

SMITHSONIAN





















Corinthian helmet

German armet

Samurai helmet

Pickelhaube

German infantry helmet

Kevlar infantry helmet



Flint arrowhead



Viking axhead



Spanish cavalry pistol

Rast and Gasser M1898 pistol

Dolne **Apache pistol**

Tokarev TT pistol



Fokker Dreidecker

Alexander

the Great

Fairey Swordfish

Ghengis Khan

Messerschmitt

Bf 109

Gustavus

Adolphus

Catherine the Great



Napoleon Bonaparte

Horatio



George Washington

Chinook CH-47



Sukhoi SU-27

Dwight D. Eisenhower



Avro Lancaster



Nelson

F-86F Sabre











LONDON • NEW YORK MUNICH • MELBOURNE • DELHI

Senior Editor Gareth Jones Editorial Team Hannah Bowen, Hugo Wilkinson, Alison Sturgeon, Steve Setford, Andy Szudek, Satu Fox Senior Art Editors Michael Duffy, Sharon Spencer Design Team Keith Davies, Steve Woosnam-Savage Photographer Gary Ombler Production Editors Ben Marcus, Tony Phipps Production Controller Linda Dare Picture Research Sarah Smithies, Roland Smithies Cover Designer Mark Cavanagh Managing Editor Stephanie Farrow Managing Art Editor Lee Griffiths US Senior Editor Rebecca Warren US Editor Jill Hamilton

Cobalt ID

The Stables, Wood Farm Deopham Road, Attleborough Norfolk NR17 1AJ **Managing Editor** Marek Walisiewicz **Managing Art Editor** Paul Reid **Editors** Richard Gilbert, Louise Abbott **Art Editors** Darren Bland, Lloyd Tilbury

DK India

Managing Editor Saloni Talwar Senior Editors Neha Gupta, Priyanka Naib Editorial Team Surbhi Nayyar, Suneha Dutta Managing Art Editor Romi Chakraborty Senior Designer Govind Mittal, Anis Sayyed Design Team Pankaj Bhatia, Amit Varma, Honlung Zach Senior DTP Designer Harish Aggarwal DTP Designers Vishal Bhatia, Jagtar Singh, Dheeraj Arora CTS Manager Balwant Singh Production Editor Pankaj Sharma Managing Director Aparna Sharma

First American Edition, 2012

Published in the United States by DK Publishing 375 Hudson Street New York, New York 10014

12 13 14 15 10 9 8 7 6 5 4 3 2 1 001—182907—Oct/2012

Copyright © 2012 Dorling Kindersley Limited All rights reserved.

Without limiting the rights under copyright reserved above, no part of this publication may be reproduced, stored in or introduced into a retrieval system, or transmitted, in any form, or by any means (electronic, mechanical, photocopying, recording, or otherwise), without the prior written permission of both the copyright owner and the above publisher of this book.

> A catalog record for this book is available from the Library of Congress

> > ISBN 978-0-7566-9838-6

DK books are available at special discounts when purchased in bulk for sales promotions, premiums, fund-raising, or educational use. For details contact: DK Publishing Special Markets, 375 Hudson Street, New York, 10014 or SpecialSales@dk.com.

Printed and bound in China by Leo Paper Products Ltd

Discover more at www.dk.com

CONSULTANTS

💭 Smithsonian

This trademark is owned by the Smithsonian and is registered in the US Patent and Trademark Office

Established in 1846, the Smithsonian—the world's largest museum and research complex—includes 19 museums and galleries and the National Zoological Park. The total number of artifacts, works of art, and specimens in the Smithsonian's collections is estimated at 137 million, much of which is contained in the National Museum of Natural History, which holds more than 126 million specimens and objects. The Smithsonian is a renowned research center, dedicated to public education, national service, and scholarship in the arts, sciences, and history.

SMITHSONIAN ENTERPRISES

Carol LeBlanc, Vice President Brigid Ferraro, Director of Licensing Ellen Nanney, Licensing Manager Kealy Wilson, Product Development Coordinator

SMITHSONIAN

Staff of the Division of Armed Forces History, National Museum of American History, Smithsonian

THE ROYAL ARMOURIES, UK Thom Richardson Keeper of Armor and Oriental Collections

Robert C. Woosnam-Savage Curator of European Edged Weapons

Jonathan Ferguson Curator of Firearms

Mark Murray-Flutter Senior Curator of Firearms

Trevor Weston Manager of Modern Military Firearms

Karen Watts Senior Curator of Armor and Art

Nicholas Hall Keeper of Artillery

Philip Magrath Curator of Artillery

ADDITIONAL CONSULTANTS Brian Lavery Curator of Naval History, National Maritime Museum, Greenwich, UK

Stephen Woolford MBE Head of Interpretation and Collections, Imperial War Museum, Duxford, UK

CONTRIBUTORS

R. G. Grant Philip Parker Ian Bottomley Charles Phillips Roger Ford Adrian Gilbert Malcolm Claridge

Weights and measurements given in this book are expressed in their metric and imperial equivalents, wherever the information is available. However, there are various different conventions for the measurements of caliber and displacement. Please refer to p.446 for further details.

INTRODUCTION

The development of arms and armaments is central to the story of military history. While the aims and intentions of humans at war have remained essentially the same since the very dawn of civilization, the history of weaponry and tactics has been a process of near-constant adaptation, reinvention, and progression, with the result that battlefield technology has grown increasingly effective, and ever more deadly.

The earliest weapons took the form of stone axes and clubs, but, with the adoption of bronze, and then iron, these were improved, developed, and then superseded. Swords, spears, and bows dominated the field of battle from the era of Ancient Egypt and Assyria to the high Middle Ages, until the introduction of gunpowder weapons in Europe in the 14th century. This invention heralded a sea-change in warfare, as human strength was aided and then all but replaced by chemical and mechanical power, a process that accelerated during the Industrial Revolution, with an exponential growth in the range and accuracy of weapon systems, both on land and at sea. War then reached the skies in the early 1900s, expanding the reach of military might across the globe, and, while the advent of the nuclear bomb in 1945 made the prospect of full-scale conflict almost too terrible to contemplate, it did not stop the pace of technological change in conventional arms during the rest of the century. In the modern age, the increasing sophistication of "smart" weapons has heralded a revolution in warfare, and we have reached an era in which human combatants are slowly being replaced by computer-controlled machines.

The following pages offer a beautifully illustrated account of this process, showcasing significant armaments and other military pieces across 5,000 years and a vast geographical range. However, this majestic book—a fruitful collaboration between leading military history writers and expert consultants from the Royal Armouries, the Smithsonian, and other specialist institutions—is much more than simply a catalog of weaponry. It offers gripping accounts of the key battles, landmark events, and historical figures whose legacies have changed the reality of warfare; it explores the role technologies and tactics played in determining the outcome of conflicts; and it charts the impact of these events on the balance of power and boundary, the rise and fall of nation and empire, and on the course of human history.



CONTENTS

Introduction

TO 500

CHARIOTS AND SWORDS

Introduction	12
Key Development: The First Warriors	14
Stone and Bone Weapons	16
Early Metal Weapons	18
Ancient Siege Warfare: The Siege of Lachish	20
Ancient Egyptian Weaponry	22
Key Development: Hoplites and Phalanxes	24
Hoplite Armor and Weapons	26
Phalanx and Cavalry: The Battle of Issus	28
A Greek Trireme: Olympias	30
Key Development: The Roman War Machine	32
Roman Legionary's Armor and Weapons	34
Key Development: The Engineering of Roman Conquest	36
Roman Fortification: Arbeia	38
Enemies of Rome	40
Key Development: Asian Traditions	42
An Ancient Chinese Army: The Terracotta Warriors	44

500-1500

KNIGHTS AND BOWMEN

12	Introduction	48
14 16	Key Development: The Weapons of Early Medieval Europe	50
18	Viking Weaponry and Armor	52
20	A Viking Longship: <i>Havhingsten Fra Glendalough</i>	54
22	Anglo-Saxons and Normans	56
24	Defeat of the Anglo-Saxons: The Battle of Hastings	58
26	Key Development: Armored Cavalry in Medieval Europe	60
28	Knights' Armor and Weapons	62
30	Full Steel Plate Protection: Medieval Armor	64
32	Knights' Helmets	66
34	A Clash of Knights: The Battle of Bouvines	68
36	European Swords	70
38	Key Development: Medieval Infantry	72
40	Infantry Armor and Weapons	74
42	Medieval Archers	76
	Long Range Power: Crossbow	78
14	Knights and Bowmen: The Battle of Crécy	80

Key Development: Sieges and the Art of Fortification	82
Medieval Fortification: Bodiam Castle	84
Key Development: Gunpowder Makes its Mark	86
Siege Engines and Early Cannon	88
Key Development: Arab and Turkish Conflict	90
The Middle East	92
The Crusades	94
Key Development: East Asian Warfare	96
Mongol Armor and Weapons	98
Steppe Horsemen: The Mongols at War	100
East Asian Weapons and Armor	102
Fortification on a Grand Scale: The Great Wall of China	104
Key Development: Warriors of Pre-Columbian America	106
Pre-Columbian Weaponry	108
Clash of Civilizations: Aztecs and Conquistadors	110



