hundred color plates and a short narrative essay. [ill, i]

Watson, Bruce A. *Sieges: A Comparative Study*. Westport, Conn.: Praeger, 1993. An analysis of five case studies, including Jerusalem in 1099 and Singapore in 1942. [ill, M, B, i]

Wright, Patrick. *Tank: The Progress of a Monstrous War Machine*. London: Faber, 2000. An anecdotal history of the tank, from its beginnings in 1914, when the crisis in trench warfare prompted British analysts to look toward engines and tracked vehicles to break the deadlock, to its evolution for use in Blitzkrieg warfare. [ill]

CHEMICAL AND BIOLOGICAL WARFARE

Adams, Valerie. *Chemical Warfare, Chemical Disarmament: Beyond Gethsemane*. New York: Macmillan, 1989. An analysis of the nature of chemical warfare at the end of the Cold War. [B, i]

Barnaby, Wendy. *The Plague Makers: The Secret World of Biological Warfare*. New York: Continuum, 2002. A detailed account of the possibility of biological warfare, including its potential use by terrorists. [B, i]

Gander, Terry. *Nuclear, Biological, and Chemical Warfare*. London: Ian Allan, 1987. A survey of different forms of warfare during the Cold War. [ill, B, i]

Hammond, James W. *Poison Gas: The Myths and Reality*. Westport, Conn.: Greenwood Press, 1999. Definitions, history, various scientific factors, and "myths" are reviewed. [B, i]

Hoenig, Steven L. *Handbook of Chemical Warfare and Terrorism*. Westport, Conn.: Greenwood Press, 2002. A reference book giving a detailed survey on the nature of chemical warfare and also its possible use by terrorists. [B, i]

Mauroni, Albert J. *America's Struggle with Chemical-Biological Warfare*. Westport, Conn.: Greenwood Press, 2000. A detailed review of the problems, challenges, and technicalities of chemical and biological warfare. [ill, tab, glo, B, i]

Solomon, Brian, ed. *Chemical and Biological Warfare*. New York: H. W. Wilson, 1999. A post-Cold War survey of chemical and biological weaponry and scenarios for their possible deployment. [B, i]

Spiers, Edward M. *Chemical and Biological Weapons: A Study of Proliferation*. New York: St. Martin's Press, 1994. A survey of the problems of proliferation, using the Middle East as a focus. [tab, app, B, i]

_____. *Chemical Warfare*. Urbana: University of Illinois Press, 1986. A brilliant analysis presenting the origins and nature of chemical warfare. [app, B, i]

_____. *Weapons of Mass Destruction*. New York: St. Martin's Press, 2000. An overview and analysis, incorporating revelations of 1990's terrorism proliferation and counterproliferation.

ELECTRONICS

Brown, Louis. *A Radar History of World War II: Technical and Military Imperatives*. Bristol: Institute of Physics, 1999. A detailed history of the radar. [ill, B, i]

Buderi, Robert. *The Invention That Changed the World: How a Small Group of Radar Pioneers Won the Second World War and Launched a Technological Revolution*. New York: Simon & Schuster, 1998. The story of the making of radar. [ill, glo, B, i]

De Archangelis, Mario. *Electronic Warfare: From the Battle of Tsushima to the Falklands and the Lebanon Conflicts*. New York: Sterling, 1985. A survey of the development and use of electronic warfare. [ill, M, B, i]

Fisher, David E. *A Race on the Edge of Time: Radar, the Decisive Weapon of World War II*. New York: Paragon, 1989. A slightly exaggerated, but timely and insightful, account of radar use in World War II. [ill, tab, app, i]

Hackmann, Willem D. *Seek and Strike: Sonar, Anti-submarine Warfare, and the Royal Navy, 1914-54*. London: H.M.S.O., 1984. The story of the development of sonar technology, the science of acoustics, and associated tactics. [ill, app, B, i]

Kiely, D. G. *Naval Electronic Warfare*. Washington, D.C.: Brassey's, 1987. A general survey, including coverage of radar and HF/DF, the radio direction-finding technology that was a key process in defeating German U-boats during World War II. [ill, i]

Latham, Colin, and Anne Stobbs. *Radar: A Wartime Miracle*. Dover, N.H.: Sutton, 1996. A historical survey of radar's use and performance during World War II. [ill, glo, app, B, i]

Macksey, Kenneth. *Technology in War: The Impact of Science on Weapon Development and Modern Battle*. New York: Prentice Hall Press, 1986. An important work on the nature of changing technology toward the end of the Cold War. [ill, B, i]

Mendelsohn, Everett, Merritt Roe Smith, and Peter Weingart, eds. *Science, Technology, and the Military*. 2 vols. Boston: Kluwer Academic, 1988. A very detailed academic account of the nature of science technology and its effects on military thinking at the end of the Cold War. [ill, B. i]

Page, Robert M. *The Origins of Radar*. 1962. Reprint. Westport, Conn.: Greenwood Press, 1979. The story of the development of radar (an acronym for radio detection and ranging), first used in 1934 by an electronic engineer. [ill, i]

Schleher, D. Curtis. *Introduction to Electronic Warfare*. Dedham, Mass.: Artech House, 1986. A historic account of the nature of electronic warfare during the latter period of the Cold War. [ill, B, i]

Williams, Kathleen B. *Secret Weapons: U.S. High-Frequency Direction-Finding in the Battle of the Atlantic*. Annapolis, Md.: Naval Institute Press, 1996. Details of the sophisticated and elaborate system of electronic warfare whereby the origin of the transmission of radio waves is pinpointed by antennas in various locations, a highly effective process that located German U-boats. [ill, M, B, i]