1500-1680

PIKES AND GUNPOWDER

Introduction	114
Key Development: Pikes and Muskets	116
Field Artillery and Naval Cannon	118
European Infantry Armor and Weapons	120
Simple But Effective Firearm: Matchlock Musket	122
Pikes and Matchlock Muskets: The Battle of White Mountain	124
Key Development: From Lance to Pistol	126
Cavalry Armor and Weapons	128
Key Development: The Islamic Empires at War	130
Ottoman Armor and Weapons	132
Cavalry and Cannon:	
The Battle of Mohacs	134
Mughal Armor and Weapons	136
Key Development: Warfare in East Asia	138
East Asian Swords	140
East Asian Weapons	142
Japanese Armor	144
Samurai and Foot Soldiers: The Siege of Osaka Castle	146
Key Development: European Naval Warfare	148
A Mediterranean Galley: Galera Real	150
The Age of Galleys: The Battle of Lepanto	154

1680-1815

FLINTLOCK AND BAYONET

Introduction	158
Key Development: 1 8th-century Uniformed Armies	160
Uniforms of European Armies	162
Plug, Socket, and Sword Bayonets	164
18th-century Swords	166
18th-century Guns	168
Flintlock Muskets and Bayonets: The Battle of Fontenoy	170
Riflemen of the American Revolution	172
Weapons, Uniforms, and Kit of the American Revolution	174
Key Development: The Development of Siege Warfare	176
Field Artillery and Naval Cannon	178
Early Modern Siege Warfare: The Siege of Namur	180
Key Development: Armies of the Revolutionary Era	182
French Revolutionary and Napoleonic Infantry	184
Uniforms of Chasseur and Cuirassier	186

158	British Uniform and Kit of the Napoleonic Wars	188
160 162	Weapons of the Revolutionary and Napoleonic Wars	190
164	Forefather of the Modern Rifle: Baker Rifle	192
166 168	Cavalry and Infantry Square: The Battle of Waterloo	194
170	Key Development: Naval Battles in the Age of Sail	196
	Naval Guns and Kit	198
172	Carronnades and Other Naval Guns	200
174	Navigation and Communication at Sea	202
176	Naval Swords	204
178	Naval Warfare in the Age of Sail: The Battle of the Nile	206
80	Weapons, Uniform, and Kit of an Ordinary British Sailor	208
182	British Naval Officer's Uniform	210
184	18th-century British Ship of the Line: HMS Victory	212





|8|5-|9|4

INDUSTRY AND IMPERIALISM

Introduction	218
Key Development: The Beginnings of Modern Warfare	220
Flintlock Muskets and Breech-loading Rifles	222
Flintlock and Percussion Pistols, and Early Revolvers	224
Metallic-cartridge Pistols	226
Early Repeating Rifles	228
Uniforms and Insignia of 19th-century Armies	230
Early Industrial Warfare: The Battle of Antietam	232
American Civil War Uniforms	234
Infantry and Cavalry Swords and Bayonets	236
Muzzle-loading Artillery	238
Key Development: The Wars of Empires	240
Manually loaded Repeater Rifles	242
Machine-guns	244
A New Kind of Firepower: Gatling Gun	246
Breech-loading Artillery	248
Imperial Firepower: The Battle of Omdurman	250
Clothing and Weapons of Africa and Oceania	252
Self-loading Pistols	254
Guerilla Warfare: Second Boer War	256
Military Medals Before 1914	258
Key Development: Steam, Ironclads, and the First Battleships	260
Battleships	262
The Age of Steam and Big Gun: The Battle of Tsushima	264
Japanese Pre-Dreadnought Battleship: <i>Mikasa</i>	266
Early Cruisers	270
Torpedo boats, Destroyers, and Submarines	272

1914–1945

THE WORLD WARS

Introduction	276
Key Development: Trench Warfare	278
Uniforms and Equipment	280
Heavy Machine-guns	282
Light Machine-guns and Machine-pistols	284
World War I Defenses: Bayernwald Trench	286
Field Guns, Siege Guns, and Howitzers	288
Trench-fighting Weapons	290
Trench Warfare: The Battle of Arras	292
Tanks and Armored Vehicles	294
World War I Tank: Mark V Tank	296
Communications and Equipment of World War I	298
Key Development: The Growth of Air Power	300
Reconnaissance and Fighter Aircraft	302
Bomber Aircraft	304
Fighter and Fighter-bomber Aircraft 1939–1942	306
Fighter and Fighter-bomber Aircraft 1943–1945	308
Bomber Aircraft 1939–1942	310
Bomber Aircraft 1943–1945	312
World War II Long-range Heavy Bomber: Boeing B-17 Flying Fortress	314
Bombs and Missiles of World War II	318
Transport, Reconnaissance, and Liaison Aircraft	320
Communications and Codebreaking Equipment of World War II	322
World War Era Medals	324
Key Development: Battles at Sea in the World Wars	326

Capital Ships	328
Super Dreadnought Battleship: USS <i>Texas</i>	330
Cruisers	334
Destroyers and Escorts	336
Submarines	338
An Amphibious Invasion Force: The Normandy Landings	340
Key Development: Air and Sea Battles	342
Aircraft Carriers	344
Carrier and Maritime Strike Aircraft	346
Air–Sea Combat: The Battle of Leyte Gulf	348
Key Development: Tanks and Infantry in World War II	350
Allied Armored Fighting Vehicles	352
Axis Armored Fighting Vehicles	354
World War II Armored Vehicle: T-34 Tank	356
Anti-tank Weapons	358
Trucks, Half-tracks, and Light Vehicles	360
Uniforms and Equipment	362
Self-loading Rifles	364
Personal Weapons	366
Water- and Air-cooled Machine-guns	368
Artillery	370
Airborne Assault: Operation Market Garden	372
Airborne Forces Uniforms and Kit	374
Resistance Weapons and Equipment	376
Nuclear Warfare: The Bombing of Hiroshima	378

1945-PRESENT

THE NUCLEAR AGE

Introduction	382	Attack/Reconnaisance Helicopter:	(0.0	Infantry Uniforms and Equipment	418
Key Development: The Cold War Era	384	AH-64 Apache	402	Sniper Rifles	420
Nuclear Bombers and Interceptors	386	Special Forces Weapons	404	Modern Frigates and Destroyers	422
Nuclear Attack Submarine: USS Nautilus	388	Medals of the Modern Era	406	American Aircraft Carrier:	
Key Development:		Key Development:		USS George Washington	424
Guerrillas and Terrorists	390	The Contemporary Era	408	Key Development:	
Assault Rifles	392	Fighter and Strike Aircraft	410	The High-tech Battlefield	428
Infantry Firepower	394	Stealth Ground-attack Aircraft:		Ground-missile Destroyer:	
US Marine Uniform and Kit	396	Lockheed F-117 Nighthawk	412	USS Donald Cook	430
Close Air Support:		Electronic Warfare		Post-war Submarines	434
Operation Cedar Falls	398	and Reconnaissance Aircraft	414	Counterinsurgency:	
Helicopters	400	Post-War Tanks	416	Combat in Afghanistan	436

10

Glossary	438
Index	440
Acknowledgments	446
e	





INTRODUCTION

Early humans developed weapons of wood and stone, such as clubs, axes, spears, and simple bows, for hunting and fighting; the growth of civilizations from around 3000BCE onward led to advances in both technology and organization.

The first military developments were slow, emerging over centuries, or even millennia. Stone weapons were gradually replaced by those of more effective materials—first copper and bronze, then iron and steel; meanwhile, missile weapons increased in range and penetrative power with the advent of the composite bow, and later, the crossbow. The invention of wheeled vehicles and the domestication of horses gave rise to the war chariot, which dominated battlefields from Egypt to China until, imitating the mounted warriors of central Asia, settled civilizations learned to fight on horseback. The building of fortifications led to the new art of siege warfare, and conflict also took to the sea, with oared war galleys operating in the Mediterranean by the 8th century BCE. In ancient warfare, fighting methods and organization were generally more important to success than technological superiority. The Assyrians conquered an empire with the world's first permanent professional army, in the 1st millennium BCE, and the Romans ruled the most famous of ancient empires with an army of professional legionaries who also excelled as military engineers, building roads, bridges, forts, and frontier fortifications. The Greeks, meanwhile, won renown for their tactical skills—whether as infantry in their tightknit phalanx formations, or at sea, maneuvering their lightweight galleys, the triremes.

None of the settled civilizations, however, were safe against the nomadic peoples—or "barbarians" as they were known—outside their borders. The "civilized" technological advantages of torsion catapults and crossbows counted for little against bands of mounted warriors, who were highly skilled in raid and ambush. East and West Asia, India, and Europe all faced severe problems from incursions by central Asian nomadic horsemen.

KEY DATES







0 C

5 0

0

F

S

Ω

Ľ

0

S W

Ω

Z

◄

CHARIOTS

One of the longest-reigning Egyptian pharaohs, Ramesses II led numerous military campaigns, taking armies into Syria to the east, Libya to the west, and Nubia in the far south. His main rival was the Hittite emperor, Mutawallis. The climax of his second Syrian campaign was the Battle of Kadesh in 1275BCE, a clash with the Hittites that involved large chariot forces on both sides. Ramesses survived a devastating charge by the Hittite chariots to emerge victorious.



▲ The head from a colossal statue of Ramesses II at the Temple of Abu Simbel, in southern Egypt.

► TUTANKHAMEN

The Egyptian pharaoh Tutankhamen (reigned 1332–1322 BCE) is depicted shooting volleys of arrows at his fleeing enemies. In reality, the king was a boy who would not have led his troops in battle.

▼ AN EGYPTIAN SPEAR

The thrusting spear was the main weapon of Egyptian infantrymen, particularly under the Old Kingdom (2686–2181BCE). Like many ancient armies, the Egyptians fought in phalanxes, which opponents found difficult to penetrate.



THE FIRST WARRIORS

The birth of advanced civilizations in the Near East, around 3000BCE, heralded the emergence of organized military forces. Over the next 3,000 years, a series of technical developments led to advances in weaponry, which in turn shaped the development of military tactics.

While it is likely that there was conflict of some sort between groups of hunters before agriculture began, a permanent warrior class only arose with the first farming communities, which needed to protect their surpluses. The earliest agricultural societies built defenses (such as the walls of Jericho, in around 8000BCE) and adapted stone hunting weapons for use in battle, leading to the invention of weapons such as the mace. It was not until the rise of the city-states of Sumeria, however, in the late 4th millennium BCE, that true organized armies began to appear.

THE RACE FOR COPPER

The discovery of copper-refining methods around 4500BCE led to the manufacture of the first metallic weapons, and may also have set off competition between city-states for access to the copper mines of Anatolia. These two factors contributed to the endemic state of war between Sumerian city-states, such as Uruk, Ur, and Kish, during the 4th and 3rd millennia BCE. Sumerian soldiers fought largely on foot, armed with long spears and arranged in







phalanxes—units comprising densely packed rows of troops. They were supported by cumbersome, four-wheeled battle-wagons drawn by onagers (a species related to the horse family).

The Akkadians overcame the Sumerians in around 2350BCE. Under a leader named Sargon, they established the first empire in the Near East, uniting the lands of many city states. Sargon was the first military leader to make use of archers on a large scale, giving the Akkadians a crucial advantage against their less versatile foes.

THE RISE OF BRONZE

In the second millenium BCE, two technical innovations occurred that would shape warfare in the ancient Near East for another thousand years. The first of these was the introduction of bronze. Emerging around 2800BCE, this alloy of copper and tin gave a more durable, sharper edge to weapons than copper alone. Until the technique of bronze-making became widely known, it was prohibitively expensive, but by around 1800BCE, bronze had replaced copper as the predominant metal used for armaments. At about the same



time, horse-drawn chariots with two wheels also appeared, adding a new, highly mobile dimension to warfare.

From around 1300BCE, the Egyptian army previously an almost entirely infantry force—was radically reorganized under the influence of the Hyksos, a group of foreign invaders who introduced chariots, bronze swords, and metal scale armor. This coincided with an era of Egyptian imperialism, when the armies of pharaohs such as Ramesses II expanded into the Levant and engaged in bitter struggles with rival kingdoms such as the Hittites.

THE AGE OF IRON

By around 1000BCE, iron, being stronger than bronze, was becoming the metal of choice for weapons. It was exploited to lethal effect by the Assyrians (see pp.20–21). During the reign of Tiglath-Pileser III (745–27все), Assyria established the world's first standing army, which, when boosted by drafting, numbered over 100,000 men. They wielded the longer swords that iron made possible, and were protected by knee-length metal tunics. Assyrian tactics combined the well-orchestrated push of a heavy phalanx of infantry, with supporting fire from archers and slingers, and assaults by auxiliary units of heavy cavalry and charioteers. With a clear chain of command and a reputation for ferocity and cruelty against their enemies, the Assyrian army was the most formidable fighting force the ancient world had yet produced.

▲ AN ASSYRIAN VICTORY This relief of the Battle of Til Tuba (655BCE) shows the Assyrian archers and spearmen who drove their Elamite foes into the Ulai River, where thousands drowned. The Elamite ruler, Teumanni, was captured and executed.

KEY **EVENTS**

2600-750bce

■ 2600BCE A Sumerian artifact known as the Standard of Ur provides the first depiction of an organized army, with mosaic scenes showing rows of infantry carrying spears and battle-axes, accompanied by onager-drawn battle-wagons. The infantry have no shields or armor.

■ **2000BCE** The first metal swords appear in Mesopotamia as bronzemaking spreads and the metal becomes cheaper to produce.

c.1300–1250BCE New Kingdom Egypt undergoes its period of greatest expansion, while chariot warfare reaches its peak. The Hittite empire disintegrates, after which a period of disorder reigns in the Near East.

c.1000–750BCE The introduction of iron weaponry aids the expansion of the Assyrian empire. Assyria is the dominant military power in the Near East by 750BCE.

"I tore down... their towns and set fire to them, and turned them into forgotten mounds"

ASSYRIAN RULER SENNACHERIB, ON A REVOLT BY THE CHALDAEANS, 703BCE

STONE AND BONE WEAPONS

The first human tools were made of stone, bone, or wood. The earliest were simple pebble choppers and scrapers, but by around 1.75 million years ago, these had developed into the first hand axes-shaped blades-that could be gripped firmly in the hand to strike an enemy. Gradually, the blades became narrower and sharper, most often made of flint, a stone that was hard but could be easily shaped. Wooden shafts were bound to sharp blades to form axes and spears, and eventually-with the invention of the bow-to act as arrowheads, vastly extending the range at which the warrior could attack. Most early stone weapons were made with multiple uses in mind, from domestic tasks to hunting, as well as warfare.

▼ ATLATL

Date c.10,500BCE
Origin France
Length Unknown
Origin France Length Unknown

Atlatls, or spear throwers, were developed around 20,000 years ago. They increased a spear's velocity and range, which allowed the bearer to kill prey from a greater distance. This reindeerivory example is carved as a mammoth.



mammoth leas

Handle in shape of

Tang to attach

arrowhead to shaft

▼ SERRATED FLINT KNIFE

Date 1,500,000-10,000bce

Origin Unknown

Length 8in (20cm)

The invention of the bow during the Paleolithic period made it possible to shoot projectiles at great range and with accuracy. Because these flint arrowheads were barbed, they embedded themselves deep in the victim's flesh.

Triangular point

Serrated edges were developed

other tough materials. However,

knife could also inflict savage cuts.

for sawing through bone or

the jagged flint edges on this



Serrated teeth for sawing



Origin UK Length 8in (20cm)

Adding wooden handles gave axes greater reach and power, enabling the bearer to attack from a safer distance. This stone axehead was dredged from the Thames River in London.

▼ OLDUVAI CHOPPER

Date Up to 2.5 million years ago Origin Africa Length Unknown

Olduvai tools are among the oldest known deliberately shaped objects, first appearing around 2.5 million years ago. Choppers such as this were versatile tools, used as cutting edges and scrapers, and for bludgeoning prey.



► FLINT HAND DAGGER **Date** c.2000bce Origin Unler

Jrigin	Unknown
ength	12in (30cm)

The addition of wooden shafts to flint blades, bound with sinew or leather strips, created stabbing spears, and allowed the bearer to use the full force of his arm to strike blows.

Wooden shaft

16





▲ BONE HARPOON

Origin Unknown

Length Unknown

Date c.28,000–13,000BCE

◀ HAND AX Date 250,000–70,000bce

Stone Age hunters did not use just stone

end of the last Ice Age, 30,000–15,000

for their weapons. From toward the

years ago, many weapons of bone

survive, such as this harpoon, which

Origin Unknown Length 6in (15cm)

The first hand-held weapons, hand axes were essentially small rocks shaped to form a handgrip and blade. They were useful both as domestic tools and for attacking enemies.

> Fluted groove caused by striking off flakes

► SMALL CLOVIS POINT

Date c.10,000bce Origin North America Length 4in (10cm)

Broad end for

Clovis points were made by alternately flaking off pieces from both sides of the core, creating fluted edges. They were a characteristic feature of the weapons used by settlers in North America from around 15,000 years ago. Clovis points were replaced by shorter and thinner Folsom points 8,000 years ago.



Originally attached to shaft

Cutting edge

Indentations where flint

flakes were struck off

► FLINT DAGGER HEAD

Date c.2000BCE Origin Unknown

Length		th	6in (15cm)				

By the Neolithic period, sophisticated blades such as this dagger head were being made by striking off flakes from a hard flint core, producing a sharp, flat blade.

Sharp broad point



Pointed flint blade

► LEVALLOIS FLAKE POINT

Date Post-300,000BCE

Origin Unknown

Length Unknown

The Levallois point was made by flaking off points from a central flint core to create the pattern of the desired shape, which was then struck off to create the final object. It had a characteristic scarring pattern on its surface.



S

TON

 \triangleright Z D В

0

z

×

П

 \triangleright P

0

Z

 \mathbf{S}

EARLY METAL WEAPONS

The first organized armies, those of the Sumerians, are recorded in around 3000BCE. While heavy war wagons were used, the Sumerians fought largely on foot and carried spears and shields. The development of the spoked wheel enabled much lighter, faster vehicles to be built-open chariots, from which archers could shower enemies with arrows. Thus, chariot warfare came to dominate conflict in the Near East in the second millennium BCE. But as advances in horse breeding produced more robust animals, mounted archers-even faster and more maneuverable than chariots-became more valuable to armies in the region, together with infantry foot soldiers equipped with spears, swords, and daggers.