FIREARMS

Allsop, D. F., and M. A. Toomey. *Small Arms*. Washington, D.C.: Brassey's, 1999. A useful survey. [ill]

Ayalon, David. *Gunpowder and Firearms in the Mamlūk Kingdom: A Challenge to a Medieval Society*. London: Cass, 1978. A study of the early use of firearms in Egypt. [B, i]

Bailey, J. B. *Field Artillery and Firepower*. New York: Military Press, 1987. A survey of more than 650 years of development in the area of field artillery, looking both at the technical aspects of different weapons systems and at the ways in which they have changed the tactics and strategy of warfare. [ill, B, i]

Bradley, Iain. *Firearms*. Edinburgh: W. Green & Sweet and Maxwell, 1995. An overview of firearms laws and regulations. [il, i]

Chase, Kenneth Warren. *Firearms: A Global History to 1700*. New York: Cambridge University Press, 2003. A general history of firearms. [ill, B, i]

Ford, Roger. *The Grim Reaper: Machine Guns and Machine Gunners in Action*. New York: Sarpedon, 1997. A history of the invention, development, and use of the machine gun. [ill, B, i]

Hobart, F. W. A. *Pictorial History of the Machine Gun*. London: Ian Allan, 1971. A detailed illus-

trated history of the development of the machine gun. [ill, i]

Kelly, Jack. *Gunpowder: A History of the Explosive That Changed the World*. London: Atlantic Books, 2004. A history of the development of gunpowder. [ill, B, i]

Pope, Dudley. *Guns: From the Invention of Gunpowder to the Twentieth Century*. New York: Delacorte, 1965. A general survey of military and naval ordnance. [ill]

INTELLIGENCE TECHNOLOGY

Alvarez, David J. *Secret Messages: Codebreaking and American Diplomacy, 1930-1945*. Lawrence: University Press of Kansas, 2000. A detailed account of the use of code breaking by the United States in the run-up to the Pacific war and during World War II. [ill, B, i]

Andrew, Christopher M., ed. *Codebreaking and Signals Intelligence*. London: Cass, 1986. A series of essays by experts on signals intelligence (SIGINT), the most important method of intelligence collection in the twentieth century, including coverage of interception, code breaking, and cryptanalysis. [B]

Budiansky, Stephen. *Battle of Wits: The Complete Story of Codebreaking in World War II*. New York: Free Press, 2000. A detailed history of the nature of code breaking in World War II, making use of many sources that did not become available until after the end of the Cold War. [ill, M, B, i]

Copeland, B. Jack, et al., ed. *Colossus: The Secrets of Bletchley Park's Codebreaking Computers*. New York: Oxford University Press, 2006. A history of Bletchley Park making copious use of British government records that became available only at the end of the twentieth century. [ill, B, i]

Hartcup, Guy. *Camouflage: A History of Concealment and Deception in War*. New York: Charles Scribner's Sons, 1980. A study of camouflage as used in air, land, and naval contexts, with a series of national examples. [ill, B, i]

Hesketh, Roger. *Fortitude: The D-Day Deception Campaign*. London: St. Ermin, 1999. A previously classified report, revealing details about the successful deception campaign for the Normandy invasion in which the focus was on Calais. [ill, app, glo, M, B, i]

Hinsley, F. H. *British Intelligence in the Second World War*. London: H.M.S.O., 1983. An abridged edition of the original five volumes of official history published in the late 1970's, which revealed for the first time the unprecedented and massive intelligence operation based at Bletchley Park, seventy miles northwest of London, where ten thousand expert Allied operatives broke German, Italian, and Japanese codes and quickly informed pertinent commanders. [M, B, i]

Hinsley, F. H., and Alan Stripp, eds. *Code Breakers: The Inside Story of Bletchley Park*. New York: Oxford University Press, 1993. A personalized and informative presentation of accounts by participants in the massive intelligence operation conducted during World War II. [ill, i]

Kahn, David. *The Codebreakers: The Story of Secret Writing*. New York: Scribner, 1996. A detailed history of codes and code breaking from ancient times through to the Cold War, by one of the acknowledge experts in the field. [ill, B, i]

Neilson, Keith, and B. J. C. McKercher. *Go Spy the Land: Military Intelligence in History*. Westport, Conn.: Praeger, 1992. A survey of the history of military intelligence. [B, i]

Stripp, Alan. *Codebreaker in the Far East*. London: Frank Cass, 1989. An account of code breaking in East Asia and the Pacific war, including a detailed account of how the Japanese devised their own codes. [ill, B, i]

Welchman, Gordon. *The Hut Six Story: Breaking the Enigma Code*. New York: McGraw-Hill, 1982. The extraordinary story by a major participant of Bletchley Park and the breaking of the German codes, describing the Bletchley Park environment and the process of decryption in an understandable manner. [ill, app, B, i]

NAVAL WEAPONS

Baxter, James P. *The Introduction of the Ironclad Warship*. Cambridge, Mass.: Harvard University Press, 1933. Reprint. Annapolis, Md.: Naval Institute Press, 2001. The best account of the nineteenth century transition to ironclad warships, de-

scribing five innovations: steam power, shell guns, the screw propeller, rifled guns, and armor. [ill, B]