▲ SUMERIAN DAGGER	
Date c.2500bce	
Origin Sumeria	
Length 8–12in (20–30cm)	

This ornate ceremonial dagger was excavated from the tomb of Queen Pu-Abi at Ur. Its blade and scabbard are crafted in gold, while the hilt is made from lapis lazuli trimmed in gold.



Scabbard with relief decoration of animals and mounted men

▲ PHOENICIAN DAGGER Date 18th century BCE Origin Phoenicia Length 15³/₄in (39.3cm)

The Phoenicians occupied trading cities of the Levantine coast and were known more as merchants than as warriors. This magnificent gold and ivory dagger and scabbard signified the bearer's wealth and were not intended for military use.



▲ ASSYRIAN SCALE ARMOR Date 1800–620все Origin Assyria Length 2in (5cm)

Assyrian soldiers wore a sariam, a long coat made of lamellar armor. Bronze scales, such as these, were laced together through holes punched in the side. A complete set of armor consisted of up to 1,000 scales, weighing 33-55lb (15-25kg).

Double-edged blade





Cheekguards to protect face

▲ HELMET OF

MESKALAMDUG **Date** c.2500bce Origin Sumeria Length 8¹/₂in (22cm) Material Gold, silver This ceremonial, gold-and-silver alloy helmet was found in the tomb of Meskalamdug at Ur in Sumeria. It is known as a wig helmet because of the intricately carved imitation of hair on the crown.

Crescent-shaped blade

Hair-effect

decoration

PERSIAN **BRONZE AXEHEAD**

Date 10th-7th century BCE Origin Persia Length 8in (20.5cm)

The blade on this spike-butted ax is set at an angle, which would have been impractical in combat, suggesting that the ax was for ceremonial use.



ANCIENT SIEGE WARFARE

THE SIEGE OF LACHISH

By the 8th century BCE, the Assyrian empire had an army of unprecedented size and efficiency. Its assault on the fortified town of Lachish, recorded in reliefs in the Assyrian palace in Nineveh, demonstrated sophisticated, if well-established, siege techniques and the calculated use of terror.

The army that King Sennacherib led to Judah in 701BCE comprised a mixture of foot soldiers and mounted troops on chariots or on horseback. There was also a dedicated body of engineers, skilled in building earthworks and siege machines. The army's mission was to crush a revolt by the Judean King Hezekiah, and to impose exemplary punishment to deter any further resistance to Assyrian imperial rule.

The Assyrians' principal missile weapon was the composite bow. Capable of shooting an iron-tipped arrow to an effective range of over 820ft (250m), it was used by charioteers and horsemen, as well as by troops on foot. Assyrian foot soldiers also employed slingshots, flinging shaped stones a distance of 330ft (100m). Both of these were deadly anti-personnel weapons, and during a siege arrows could be turned into incendiary devices by dousing their tips in flammable pitch. Neither arrows nor small stones posed any threat to the high mud walls of Lachish, however, which presented a formidable challenge, even to an armed force that must have far outnumbered the defenders.

To force entry into a walled town, the Assyrian troops had to advance to the walls and find ways either to breach them or go over them. Assyrian engineers had developed a range of techniques for assailing fortifications. They could attack the foundations, digging at the base of the walls to undermine them; they could build a ramp against a wall or tower, allowing troops a route to the summit of the battlements; they could attack the walls with siege towers and metal-tipped battering rams. Or, more simply, troops armed with spears and swords could be sent forward with ladders to scale the walls or fortifications.

SIEGE TOWER AND INFANTRY

At Lachish, engineers built a ramp of rocks and earth reaching to a point halfway up the fortifications. At the same time they assembled a large siege tower, with a ram in its lower story. Mounted on four wheels, the wooden tower was covered in hides and canvas. When the Assyrians were ready to attack, they manhandled the tower and ram up the ramp. While archers in the tower's upper story shot at the defenders, soldiers battered the ram against the exposed wall. The defenders fought back against the assault, throwing rocks and flaming torches onto the tower, but the Assyrian soldiers kept water-filled buckets in the tower for extinguishing the resulting fires. Meanwhile, tightknit groups of soldiers on foot launched a secondary assault on the walls, armed with spears and protected by shields and armor. Assyrian bowmen supported this advance with a barrage of arrows directed at the defenders on the walls, each bowman sheltered by a curved reed screen held by his shield-bearer.

The exact sequence of events leading to the fall of the town is not known, only that the Assyrians overcame the town's defenses. The aftermath of this victory, depicted in reliefs for the king's enjoyment, involved the cruel execution of a large number of Judeans and the exile of the survivors.



LACHISH UNDER SIEGE Made to decorate the walls of King Semnacherib's palace in Nineveh (in modernday Iraq), this relief shows the Assyrian siege tower rolling up a ramp to batter the defensive wall with its ram, while archers shoot at the defenders.

E

Ø

*

ANCIENT EGYPTIAN WEAPONRY

Egyptian soldiers were mainly peasant conscripts who fought almost exclusively on foot until around 1500BCE. The archers were the most important component of the army, and they carried light bows with a range of about 165ft (50m). The other infantry, known as the *nakhtu-aa* ("strong-armed"), fought in close formation using battle-axes and spears. Both types of warrior also carried a dagger in a leather scabbard, which was often strapped to the lower arm. For protection, the archers relied on a leather kilt, while the infantry carried a large, wooden-framed shield covered with cowhide. After the beginning of the New Kingdom in around 1550BCE, the Egyptian army began to use chariots,

V BRONZE SPEARHEAD

Date с.2000все	equipped with a spear, wh
Origin Egypt	 generally used for thrusting than throwing. Before arous
Length 10in (25cm)	the blade was lashed to the
Length 10in (25cm)	the blade was lashed to

Egyptian infantrymen were usually ich was g rather nd 1500bce, haft rather than inserted into a socket





▲ SHORT SWORD



Swords were probably introduced in the New Kingdom by invaders from the eastern Mediterranean, known as the "Sea Peoples." This broad-bladed short sword is a display weapon that probably belonged to a member of the royal family

Leaf-shaped blade

▲ SICKLE SWORD Date 1200–1000все Origin Egypt Length 23¹/2in (60cm)

The *khepesh*, or sickle-sword, came into use at the start of the New Kingdom. The curved blade had its cutting edge around the outside. The weapon was wielded more like an ax than a sword, and heavier specimens could be used to rip an opponent's armor open, leaving him vulnerable to blade thrusts.

Wooden haft

► LION SHIELD

Date c.1325BCE Origin Egypt Width 21¹/4in (54cm)

Diamond-pattern chain decoration The soldier's shield had a slightly convex shape. This protected the sides of his body and helped him push against a densely packed line of opponents. This ornate display shield from the tomb of Tutankhamen shows the Pharaoh in the shape of a sphinx trampling his enemies.



▲ PHARAOH'S DAGGER

Date c.1325BCE Origin Egypt Length 12¹/2in (31.9cm) This dagger was found with the mummy of Tutankhamen and, with its golden blade and ornate golden sheath, was intended strictly for ceremonial use. The falcon on the hilt symbolized protection for the Pharaoh in the afterlife.





Cutting edge

KEY **BATTLE SALAMIS** 480bce

During the second Persian invasion of Greece, Athenian admiral Themistocles tricked Xerxes's Persian flotilla-three times the size of Themistocles' force of 378 triremes-into entering the Straits of Salamis. In the narrow waterway, the Persian force could not exercise its numerical advantage, and was badly mauled by the Greek ships.



The Greek navy triumphed at Salamis through ingenious use of the terrain and waterways

► ALEXANDER THE GREAT

brilliance enabled him to defeat superior forces, which in turn allowed him to conquer the Persian empire within three years.

KEY DEVELOPMENT HOPLITES AND PHALANXES

Around 700BCE, a new type of foot soldier emerged in Greece. The hoplite, equipped with a long spear, a sword, an elaborate bronze corselet and helmet, and a large wooden shield (aspis, or hoplon), would form the backbone of Greek armies for the next 500 years.

The earliest examples of hoplite equipment date back to about 710BCE, and within half a century of this date, depictions on vases show hoplites fighting in their signature tactical formation-the phalanx. Composed of rows of spear-wielding hoplites, the phalanx was normally eight men deep. With spears of around 95–105in (240–70cm) in length, only the first three ranks could reach the enemy line, but the phalanx's structure presented a fearsome barrier.