Boudriot, Jean. *The Seventy-four Gun Ship: A Practical Treatise on the Art of Naval Architecture*. Translated by David Roberts. 4 vols. Annapolis, Md.: Naval Institute Press, 1986-1988. An exquisitely comprehensive description of the standard ship of the line, with volumes on hull construction, fittings, rigging, and manning and ship handling. [ill]

Breyer, Siegfried. *Battleships and Battle Cruisers, 1905-1970*. Translated by Alfred Kurti. New York: Doubleday, 1970, 1973. A short history of the battleship, followed by descriptions and more than nine hundred illustrations of every battleship of every country during the period from 1905 to 1970. [ill, tab, B]

Brogger, A. W., and Haakon Shetelig. *The Viking Ships: Their Ancestry and Evolution*. Translated by Katherine John. Oslo: Dreyersforlag, 1951. An account not just of Viking longboats but also the orgin of their design and how they were later adapted in medieval Europe. [ill, M, i]

Busk, Hans. *The Navies of the World*. London: Routledge, Warnes and Routledge, 1859. Facsimile. Annapolis, Md.: Naval Institute Press, 1973. When originally published, this book provided a survey of the navies around the world just before the start of the American Civil War. Republished, this is an important contemporary source about naval power during the mid-nineteenth century. [ill, M]

Campbell, N. J. M. *Jutland: An Analysis of the Fighting*. Annapolis, Md.: Naval Institute Press, 1986. An extraordinarily detailed study and analysis of the performance of all guns of all calibers on both the British and German sides, with statistics on ammunition expended, the disposition of each round, the damage sustained, and the resulting damage-control measures. [ill, tab, B, i]

_____. *Naval Weapons of World War II*. Annapolis, Md.: Naval Institute Press, 1985. An extensive, folio-sized, country-by-country survey of all naval weapons, with 750 illustrations. [ill, tab, i]

Cipolla, Carlo M. *Guns, Sails, and Empires: Technological Innovation and the Early Phases of European Expansion, 1400-1700*. London: Collins, 1965. Reprint. New York: Barnes & Noble Books, 1996. A substantial survey of the crucial, much-debated question of whether naval armaments and related technological advances made European expansion and hegemony inevitable during the early modern period. [ill, B]

Clancy, Tom. *Submarine: A Guided Tour Inside a Nuclear Warship*. New York: G. P. Putnam's Sons, 1993. An extraordinarily detailed report on an official tour of a nuclear submarine. [ill]

Friedman, Norman. *U.S. Naval Weapons: Every Gun, Missile, Mine, and Torpedo Used by the U.S. Navy from 1883 to the Present Day*. Annapolis, Md.: Naval Institute Press, 1982. A comprehensive review of naval weaponry. [ill, B, i]

Gardiner, Robert, ed. *Cogs, Caravels, and Galleons, 1000-1650*. Annapolis, Md.: Naval Institute Press, 1994. A large-folio-format survey of warships during the transition from medieval to modern times, from the Vikings to the Dutch. [ill, glo, B, i]

Garzke, William H., Jr., and Robert O. Dulin, Jr. *Battleships: Axis and Neutral Battleships in World War II*. Annapolis, Md.: Naval Institute Press, 1985. An account of battleships operated by the Axis Powers as well as neutral countries in the early 1940's. [ill, M, B, i]

Gray, Edwyn. *The Devil's Device: Robert Whitehead and the History of the Torpedo*. Rev. ed. Annapolis, Md.: Naval Institute Press, 1991. The story of how an English engineer working in Austria invented and developed the torpedo. [ill, B, i]

Griffiths, Maurice. *The Hidden Menace: Mine Warfare, Past, Present, and Future*. London: Conway, 1981. A review of the numerous types of naval mines in language understandable by the layperson. [ill, i]

Hobson, Rolf, and Tom Kristiansen. *Navies in Northern Waters 1721-2000*. Portland, Oreg.: Frank Cass, 2004. An account of navies in northern Europe, with heavy emphasis on the Baltic. [B, i]

Howarth, Stephen. *The Fighting Ships of the Rising Sun: The Drama of the Imperial Japanese Navy, 1895-1945*. New York: Atheneum, 1983. The story of the Imperial Japanese Navy, a massive and innovative naval force that achieved spectacular

victories and equally devastating defeats, from its origin in 1894 until its demise in 1945. [ill, B, i]

Kaufmann, Robert Y., et al. *Submarine*. Annapolis, Md.: Naval Institute Press, 1993. A profusely illustrated, folio-sized volume supporting a televised documentary about submarines during and after World War II. [ill, B]

Lane, Frederic C. *Venetian Ships and Shipbuilders of the Renaissance*. 1934. Reprint. Baltimore: Johns Hopkins University Press, 1992. The history of one of the earliest and most important naval powers and its associated features, such as galleys, shipwrights, craft guilds, the construction process, timber supplies, and the famous Venice Arsenal. [ill, B, i]

Lavery, Brian, ed. *The Line of Battle: The Sailing Warship, 1650-1840*. London: Conway, 1992. Part of an important series, The History of the Ship, this volume includes essays on types of ships and fittings. [ill, B, i]

Lawliss, Chuck. *The Submarine Book: A Portrait of Nuclear Submarines and the Men Who Sailed Them*. New York: Thames, 1991. A short history of submarines and more details on modern nuclear-powered submarines. [ill]

Macintyre, Donald G. F. W. *Aircraft Carrier: The Majestic Weapon*. New York: Ballantine, 1968. A popular account of the development of the aircraft carrier, seen especially as the decisive factor in the Pacific campaign of World War II. [ill, B]

_____. *Wings of Neptune: The Story of Naval Aviation*. New York: Norton, 1964. A historical survey. [ill, B, i]

Macintyre, Donald G. F. W., and Basil W. Bathe. *The Man-of-War: A History of the Combat Vessel*. London: Methuen, 1969. A profusely illustrated, folio-sized historical survey. [ill, B, i]

Manson, Janet M. *Diplomatic Ramifications of Unrestricted Submarine Warfare, 1939-1941*. Westport, Conn.: Greenwood Press, 1990. A survey of international law and its implications, including case studies of U-boats during World War I, World War II, and American submarines in the Pacific, which all resorted to the same rationale. [M, B, i]

Massie, Robert K. *Dreadnought: Britain, Germany, and the Coming of the Great War*. New York: Random House, 1991. A history of the political impetus by the European navies to build the dreadnoughts in an arms race before the outbreak of World War I. [ill, M, B, i]

Neilson, Keith, and Elizabeth Jane Errington, eds. *Navies and Global Defense: Theories and Strategy*. Westport, Conn.: Praeger, 1995. Papers from a symposium held at the Royal Military College of Canada in 1994. [B, i]

O'Connell, Robert L. *Sacred Vessels: The Cult of the Battleship and the Rise of the U.S. Navy*. New York: Oxford University Press, 1991. A virtual indictment, critical of the U.S. Navy's excessive emphasis and reliance on the battleship, which, the author contends, was never an effective weapon. [ill, tab, B, i]

Padfield, Peter. *Guns at Sea*. New York: St. Martin's Press, 1973. A profusely illustrated, folio-sized historical survey from the time of projecting stones to the present, with an emphasis on the technical and tactical aspects of guns at sea. [ill, B]

Pivka, Otto von. *Navies of the Napoleonic Era*. New York: Hippocrene, 1980. A general overview that fills a void in a neglected area with accounts of spectacular Napoleonic battles, such as those of St. Vincent, Camperdown, Nile, Copenhagen, and Trafalgar. [ill, app, M, B]

Polmar, Norman, et al. *Aircraft Carriers: A Graphic History of Carrier Aviation and Its Influence on World Events*. New York: Doubleday, 1969. A full, detailed, scholarly, and engaging presentation. [ill, app, B, i]

Reynolds, Clark G. *The Fast Carriers: The Forging of an Air Navy*. New York: McGraw-Hill, 1968. Reprint. Annapolis, Md.: Naval Institute Press, 1992. A contribution to a controversial debate, arguing that fast carriers were the most significant naval development of World War II and especially decisive in the Pacific war. [ill, M, B, i]

Robertson, Frederic L. *The Evolution of Naval Armament*. London: Constable, 1921. Reprint. London: Storey, 1968. A classic, comprehensive survey featuring progressive developments in gunnery, gun carriages, propelling machinery, and armor. [ill, B, i]

Rodgers, William L. *Naval Warfare Under Oars: Fourth to Sixteenth Centuries: A Study of Strategy, Tactics, and Ship Design*. Annapolis, Md.: Naval Institute Press, 1939. Reprint. Norwalk, Conn.: Easton Press, 1991. A narrative history of events related to the use of galleys in the Mediterranean, by the Vikings, and during naval wars of England, France, and Italy. [ill, M, B]

Sondhaus, Lawrence. *Navies of Europe: 1815-2002*. Harlow: Longman, 2002. An overview of the changes in the nature of navies from the end of the Napoleonic Wars through to the end of the twentieth century. [ill, M, B, i]

Unger, Richard W., ed. *Cogs, Caravels, and Galleons: The Sailing Ship, 1000-1650*. London: Conway, 1994. A profusely illustrated, folio-sized volume focused on the technological advances of the sailing ship and its navigation. [ill, glo, B, i]

Whitley, M. J. *Battleships of World War II: An International Encyclopedia*. London: Arms & Armour Press, 1988. A detailed encyclopedia covering battleships by all countries during World War II. [ill, M, glo, B, i]

NONLETHAL WEAPONS

Alexander, John B. *Future War: Nonlethal Weapons in Modern Warfare*. New York: St. Martin's Press, 1999. An argument that innovative electromagnetic, acoustical, and psychological weapons are called for in the post-Cold War era of peacekeeping, humanitarian, and antiterrorist military missions. [ill, B, i]

Morehouse, David A. *Nonlethal Weapons: War Without Death*. Westport, Conn.: Praeger, 1996. The story of the development of nonlethal weapons in the twentieth century, associated with the search for alternative methods of combat. [ill, tab, B, i]

Rappert, Brian. *Non-lethal Weapons as Legitimizing Forces? Technology, Politics, and the Management of Conflict*. Portland, Oreg.: Frank Cass, 2003. Addresses state-of-the-art nonlethal weapons such as acoustic weapons, electromagnetic pulse beams, and calmative chemical agents. [ill, B, i]

NUCLEAR WEAPONS

Bernstein, Barton J., ed. *The Atom Bomb: The Critical Issues*. Boston: Little, Brown, 1976. A comprehensive assessment, featuring arguments both for and against the development and use of the atomic bomb. [B]

Caldicott, Helen. *The New Nuclear Danger: George W. Bush Military-Industrial Complex*. New York: New Press, 2004. An account of the increased importance of the military-industrial complex by one of the leading Australian antinuclear campaigners. [ill, B, i]