In the 7th and 6th centuries BCE, the main hoplite

tactic involved colliding with the opposing phalanx,

followed by concerted pushing and stabbing. There was little tactical sophistication, and the encounters continued until one side broke and fled. Only the hoplite's left side was fully protected, thanks

of his neighbor.

to the hoplon (shield) of the man next to him: as a result, the phalanx tended to drift to the right, as each man tried to edge behind the hoplon

By the early 5th century, bronze

corselets had been superseded

by linen or scale leather armor,

of movement. When Darius of

Persia invaded Greece in 490BCE, the lightly armed Greek phalanx charged the Persian archers at Marathon, neutralizing one of their opponents' key advantages, and aiding an unlikely Greek victory against significant odds. Eleven years later, at Plataea, a renewed Persian invasion was defeated by the hoplites of Sparta, a militarized Greek city-state that trained its warriors from childhood. Sparta's rival, Athens, also participated in the land campaign against the Persians, but its most valuable contribution was a fleet of triremes-fast ships powered by triple banks of oarsmenthat outmaneuvered the Persians to victory at Salamis, in 480BCE.

allowing the wearer more freedom

With the Persians defeated, Sparta and Athens clashed for almost the next 80 years, resulting in the Peloponnesian War (431–04BCE), which, although bloody, showed only a few innovations in equipment and tactics. The armies began to make more use of archers, and employed flexible light infantry, called peltasts, as skirmishers, armed with

24

C 0

5 0

0

F

S

Ω

Ľ

0

S W

AND

CHARIOTS

javelins and swords. However, almost as soon as Sparta emerged victorious in 404BCE, its power was challenged by the Thebans, led by Epaminondas.

THE EVOLUTION OF THE PHALANX

The Thebans deepened their phalanxes to 12 ranks or more, made greater use of cavalry, and trained an elite force known as the Sacred Band. This helped them win a stunning victory at Leuctra, in 371BCE, which broke Spartan supremacy. However, Theban dominance was short-lived and Greece fell into civil wars, ending with the rise of Macedon, first under Philip II and then Alexander the Great.

The Macedonians further deepened the phalanx to 16 ranks, and their soldiers carried the *sarissa*, a longer spear of up to 20 feet (6m), which allowed the first five rows to strike at the enemy. These armored "phalangites" kept enemy infantry pinned down, while heavy cavalry, slingers, and peltasts launched their attack.

"Like some **ferocious beast** as it turns at bay and **stiffens its bristles**"

PLUTARCH, DESCRIBING THE APPEARANCE OF A PHALANX, c.100ce



25

key **events** 725–300bce

c.725–700BCE The earliest known war between Greek city-states (the Lelantine War between Chalcis and Eretria) is thought to have been fought in this period. Hoplite armor is also thought to originate in this era.

c.650BCE The earliest depiction of hoplites in art shows them without swords, but carrying two spears: one for thrusting and one for throwing.

■ **492–90BCE** The first Greco-Persian War takes place. Darius I of Persia invades Greece, attracting some allies in the north, but is defeated by the Athenians and their Plataean allies at the Battle of Marathon (490BCE), in which the Plataean hoplites surprise the Persians by charging into their ranks.

431–04BCE Spartan and Athenian forces clash in the Peloponnesian War.

■ **480BCE** Xerxes launches the second Persian invasion of Greece. The Persians are delayed by Spartan resistance at Thermopylae (480BcE). They are then defeated at Salamis (480BcE) by the Athenian navy, and at Plataea (479BcE), where Spartan hoplites break through the Persian line, causing the Persian army to flee.

378BCE The Thebans, under Epaminondas, destroy the Spartan army at the Battle of Leuctra, marking the beginning of the eclipse of traditional hoplite forces.

338BCE At Chaeronea, Philip II of Macedon defeats the Thebans by feigning a withdrawal, stretching one wing of the Theban army in pursuit. Philip's son, Alexander, then charges the enemy's left wing with cavalry, routing it. The Theban Sacred Band is destroyed.

33IBCE The Battle of Gaugamela takes place. A Macedonian attack on the left wing of the Persian army, opens up a gap in their ranks, into which Alexander advances. This flexible approach is far in advance of traditional hoplite tactics.

A HOPLITE CHARGE

This vase shows Greek hoplites running into battle, their Corinthian helmets, horschair crests, bronze greaves, and spears clearly visible. The artist has not depicted the other ranks in the phalanx, which made it even more intimidating to behold.

HOPLITE ARMOR AND WEAPONS

For four centuries from 700BCE, heavily armed citizen-soldiers called hoplites ("armed men") formed the armies of the Greek city-states. Each soldier typically provided all of his weaponry and armor at his own expense: a bronze corselet (made up of a bell-shaped breastplate and backplate), a helmet, greaves, a sword, a spear, and a large round shield. Fighting in tightly packed phalanxes, the soldiers were very well protected, although still vulnerable to spear-thrusts around the groin and throat, or to wounds inflicted by missiles before they closed in on the opposing army's line.



CORINTHIAN HELMET Date Late 7th century BCE Origin Greece Material Bronze

The Corinthian was the most common form of hoplite helmet, made from a single piece of bronze. It protected the whole head, with only a T-shaped opening for the eyes, nose, and mouth. An inner lining helped cushion the wearer's head.

> Molding to represent warrior's muscles _

► LATE CORINTHIAN HELMET

Date 6th century BCE Origin Greece Material Bronze

More developed Corinthian helmets, such as this example, had sharply angled side pieces and thinner, more delicate nose protectors with a more pronounced neck guard. It is the type of helmet most commonly depicted on Corinthian vases.



Single bronze piece forms helmet

Shaped to fit contours of leg ____

▲ ATTIC HELMET

Date 5th century BCE Origin Greece Material Bronze

The Attic helmet was a further development of the Chalcidian a type that had more rounded cheekpieces than the Corinthian. However, the Attic gave lighter protection, with more space around the ears and hinged cheekflaps. It was often decorated on the front above the forehead.





▲ BRONZE CUIRASS

Date 8th century BCE
Origin Greece
Material Bronze

The backplate of the hoplite cuirass was secured to the front with hinges and rings for leather straps. The front was molded to the contours of the wearer's torso, suggesting that these cuirasses were probably crafted for individuals. Full plate cuirasses fell out of fashion around 500BCE.

BRONZE GREAVES

Date 6th century BCE
Origin Greece
Material Bronze

While the hoplite's thighs were covered by his shield, the greaves protected the knees and shins. The greaves were thin and shaped to the wearer's legs, allowing them to be snapped into place without the need for straps or ties.



Length 12¹/4in (31cm)

The spear was the hoplite's main weapon; the *kopis* (short sword) was used only if the spear broke during fighting. Originally hoplites carried two spears that could be thrown, but these were later replaced by one long, thrusting spear.

> Indentation for bronze securing ring

Socket for spear shaft

Broken tip

▲ HOPLITE SPEAR BUTT

Date 4th century BCE Length 15in (38cm)

As hoplite spears grew longer, particularly from the 4th century BCE in the phalanxes of Philip of Macedon and Alexander the Great, they needed a counterweight to balance the spear point at the other end. The spear butt provided this support and could also be used as a weapon if the spearhead broke.

Scorpion was Spartan symbol of the city of Geronthrae

27

THE ALEXANDER SARCOPHAGUS This representation of the Battle of Issus appears on a sarcophagus made in the 4th century BCE. After his victory at Issus, Alexander continued his invasion of the Persian Empire, finally defeating Darius at Gaugamela in 331BCE.



PHALANX AND CAVALRY THE BATTLE OF ISSUS

The Macedonian army of Alexander the Great achieved remarkable conquests in the 4th century BCE, invading and destroying the mighty Persian Empire. Alexander's defeat of the Persians at Issus in 333BCE exemplified the Macedonian use of infantry phalanxes flanked by heavy cavalry.

As Alexander advanced along the eastern Mediterranean coast, the Persian ruler Darius III led an army through Syria to intercept him, reaching the sea behind Alexander's line of march. The Macedonians turned back and confronted Darius at Issus on a plain between the sea and the foothills of the Amanus Mountains. Alexander's army was outnumbered—possibly 40,000 men to the Persians' 100,000—but the restricted battlefield made it difficult for Darius to use his larger force to outflank the Macedonian line.

The Persians took up a position behind a river, fortifying its banks with wooden palisades. On the other side of the river, Alexander arranged his forces in a traditional fashion. His elite Companion cavalry took up position on the right, by the foothills, and the subsidiary Thessalian cavalry on the left, beside the sea. In the center were the infantry-most of them organized into tightknit phalanxes armed with long, twohanded sarissa pikes. The Macedonian phalanxes were usually 16 ranks deep, but at Issus the ranks were thinned to eight to spread the troops more widely. The Macedonians also deployed more flexible hypaspists-elite infantry equipped with shorter spears, swords, and pikes—and swarms of light skirmishing troops armed with bows, javelins, and slings.

Darius opened the battle, sending soldiers to infiltrate through the hills, but the Macedonian skirmishers countered this outflanking maneuver, halting the Persians with arrows and stones. The main body of heavily armored Persian cavalry, supported by slingers running alongside the horses, charged along the beach on the Macedonian left, but was contained and then repulsed by the Thessalian horsemen. In the center, Alexander ordered his infantry to advance against the Persian line, where Greek mercenary hoplites employed by Darius were drawn up in phalanxes with their traditional bronze armor, shields, and spears. As the Macedonian foot soldiers began to ford the river and scale the palisades on the far side, their own phalanxes lost formation, opening gaps in the ranks of pikes into which the enemy could penetrate.

TACTICAL PROWESS

The struggle in the center, however, was not Alexander's main tactical gambit—he intended to triumph through a cavalry charge on the right. With Alexander himself at their head, the Companion cavalry rode forward. The horsemen wore bronze cuirasses and helmets, but did not carry shields. Each was armed with a lance and a sword, mostly the curvaceous kopis. Having neither saddle nor stirrups, the men gripped their mounts firmly with their knees as they smashed into a mix of Persian light infantry, archers, and cavalry. The point of attack was well chosen, and the Persian left wing collapsed in the face of the onslaught. Already engaged with the Macedonian infantry to their front, Darius's Greek mercenaries were now exposed to cavalry attack from the flank and rear. Darius himself, on a command chariot behind his army, was also under threat. The Persian emperor fled the field, leaving his soldiers to be massacred or to scatter in search of safety.

GREEK TRIREME

OLYMPIAS

The Greeks were famed for their naval prowess, using light, fast galleys called triremes. No trireme has survived from antiquity, but the *Olympias* is a reconstruction based on historical evidence.

A Greek trireme was a shallow-draft vessel some 115ft (35m) long and less than 20ft (6m) wide. It cruised under sail, but in battle it was propelled by 170 oarsmen – all free citizens – in three tiers: 62 thranites on top, 54 zygians in the middle, and 54 thalamians at the bottom. With around 30 other men completing the crew, including marine hoplites and archers, it was a crowded vessel. There was room to carry only a few basic supplies and insufficient space for the whole crew to sleep on board. The *Olympias* was built at Piraeus, Athens, between 1985 and 1987. It proved highly maneuverable in sea trials, reaching speeds of almost 8 knots under oar and turning around in twice its own length. In action, a trireme with a skilled helmsman and a disciplined crew could ram an enemy vessel or ride over its oars, then reverse and leave it crippled in the water. If its own hull was holed, a trireme would not sink because it was made from buoyant wood such as pine, poplar, or fir.

PROW AND HULL

► SAILING AT SPEED Under sail, and with a favorable wind, the *Olympias* achieved a speed of almost 11 knots.

A trireme's prow terminated in a bronze-clad ram for holing the hulls of enemy galleys in battle. The ram on the *Olympias* weighs 440lb (200kg).

▲ EAR AND ANCHOR

Sailors dropped and weighed anchor from platforms called *epotides* (ears) near the prow. The ears also protected the thranite oarsmen behind.

► OUTRIGGER

Built out from of the hull, the outriggers allowed the thranites on the upper tier to row from a position outboard of the two lower tiers.





THE OLYMPIAS

The side view shows the arrangement of the two sails and the three tiers of oar ports. The plan view shows the position of each individual oarsman's seat.



◄

 \mathbf{S}

RIOT

◄

Η

U

OARS AND OARSMEN



▲ THRANITES' BENCHES The rowers on the topmost tier, the thranites, had the toughest job, because of the angle at which their oars entered the water. Consequently, they commanded higher wages than the other rowers.





▲ SEATS FOR OARSMEN The rowers' conditions were cramped. Each seat was level with the shoulders of the oarsman on the tier below.

STEERING THE BOAT



▲ VIEW FROM THE STERN The helmsman, who steered using a pair of tillers, overlooked the central slot between the decks, where the mast was stowed when not in use.



▲ TILLER A single helmsman normally controlled both tillers, but if more force was required a man was assigned to each one.



▲ FOOT STRETCHER

The crew of the *Olympias* experimented with various rowing techniques, including securing one foot to the stretcher.



▲ TIERS OF OARS The tiers were staggered to prevent oars from clashing. The lowest oars had leather sheaths to keep water out of the hull.



▲ STEERING OAR Operated by the tillers, the pair of steering oars (rudders) could also be used as brakes to slow the ship's forward movement.

KEY DEVELOPMENT

THE ROMAN WAR MACHINE

Until the collapse of the western Roman empire in the 5th century CE, the Roman legions formed the most formidable army of the Ancient World. Primarily an infantry force, it underwent a number of changes during its time of dominance.

The early Roman army was a citizen militia, drawn mainly from the wealthier classes. It owed its early successes to Rome's ability to conscript large numbers of recruits in times of war, and to its formidable tactical organization and training, which were far superior to those of its Italian enemies. The early legions had three categories of heavy infantry-the hastati, who were the least experienced, the principes, the best-quality troops, and the *triarii*, the veterans. The hastati and principes were armed with heavy javelins (*pila*), whereas the *triarii* had thrusting spears (hastae). The legionaries were protected by bronze helmets and semi-cylindrical body shields and, from the mid-3rd century BCE, they were armed with a short sword—the gladius hispaniensis —that became known as their signature weapon.

Drawn up in these three lines—each divided into 10 maniples (units) of around 150 men the legion fought in much the same way as many ancient armies. Supporting cavalry (*equites*) and light infantry (*velites*) would attempt to turn the enemy flank, while the heavy infantry tried to breach their opponents' line. Few armies could match the Romans in number or skill, but the legion suffered major setbacks when faced with the tactical genius of the Carthaginian general Hannibal, during the Second Punic War.

THE MARIAN REFORMS

Although the Roman army ultimately won the Second Punic War, its performance during the 2nd century BCE was lackluster and it struggled in

key **figure** JULIUS CAESAR

100-44bce

Roman general Julius Caesar secured his reputation in a series of campaigns in Gaul, from 58 to 50BCE, securing large new provinces for Rome. Dogged and tactically adept, Caesar ruthlessly suppressed tribes who opposed

him, such as the Belgae and Nervii, and was made dictator for life. Soon after, however, he was assassinated.

At the time of his assassination, Julius Caesar was planning further military conquests, of the Dacians and the Parthians.

▼ THE BATTLE OF THE TREBIA In 218BCE, Hannibal turned the Roman flanks by defeating their cavalry, then attacking from the rear.



"The **Romans** instil into their **soldiers fortitude** not only of **body** but also **soul**"

wars against the Numantines, in Spain, and against Jugurtha, King of Numidia, in North Africa. From 107BCE, the Roman general Marius instituted a number of reforms. The army became a permanent force, not recruited fresh each campaigning season, and it became open to all, rather than only the propertied classes. There was now just one form of heavy infantry, issued with standardized equipment—the *pilum*, the *gladius*, mail armor, and the *scutum*, a long rectangular shield. A more flexible tactical sub-unit—the cohort—also came into use. This consisted of 480 men, divided into six centuries (a unit of 80 men).

THE LEGIONS UNDER THE EMPIRE

The new army was supremely well drilled and disciplined. It could advance to within 50ft (15m) of the enemy and would then let off a volley of



JOSEPHUS, THE JEWISH WAR, c.75ce

javelins and charge. Once at close quarters, the legionaries used their shields to strike enemies, then stabbed them in the stomach with their short swords. Highly trained, they were able to withstand a cavalry charge by using their javelins to form a type of phalanx (see pp.24–25). They rarely lost field battles against infantry forces, and their skill in siege warfare meant that only mobile opponents with strategic depth, such as the horse archers of the Parthian Empire, were able to fend them off. With backup provided by professional auxiliaries—slingers, archers, and even specialized camel troops—armed with a wider range of weapons, the legions conquered much of Europe, North Africa, and the Middle East.

THE LATE ROMAN ARMY

Under the later empire, the Roman army became more diverse and was composed of smaller units. Smaller, oval or round shields were used instead of the *scutum* and lighter spears (*lancea*) replaced *pila*. Cataphracts (heavily armored cavalry) came into service, and the army became more adapted to defending the Empire's frontiers, rather than engaging in aggressive field battles. An increasing reliance on foreign mercenaries—mostly Germanic—meant that, by the fifth century, the Roman Empire's western provinces had few military resources of its own able to hold back waves of barbarian invaders—a factor that contributed to the empire's fall in 476CE.



ROMAN ARTILLERY

Roman legions carried field artillery with them. The bulk of these were ballistas—giant torsion operated machines that shot lead-tipped bolts.



key **events** 2600–750bce

■ 264–241BCE, 218–201BCE, 149–146BCE The Punic Wars between Rome and Carthage, in North Africa, end in a Roman victory. During the Second War, the Carthaginian general Hannibal crosses the Alps into Italy, defeating the Romans at Trebia and Cannae, but failing to capture Rome.

■ **102BCE** At the Battle of Aquae Sextiae, Roman general Marius defeats the invading Teutones, who threaten to overwhelm Italy. This is the reformed Roman army's first success.

58–50BCE Julius Caesar conquers Gaul, defeating numerous tribes and finally overcoming the resistance of the Gallic leader Vercingetorix at the decisive Siege of Alesia.

■ 27BCE Augustus becomes the first Roman emperor. After a long period of civil war, he reduces the number of legions from around 60 to 28, all of which now pledge their loyalty to the emperor rather than to a variety of generals.

■ 101–02, 105–06ce Emperor Trajan defeats the Dacian king Decebalus during the Dacian Wars. Dacia province becomes an outpost of the Roman Empire.

378ce Gothic barbarians defeat the main field army of the eastern Empire at the Battle of Adrianople. Emperor Valens perishes during the battle—Rome's worst military disaster for nearly 400 years.

◄ TRAJAN'S CAMPAIGN A scene from Emperor Trajan's campaign against the Dacians, in 105–06CE, shows the Romans fending off an attack from a field fortification.

ROMAN LEGIONARY'S ARMOR AND WEAPONS

The Roman legionary, the mainstay of the Roman army, fought in legions roughly 5,000 strong. Their equipment was well adapted for fighting in close formation, each soldier being equipped with two pila (javelins) that could be hurled, and a gladius (a short stabbing sword), which was used in hand-to-hand fighting. The dimensions of the equipment changed over time-a longer slashing sword, the spatha, came to be preferred over the gladius.