Cimbala, Stephen J. *Nuclear Weapons and Strategy: U.S. Nuclear Policy for the Twenty-first Century*. New York: Routledge, 2005. An important survey of the nature of nuclear weapons. [B, i]

Gerson, Joseph. *Empire and the Bomb: How the U.S. Uses Nuclear Weapons to Dominate the World*. Ann Arbor, Mich.: Pluto Press, 2007. A detailed account of the use and the threat of use of nuclear weapons, especially in Asia, including scenarios in China, during the Korean War, during the Vietnam War, and in the Middle East. [B, i]

Gray, Colin S. *The Second Nuclear Age*. Boulder, Colo.: Rienner, 1999. A discussion of the role of nuclear weapons in the post-Cold War era, concluding that nuclear arms control is not working and that China is a future potential antagonist. [B, i]

Groueff, Stephane. *Manhattan Project: The Untold Story of the Making of the Atomic Bomb*. Boston: Little, Brown, 1967. A report by a French journalist about the extraordinary and massive endeavor, with much interesting information from interviews of participants. [ill, B]

Groves, Leslie R. *Now It Can Be Told: The Story of the Manhattan Project*. New York: Harper, 1962. A firsthand account by the project's nonscientist director, an American general. [ill, i]

Harris, John B., and Eric Markusen, eds. *Nuclear Weapons and the Threat of Nuclear War*. New York: Harcourt, 1986. A presentation based on Cold War situations. [B]

Herf, Jeffrey. *War by Other Means: Soviet Power, West German Resistance, and the Battle of the Euromissiles*. New York: Free Press, 1991. A de-

tailed account, from a political viewpoint, of the introduction of nuclear missiles into Western Europe during the 1980's. [B, i]

Hilsman, Roger. *From Nuclear Military Strategy to a World Without War: A History and a Proposal*. Westport, Conn.: Praeger, 1999. An account of U.S. nuclear strategy by an adviser to President John F. Kennedy. [B, i]

Irving, David J. C. *The German Atomic Bomb: The History of Nuclear Research in Nazi Germany*. New York: Simon & Schuster, 1967. By a controversial author, the definitive history of the attempt by Germany to develop the atomic bomb; based on extensive primary research. [ill, M, B]

Kahn, Herman. *On Thermonuclear War*. Princeton, N.J.: Princeton University Press, 1960. Three lectures on the nature and feasibility, plans and objectives, and analysis of thermonuclear war. [ill, tab, i]

Maddox, Robert James. *Weapons for Victory: The Hiroshima Decision Fifty Years Later*. Columbia: University of Missouri Press, 1995. An assessment of the controversial decision to drop the atomic bomb at the end of World War II. [B, i]

Paul, T. V., and James J. Wirtz, eds. *The Absolute Weapon Revisited: Nuclear Arms and Emerging International Order*. Ann Arbor: University of Michigan Press, 1998. An essential and timely study, reevaluating nuclear weapons policies in the post-Cold War environment and analyzing their problems and potential. [i]

Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. Berkeley: University of California Press, 1999. A report on a particularly crucial issue: India and the proliferation of nuclear weapons in one of the most dangerous hot spots in the world. [M, B, i]

Quester, George H. *Nuclear First Strike: Consequences of a Broken Taboo*. Baltimore: Johns Hopkins University Press, 2006. An account of the problems with nuclear escalation and likely scenarios in which the United States could resort to nuclear warfare. [B, i]

Rhodes, Richard. *Dark Sun: The Making of the Hydrogen Bomb*. New York: Simon & Schuster, 1995. A clear and understandable narrative about the hydrogen bomb, with expert analysis and informative detail. [ill, glos, B, i]

_____. *The Making of the Atomic Bomb*. New York: Simon & Schuster, 1986. Awarded the Pulitzer Prize and the National Book Award, a comprehensive account focusing on developments in nuclear physics and the scientific aspects and technical complexities of the atomic bomb. [ill, B, i]

Wainstock, Dennis. *The Decision to Drop the Atomic Bomb*. Westport, Conn.: Praeger, 1996. A history of the thinking that went behind the decision by President Harry S. Truman to bomb Hiroshima and Nagasaki, written on the fortieth anniversary of the bombing. [B, i]

Walker, J. Samuel. *Prompt and Utter Destruction: Truman and the Use of Atomic Bombs Against Japan*. Chapel Hill: University of North Carolina Press, 2004. Analyzes President Harry S. Truman's decision to use atomic weapons against Japan in 1945, looking not only at what was and was not known by Truman himself but also at Japanese attitudes toward surrender. Provides the context in which the decision was made to use atomic weapons and examines an array of factors that eventually convinced Japan to end the war. [B, i]

PRIMITIVE AND ANCIENT WEAPONS

Annis, P. G. W. *Naval Swords: British and American Naval Edged Weapons, 1600-1815*. Harrisburg, Pa.: Stackpole, 1970. A general survey. [B, i]

Bartlett, Clive. *English Longbowman, 1530-1515*. London: Osprey, 1997. Explains how the success of the English military during the Late Middle Ages was built on the effective use of the longbow. A characteristically English weapon, it was not overcome in its ability to pierce armor or in its rate of fire until the early twentieth century. [ill, B]

Bishop, M. C., and J. C. N. Coulston. *Roman Military Equipment: From the Punic Wars to the Fall of Rome*. London: Batsford, 1993. An important history showing the changes in Roman military hardware. [ill, M, B, i]

Bradbury, Jim. *The Medieval Archer*. New York: St. Martin's Press, 1985. An important and useful, if somewhat dated, survey. [ill, B, i]