Overlapping scales

Broad

neck guard

Wide

cheekpiece

Shoulder

protection

Brow guard

◄ GALLIC HELMET

Date Late 1st century CE Origin Roman Empire Material Iron

This modern replica depicts an Imperial-Gallic helmet that was influenced by Celtic models and had a deeper neck guard than earlier Roman helmets, which made it harder to crouch and dictated a more upright fighting style for its wearers.

Bronze and leather attachments to hold metal plates together

▲ LORICA SQUAMATA

Date 1st century CE Origin Roman Empire Material Iron

Legionaries often wore armor of overlapping metal scales an inch long, made of copper or iron, bound together with iron and sewn onto a cloth underpiece. By the late 1st century CE, it was increasingly

superseded by lorica segmentata. G 0 Central boss deflected spear and sword thrusts **∢** SCUTUM Date 1st century CE Origin Roman Empire Weight 15–20lb (6.8–9kg) Width 29in (73cm)

The scutum (legionary shield) was a long rectangle that curved inward to form a part cylinder, giving greater protection to its wearer. As depicted on this modern replica, it was adorned with legionary insignia. When not in use, it was protected by a leather cover.

▲ LORICA SEGMENTATA

Date Late 1st century CE Origin Roman Empire Material Iron, bronze, leather

This modern replica Roman armor is made up of overlapping iron plates with leather straps running underneath. It probably had its origins in gladiatorial equipment and, although providing good protection, the complicated fittings made it hard to maintain.





HASTA

35



◄ GLADIUS AND SCABBARD

Date C.15CE Origin Rome

Length 22¹/2in (57.5cm)

Classically styled "hair

This gladius (legionary sword) and ornate scabbard was probably presented by the Emperor Tiberius to a favored officer. Its decoration shows the Emperor dedicating a victory to his stepfather Augustus.



▲ PUGIO

Date 1st century CE Origin Roman Empire Material Steel

The legionary's *pugio* (dagger) was a backup weapon if his sword could not be deployed. It was worn on the left for ordinary soldiers and frequently had an ornate scabbard inlaid with metal or enamel. The object shown here is a modern replica.



Soldiers were clean-shaven at this time

Legionary eagle standard in shrine

▲ MASK FOR CAVALRY SPORTS

Regimental

brand

Date 1st century BCE-1st century CE Origin Nola, Italy Material Bronze

At military displays, cavalrymen wore ornate helmets with face masks, often when they took part in mock battles. The mask was attached to the main part of the helmet with leather straps, and a crest and streamers added to the impressive appearance.



Date 3rd-1st centuries BCE
Origin Roman Empire
Weight 1 ¹ / ₄ -2 ¹ / ₄ oz (37.5-64.5g)
Length 1 ¹ / ₄ -1 ³ / ₄ in (3.2-4.4cm)

Roman armies included lighterarmed troops, whose weaponry included slings with lead pellets such as these. The legions also had some heavier artillery that shot larger, pointed bolts.

Waisted

blade



▶ PILUM AND HASTA

Date Late 1st century CE Origin Roman Empire Length 6¹/₂ft (2m)

The Roman military pilum (javelin) was a throwing weapon, designed so that its pointed head would break off on hitting a target, making it impossible to hurl back. The hasta (thrusting spear) was a more substantial spear, used to thrust in close-quarter combat. The versions shown here are modern replicas.

MAINZ-STYLE BLADE

POMPEII-STYLE BLADE

Parallel cutting edges

∢ GLADII

Date 1st-3rd centuries CE Origin Roman Empire Weight 25–32oz (700–900g) Length 26–28in (65–70cm)

Based on a short Spanish sword, the gladius had a narrow blade with a long point, making it effective for stabbing and thrusting. As can be seen in the modern replicas pictured here, the blade shape evolved from the waisted "Mainz" style to the straightedged "Pompeii" type, which then evolved into the longer, straightbladed spatha (slashing sword).

0 C

5 0

0

F

5

Ω

Ľ

0

S W

N D

HARIOTS

υ

кет **еvентя** |46все–|24се

c.146BCE Work begins on the Via Egnatia, a road that will enable Roman armies to access most of the Balkans from Italy.

■ **134–133BCE** Roman forces, led by Scipio Africanus, besiege the Celtiberian stronghold of Numantia, surrounding it with fortifications (known as circumvallations) and attacking it with siege towers. The settlement falls after 16 months.

52BCE Julius Caesar traps Vercingetorix, leader of the Gallic Revolt, at Alesia. Roman engineers build complex siege-works, preventing relief forces from coming to the defenders' aid.

73CE Flavius Silva uses his engineers of the Tenth Legion to subdue the mountain fort of Masada.

■ 122–24ce Hadrian's Wall becomes the Romans' most complex border system. It is 73 miles (117km) long and punctuated by forts.

▼ LEGION INSIGNIA

Imperial legions were proud of their identity. This plaque shows the emblem of the Twentieth Legion, which took part in suppressing the Iceni revolt in Britain (60–61CE).

KEY DEVELOPMENT

THE ENGINEERING OF ROMAN CONQUEST

The Roman legionaries were not only excellent in combat—they were also highly skilled military engineers, who were called upon to build forts, roads, and siege-works throughout the empire.

A Roman legionary's entrenching tools, it was said, were as dear to him as his sword. When on campaign, legionaries built a marching camp every evening, using a formulaic design that allowed them to organize encampments for up to 5,000 soldiers. Sited on level ground, the camps were usually rectangular, surrounded by a V-shaped ditch and an earth rampart bristling with wooden spikes that the legionaries carried with them.

Once an area was conquered, more permanent forts were built (see p.38), also based on this "playing-card design"—so-called because they had rounded corners. Each fort had four main gates, one of which (the *porta praetoria*) faced enemy territory; a network of roads; and a central block of buildings that contained the *praetorium* (commander's house), the *principia* (headquarters), and a shrine for the legionary standards.

Forts were built in various sizes, to accommodate either whole legions or smaller auxiliary cohorts (around 500 men). They sometimes formed part of complex linear defenses, or even walls (such as Hadrian's Wall in Britain). Over time, the earth and turf of many of the original forts were replaced with stone, and, during the later empire, the walls were stronger and had projecting corner towers allowing missile cross-fire. These developments reflected the fact that the forts had become places the army needed to defend, rather than bases from which to dominate the surrounding territory.

ROMAN SIEGES

The legionaries put their skill at constructing fortifications and ramparts to good offensive effect in siege warfare, as they encountered enemy bastions as diverse as the hill-forts of Gaul and Britain, and the elaborate walled towns of Judaea.

"There was also a tower made of the height of sixty cubits, and all over plated with iron, out of which the Romans threw darts and stones from the engines" If an enemy fort could not be taken by stealth, it had to be surrounded and starved out or, as a last resort, stormed. To isolate an enemy position, the Romans built complex siege-works of ramparts, often with towers from which to fire heavy catapults. At the Siege of Alesia, Julius Caesar oversaw the building of 35km (55 miles) of ramparts that hemmed in Gaulish chieftain Vercingetorix, and cut off supplies. Vast earthworks called assault ramps intimidated



the besieged troops, provided the attackers with access to the walls for artillery points, and formed a platform for a final assault.

More than the surviving remains of their forts, the finest testament to the Romans' skills in military engineering is arguably the vast network of roadssome 120,000km (75,000 miles) long-they built to consolidate their rule. The first was the Via Appia, begun in 331BCE, which initially ran from Rome to Capua. Main roads linked the towns, making it possible to move troops quickly and to operate an efficient postal network. Military roads ran behind important frontiers, as in Britain and Germany. Roman roads were normally straight, regardless of local topography, and were carried over rivers and marshes by bridges or viaducts. Their durability owed much to their excellent construction, which involved a foundation of coarse gravel laid beneath layers of finer gravel, with large blocks of basalt added on top to form the pavement.



▲ THE SIEGE OF MASADA

To take possession of the inaccessible mountain fort of Masada, the last stronghold of the Jewish Revolt, in 73CE, the Romans had to build a counterwall with towers and a gigantic assault ramp on which to mount a battering ram. The ramp was 738ft (225m) long and up to 656ft (200m) wide.



▲ A DACIAN CONQUEST Roman legionaries are depicted on Trajan's Column (in Rome, dated 113CE) leaving a fortress to cross the Danube on a bridge of boats at the start of Trajan's Dacian War, in 101–02CE.

key **figure** HADRIAN

76–138ce

The emperor Hadrian ordered a retreat from advanced Roman positions in Scotland and had a wall built to mark the Roman frontier in northern Britain. It was defended by a complex series of forts, milecastles, and turrets.



▲ Hadrian consolidated the Roman Empire rather than expanding it. He even withdrew from some territories.

ROMAN FORTIFICATION **ARBEIA FORT**

The Roman army built the ancient world's greatest fortifications. Legionaries were more like combat engineers than ordinary soldiers, being trained in construction as well as the art of battle.

On campaign, a legion made a wooden camp, surrounded by an earth rampart, at every stop. Permanent forts were initially also made of wood and earth, but later ones, like the reconstructed Arbeia, in northeast England, were stone-built. Used as barracks, administrative centers, and supply depots, they maintained a military presence in potentially hostile territory.