De Souza, Philip. *The Ancient World at War*. London: Thames & Hudson, 2008. This study includes chapters on warfare in various regions around the world. [ill, M, B, i]

Drews, Robert. *The End of the Bronze Age: Changes in Warfare and the Catastrophe ca. 1200 B.C.* Princeton, N.J.: Princeton University Press, 1993. Gives a military explanation for the fall of the Levantine, Hittite, Mycenaean, and Trojan kingdoms and the "dark age" that followed the end of the Bronze Age in the early twelfth century B.C.E. [ill, M, B, i]

Featherstone, Donald. *Bowmen of England*. London: Jarrolds, 1967. An account of how English archers were to change the nature of warfare in western Europe in the fourteenth and fifteenth centuries, by one of the leading British authors on war gaming.

Hamblin, William J., ed. *Warfare in the Ancient Near East c.1600 B.C.* New York: Routledge, 2005. A detailed account of the nature of fighting in the Eastern Mediterranean and Mesopotamia. [ill, M, B, i]

Kern, Paul Bentley. *Ancient Siege Warfare*. Bloomington: Indiana University Press, 1999. This book covers various different parts of the ancient world and is based on the premise that siege warfare was responsible for unleashing violence throughout the ancient world. [ill, M, glo, B, i]

Malone, Patrick M. *The Skulking Way of War: Technology and Tactics Among the Indians of New England*. Lanham, Md.: Madison Books, 1991. A survey of the ways of war among North American indigenous peoples. [ill, M, B, i]

Osgood, Richard. *Warfare in the Late Bronze Age of North Europe*. Oxford: Archaeopress, 1998. An account of the nature of warfare among the Germanic tribes from Roman sources. Makes heavy use of archaeological evidence. [ill, M, B, i]

Osgood, Richard, and Sarah Monks, with Judith Toms. *Bronze Age Warfare*. Stroud, Gloucestershire, England: Sutton, 2000. Using contemporary written sources, mainly Roman, this history makes extensive use of the latest archaeological finds. [ill, M, B, i]

Sidebottom, Harry. *Ancient Warfare*. New York: Oxford University Press, 2004. An account of warfare in the ancient world, including descriptions on ancient military philosophy. [M, glo, B, i]

Snodgrass, Anthony. *Early Greek Armour and Weapons: From the End of the Bronze Age to 600 B.C.* Edinburgh, Scotland: Edinburgh University Press, 1964. With profuse illustrations and literary sources such as Homer, a collection of descriptions of helmets, shields, armor, swords, spears, bows and arrows, and chariots. [ill, B, i]

Underwood, Richard. *Anglo-Saxon Weapons and Warfare*. Stroud, Gloucestershire, England: Tempus, 1999. A study based on an extensive and informative survey from the artifacts, such as helmets, shields, mail coats, swords, spears, and knives, recovered from the famous Sutton Hoo ship burial in East Anglia. [ill, B, i]

Eugene L. Rasor, revised by Justin Corfield

Web Sites

The AK Site
http://kalashnikov.guns.ru/
Affiliated with: Military Parade magazine
Contains detailed specifications and history of the development of the Kalashnikov rifle, in all of its variants the most widely adopted infantry weapon of the late twentieth century.

American Battle Monuments Commission
http://www.abmc.gov
Affiliated with: Same
Contains information on all American military personnel who died in World War I or World War II, and all foreign cemeteries where they are buried.

Arador Armour Library
http://www.arador.com/main.html
Affiliated with: Sword Forum magazine
In addition to discussion forums on arms and armor, this site features photographic galleries from many of the world's leading military museums, as well as detailed discussions on the manufacture and use of armor throughout history.

Arms and Armor Collection of the Metropolitan Museum of Art
http://www.metmuseum.org/collections/department.asp?dep=4
Affiliated with: Metropolitan Museum of Art
The Metropolitan Museum of Art has one of the world's leading collections of military equipment, and this site presents an online version of a growing percentage of the museum's collection of arms and armor, focusing on Europe and Japan but with some representation from other regions.

Army Technology
http://www.army-technology.com/index.html
Affiliated with: Net Sources International
Provides current information about modern military equipment used by the armies of the world, including tanks, armored fighting vehicles, artillery, missiles, and helicopters.

Australian War Memorial
http://www.awm.gov.au
Affiliated with: Same
Contains photographs and reports, as well as vast array of genealogical information on Australians in World War I, World War II, and other conflicts.

The Aviation History On-line Museum
http://www.aviation-history.com/
Affiliated with: Aviation Internet Group
Details the history of civilian and military aircraft and includes text and photographic galleries primarily for U.S. engines, armaments, and aircraft, as well as discussions of avionics and the theory of flight.

British Association for Cemeteries in South Asia
http://www.bacsa.org.uk
Affiliated with: Same
Contains details on Britons and others from the British Empire who are buried in India and other parts of Asia, including much on soldiers and monuments in the region.

Center for Arms Control, Energy, and Environmental Studies
http://www.armscontrol.ru/
Affiliated with: Moscow Institute of Physics and Technology
Focuses on arms control connected with the various phases of the Strategic Arms Reduction Talks (START), beginning in 1986, between the United States and the Soviet Union, and details the ongoing nuclear capabilities of the two powers as well as the technical specifications for their arsenals.

Chemical and Biological Weapons Site
http://www.cdi.org/issues/cbw/
Affiliated with: Center for Defense Information

Presents an examination of the current chemical and biological capabilities of major nations and rogue states, as well as details about the effects of chemical and biological weapons on military and civilian populations.

Commonwealth War Graves Commission
http://www.cwgc.org
Affiliated with: Same

Contains details on the war graves maintained by the Commonwealth War Graves Commission, including details on all service personnel from the British Empire killed in World War I or World War II.

Documents in Military History
http://www.hillsdale.edu/academics/history/Documents/War/index.htm
Affiliated with: Hillsdale College

This primary source site contains more than three hundred documents on military history from ancient times to the modern era, including land, sea, and air campaigns. Although its focus is not primarily on military technology, many of the documents do discuss weapons, armor, and fortifications.

First Empire
http://www.firstempire.net
Affiliated with: First Empire magazine

Established by the leading magazine about the Napoleonic period, this site contains a number of sample articles from the magazine.

The French Army Museum
http://www.invalides.org/
Affiliated with: Government of France

Home of Le Musée de l'Armée, Hôtel National des Invalides, this site contains extensive selections from the holdings of the museum. Much of the focus is on the Napoleonic Era and World Wars I and II, although there are important images and texts from France's colonial history as well. Much of the collection is in French.

The Geometry of War
http://info.ox.ac.uk/departments/hooke/geometry/content.htm
Affiliated with: Oxford University

Applies and interprets geometry in its military application to Renaissance warfare. These applications include cartography, gunnery, and ballistics. Based on an exhibition at Oxford University.

The High Energy Weapons Archive: A Guide to Nuclear Weapons
http://www.fas.org/nuke/hew/
Affiliated with: Federation of American Scientists

Dedicated to nonproliferation and disarmament, this site provides extensive detail on the history, capabilities, and spread of nuclear weapons and technology over the past decades.

History and Archaeology of the Ship
http://www.history.bangor.ac.uk/Shipspecial/SHIP_int.htm
Affiliated with: Department of History and Welsh History, University of Wales, Bangor

An outlined history of military and commercial ships, from ancient vessels to early modern galleys, this site focuses on archaeological evidence to account for changes in technology and military applications.

The History Channel
http://www.historychannel.com/war/
Affiliated with: Same

Provides links to previous History Channel programs on military equipment and conflicts, as well as to book and video resources. The site also contains a detailed time line of history from 500 B.C.E. to the present, which includes many events of military significance.

The History Net
http://www.thehistorynet.com/
Affiliated with: Primedia History Group

Primedia is a publisher of a variety of military history journals, and this site features articles and source material from these periodicals, as well as additional materials on weapons and warfare from all periods of history.

Imperial War Museum
http://www.iwm.org.uk/
Affiliated with: Government of the United Kingdom

Contains representative text, photographic, and image collections from the holdings of the museum, taken primarily from British and Commonwealth military history.

Jane's Defense Information
http://www.janes.com/index.shtml
Affiliated with: Jane's Information Group

Provides extensive information about military equipment, contractors, arms purchases, weapons specifications, and intelligence about world events. Jane's is the world's leading private consulting group on military affairs and publishes standard works on military hardware.

Land Forces of Britain, the Empire, and Commonwealth
http://regiments.org/milhist/
Affiliated with: T. F. Mills, University of Denver

Provides detailed information about the historical structure, military equipment, weapons, personnel, and campaigns of the armed forces of the United Kingdom and its associated territories.

MagWeb
http://www.magweb.com
Affiliated with: Network Solutions

This subscription site contains thousands of articles from military and war-gaming magazines from around the world.

MILNET
http://www.milnet.com/milnet/index.html
Affiliated with: Same

This open-source intelligence site provides current information about the military forces of the world, including their equipment, interests, and rivals, with particular focus on those of the United States. Areas of military technology covered include ground forces, military aviation, space-based weapons, intelligence capabilities, and naval warships.

Museum of Antiquities
http://museums.ncl.ac.uk/archive/index.htm
Affiliated with: Society of Antiquaries of Newcastle upon Tyne and the University of Newcastle upon Tyne

This museum of archaeology in northeast England concentrates on the Roman era in Britain. In the collection are photographs of Roman weapons, fortifications, and armor, along with a virtual book on Roman military equipment.

Museum of Archaeology and Anthropology
http://www.museum.upenn.edu/Greek_World/Index.html
Affiliated with: University of Pennsylvania

Contains a text discussion of warfare in the lives of the ancient Greeks as well as photographs of Greek artifacts of war and representations of combat in artistic forms, taken from the museum's collection. Relevant sections of the online museum include warfare, hunting, chariots, horses, and daily life.

Napoleon
http://www.napoleon.org/index_flas.html
Affiliated with: Napoleon Foundation, Paris, France

Provides detail about the military campaigns of Napoleon I (Bonaparte) and Napoleon III through extensive image and text databases.

National Atomic Museum
http://www.atomicmuseum.com/
Affiliated with: U.S. Air Force

Provides image and text representations of the U.S. nuclear weapons program, including information about the Manhattan Project, the Cold War arms race, and the history of disarmament efforts.

Naval Historical Center
http://www.history.navy.mil/
Affiliated with: U.S. Navy

Provides image and photographic galleries, technical specifications, and the history of naval campaigns of the U.S. Navy since the American Revolutionary War.

Nihon Kaigun: Imperial Japanese Navy Page
http://www.combinedfleet.com/
Affiliated with: Jon Parshall, independent researcher

Based on years of research into the history of the Japanese navy, this site includes detailed representations of the armaments and equipment of Japan's air and sea forces of World War II. In addition, it provides operational histories of major Japanese vessels during the war and thorough discussions of ballistics, ship armor, and other technical areas, as well as details of both major and minor naval campaigns.

Official History of New Zealand
http://www.nzetc.org/projects/wh2/
Affiliated with: New Zealand Department of Internal Affairs and Victoria University of Wellington

Provides the official history of New Zealand in World War II.

Photos of the Great War
http://listproc.cc.ukans.edu/~kansite/ww_one/photos/greatwar.htm#TOP
Affiliated with: University of Kansas and Brigham Young University

This photographic database includes almost two thousand images of World War I, mostly from U.S. sources. Main areas of focus include weapons, equipment, military aviation, animals at war, and naval campaigns. Features include liberal rules for using images, as well as an accompanying link to a World War I text site.

Redstone Arsenal Historical Information
http://www.redstone.army.mil/history/
Affiliated with: U.S. Army

Provides historical, photographic, and technical information about U.S. military capabilities in space and about missile technology since World War II.

Regia Anglorum
http://www.regia.org/index.html
Affiliated with: Same

This living-history site includes photographs, descriptions, and illustrations of Anglo-Saxon, Viking, Norman, and British weapons, armor, and daily life from the period from 950 to 1066.

Royal Museum of the Army and Military History
http://www.klm-mra.be/
Affiliated with: Government of Belgium

The Royal Museum of the Army and Military History contains more than ten centuries of texts and artifacts from Belgian and world military history, and its Web site includes online exhibitions of main galleries and holdings, as well as a text and image database.

Springfield Armory National Historic Site
http://www.nps.gov/spar/home.html
Affiliated with: U.S. Park Service

The Springfield Armory, a National Historic Site, was for almost two hundred years a critical manufacturer of weapons for the U.S. military. Its online site demonstrates most of the equipment produced during the history of the armory, and its archive contains more than twenty-five thousand documents.

A Storm of Shot and Shell: Weapons of the Civil War
http://www.chipublib.org/003cpl/civilwar_catalog.html
Affiliated with: Chicago Public Library

This exhibit presents photographs, engravings, and illustrations of weapons of the American Civil War, taken from the collection of the library and including artillery, ammunition, and small arms.

Strategic Air Command Museum
http://www.sacmuseum.org
Affiliated with: U.S. Air Force

Contains an online exhibit of the bomber aircraft and other equipment used by the Air Force, as well as a virtual reality tour of the museum. The museum also features special exhibitions online, on a rotating basis.

The Tank Museum
http://www.tankmuseum.org/home.html
Affiliated with: Same

This online museum for the Tank Museum of Bovington in the United Kingdom presents some of the collection from the actual museum, which contains more than three hundred tanks and armored

fighting vehicles from more than twenty-five countries. In addition to photographs and illustrations, the site has detailed technical information for an increasing portion of its collection.

Trenches on the Web: An Internet History of the Great War
http://www.worldwar1.com/index.html
Affiliated with: History Channel Affiliate Program

Provides images, documents, maps, and other material about World War I. Also contains a book-search engine, discussion forums, poster sales, and extensive links to other sites.

U.S. Air Force Museum
http://www.wpafb.af.mil/museum/index.htm
Affiliated with: U.S. Air Force

This online presence of the U.S. Air Force Museum has special image collections, taken from the holdings of the Air Force, and is especially strong in the areas of aircraft weaponry, fighter and bomber engines, and ground equipment.

U.S. Army Ordnance Museum
http://www.ordmusfound.org/
Affiliated with: U.S. Army

The museum contains more than eight thousand artifacts, with the online collection focused on photographs and technical specifications primarily for U.S. tanks, armored fighting vehicles, and artillery.

U.S. Civil War Navies
http://www.tfoenander.com
Affiliated with: Terry Foenander, military historian

This site has a vast array of material on the Union and Confederate navies in the American Civil War.

War, Peace, and Security
http://www.cfcsc.dnd.ca/links/milhist/index.html
Affiliated with: Information Resource Centre, Canadian Forces College

A detailed site, organized by period, subject, and conflict, with links to archives, photograph galleries, texts, and other resources from the ancient era to the late twentieth century.

The War Times Journal
http://www.wtj.com/
Affiliated with: Same

Provides extensive archival information, photographs, and other materials about warfare from the Napoleonic era to World War II. Also contains an extensive collection of articles about conflicts in the nineteenth and twentieth centuries, as well as wargaming information and hundreds of links to other military history sites.

Warfare in the Ancient World
http://www.fiu.edu/~eltonh/army.html
Affiliated with: Department of History, Florida International University

The focus of this site is on Greek, Roman, and Byzantine warfare, with sections devoted to bibliographies of specific as well as comparative weaponry, fortifications, and other areas of military technology.

Web Sources for Military History
http://home.nycap.rr.com/history/military.html
Affiliated with: Richard Jensen, University of Illinois, with support from the Gilder-Lehrman Foundation, the National Endowment for the Humanities, the Japan Foundation, and the Luce Foundation

Provides a bibliography and extensive Web links to hundreds of military history and technology sites, especially those dealing with the modern era.

World War II Armed Forces Orders of Battle and Organizations
http://freeport-tech.com/wwii/index.htm
Affiliated with: Dr. Leo Niehorster, independent military historian and publisher

Thoroughly details the equipment, weapons, personnel, and campaigns of nearly all military forces involved in World War II down to the company level.

Wayne H. Bowen

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