Outposts of Roman civilization, the forts made no concessions to local climates or cultures, displaying similar features across

the empire. Living conditions were basic and cramped—units of eight soldiers called *contubernia*, or "tent groups," shared small, two-roomed suites in the barracks. However, with heated bathhouses and latrines cleaned by running water, hygiene standards were relatively high.

Arbeia was a small fort, housing about 600 auxiliary troops, both infantry and cavalry. Built in the 2nd century CE, it was a major supply center for the troops on Hadrian's Wall to the north.



LAYOUT OF A ROMAN FORT

Large or small, most Roman forts were built to a similar plan, with barracks for cavalry and infantry, workshops, granaries, and a separate headquarters.

FORT ENTRANCE



▲ GATEHOUSE PLAQUE The plaque states that the fort was built by Legio VI Victrix under Sextus Calpurnius Agricola, governor of Britain (c.163–66ce).



▲ DOORS AND WALLS

Solid stone walls and thick wooden doors would have kept out the bands of tribal fighters who occasionally carried out raids in Roman Britain.

► GATEHOUSE

Although the twin towers of Arbeia's gatehouse are imposing, they are smaller than those at some other Roman forts and city walls.



C

CONTUBERNIA SUITE



▲ **BARRACK BLOCKS** Each plastered-stone block housed five *contubernia*. There were a few small windows, and ventilators were set into the roof.







The eight soldiers of a *contubernium* slept in the larger room of their suite, either under woolen blankets on simple beds or on strawfilled mattresses on the floor.

< SMALL ROOM

The smaller room of a *contubernium*'s suite was used as either a living area or a storage space for the soldiers' military equipment.



▲ INTERIOR BARRACK WALLS The internal walls were made of wattle-and-daub—a woven wooden lattice (wattle) daubed with a mixture of straw, mud, and animal dung.

OFFICER'S HOUSE

▲ **BATHHOUSE LATRINES** There was also probably a bathhouse for the troops outside the fort. Its communal latrines lacked privacy, but they had high-quality plumbing.



▲ **COURTYARD** The commanding officer lived in a comfortable house within the fort. It had an open courtyard and rooms leading off a colonnaded walkway.



39

ENEMIES OF ROME

The expansion of Rome's influence from a small settlement in central Italy to an imperial power that ruled a huge empire brought its armies face to face with a wide range of foes. Although the individual equipment of most enemy warriors may have been superb, their training and organization was almost always inferior to that of the Roman army. However, the Roman infantry did struggle against the mounted warriors of Persia and the Hunnish archers, and by the time the Franks, the Ostrogoths, and other Germanic groups poured into the empire from the 4th century CE onward, the Roman army was too weakened to resist them.

Bronze wings

V BRONZE SAMNITE BREASTPLATE Date 4th century BCE Origin Central Italy Material Bronze

Made of three convex bronze disks, this breastplate would have been matched by a similar piece to protect the back. Such armor was worn by Rome's opponents, the Samnite tribes, in three wars in central Italy from 343–290BCE.



40

Repoussé (hammered relief) decoration

. Carefully worked

bronze rivets

Bow recurves toward archer

Handle

reinforced

with bone

▲ BRONZE HELMET

- Date 250–50BCE Origin England Material Bronze
- This horned helmet is the only one of its type ever found in Europe, and was probably for ceremonial rather than combat purposes. It is made of bronze sheets riveted together.

► HUNNISH BOW

 Date
 5th century CE

 Origin
 Central Europe

 Length
 4–5¹/rft (1.25–1.65m)

The Huns employed compound bows made of horn and wood, which had a greater range than simple bows. The Huns depended on a rapid rate of fire from horseback for their military successes against the Romans in the 5th century CE. The version pictured here is a modern replica.

▼ SASSANIAN PERSIAN SWORD

Date 6th–7th century CE Origin Persia Length 3¹/₂ft (1.05m)

Late Sassanian Persian swords were long with narrow blades. They were hung from the belt by two straps, which prevented the scabbard from trailing on the ground and allowed the rapid drawing of the sword.

▼ FRANCISCA THROWING AX Date 500–600ce Origin Europe Weight 15¹/40z (430g)

Length 6¹/2in (16.5cm)

francisca was commonly used by the Franks—a Germanic group who fought against the Romans from the mid-4th century CE, and who had conquered most of Gaul by the end of the 5th century CE.

A light throwing ax, the

ed by



This eagle clasp was probably used to fasten the cloak of a high-status warrior. It comes from the Ostrogoths, a people who occupied Italy from the late 5th century CE. 41

Characteristic concave-shaped iron head

KEY BATTLE THE BATTLE OF THE RED CLIFFS 208ce

The Battle of the Red Cliffs marked the culmination of the struggle between the northern Chinese warlord Cao Cao and his southern rival Sun Quan. Although Cao Cao lost, his fleet destroyed by fire, he escaped and continued to rule the northern kingdom of Wei.



▲ The warlord Cao Cao arrives by barge on the eve of the Battle of the Red Cliffs.

ASIAN TRADITIONS

Asian societies, in particular India and China, had their own distinctive military traditions. From the 6th century BCE onward, large states began to appear in these areas that were able to deploy massive armies. In both China and India, however, these armies struggled to subdue nomads from Central Asia.

From the earliest times, China was the backdrop for fierce disputes between warring factions. The royal workshops of the Shang, the first historic Chinese Dynasty (1766–1122BCE), produced bronze dagger-axes, arrowheads, helmets, and shields, and early chronicles record battles against an enemy from the north called the "Tufang," with forces that numbered up to 5,000. Army sizes increased under the succeeding Western Zhou dynasty, but it was not until a period of political fragmentation known as the Spring and Autumn period (776–403BCE) that more organized military activity began.

Spring and Autumn armies combined chariots, ridden by noble warriors armed with bows, with infantry who fought with lances. This era gave way to the Warring States period (403–221BCE), a time of incessant warfare between rival powers such as Zhao, Qi, and Qin. As armies of up to 100,000 men fought in the battles between rulers, a shift occurred in favor of infantry-based armies, while traditional weapons such as the lance (*mao*) and dagger-ax (*ge*) became

longer, making them more effective when used by large numbers of troops. The crossbow appeared, adding range to the armies' destructive power, while military organization also became more sophisticated, with the publication of the first work on military strategy, by Sunzi, in around 500BCE. After China became united under the Qin in 221BCE, its successor dynasty, the Han, was able to call on even greater military resources, with a war tax and a pool of recruits of up to a million enabling campaigns deep into Central Asia and as far afield as Vietnam (in 111BCE).

STRUGGLES IN INDIA

▲ ELEPHANTS AT WAR

War elephants are first mentioned in the Mahabharata around 1000BCE, and their use was subsequently adopted by Alexander the Great. Many other armies, such as Hannibal's Carthaginians, also employed them. The earliest archaeological indications of warfare in India come from the Indus Valley civilization, where arrowheads and flat axes have been found in the ruined city of Mohenjo-Daro, dating toward the end of the 3rd millennium BCE. The India depicted in the Vedic poems (around 1500–1000BCE) had a similar aristocratic tradition to that of China, in which chariot-mounted nobles armed with bows were the most important military force.By the time of the era described in the epic poems, such as the Mahabharata (around 900BCE), warfare had become more varied, with larger numbers of infantry and the first appearance of swords. As early states coalesced after 600BCE, more realistic historical records begin to emerge, recounting, for example, the wars of Bimbisara and Ajatashastru of Maghada: in their struggle against the Vriji confederacy they are said to



42

0 C

5 0

T 0

S

Ω

Ľ

0

S W

AND

CHARIOTS

have used large catapults to hurl rocks, as well as the *rathamusala*, a chariot fitted with a mace that scythed through the enemy's ranks. From the early 5th century BCE, the empire-building Nanda dynasty could deploy armies consisting of 20,000 cavalry and 200,000 chariots, as well as 3,000 war elephants, which the Greeks encountered for the first time when Alexander the Great's army invaded India in 327BCE.

HORSEBACK RAIDERS

From the 2nd century BCE, Indian dynasties lost territory in the north of the country to Central Asian nomadic groups such as the Yuezhi, and later the Sakas and Hunas. Horse-mounted bowmen, these warriors could travel rapidly, enabling them to carry out successful campaigns of harassment against Indian forces of greater number. The established Asian powers, with their more conventional military tactics, found these offensives difficult to repel. In China, the Han engaged in a long-running struggle against the nomadic Xiongnu people to the northwest, who several times during the 2nd century BCE seized control of the strategic Tarim Basin. They and many other tribes continued to plague the Chinese along the whole frontier of their empire well into the 5th century CE.

"Let your rapidity be that of **the wind**, your compactness that of **the forest**. In raiding and plundering, **be like fire**"



SUNZI, THE ART OF WAR, 500CE



▲ TERRACOTTA ARCHER Often aristocratic warriors, archers formed the elite of Chinese armies, until the rise of elite infantry and weapons such as the crossbow, which occurred during the Warring States period (403–221BCE).

▲ EPIC BATTLE

A scene from the Mahabharata, an ancient Indian epic recounting a struggle between two armies over the Delhi area that ended in an 18-day battle.

KEY EVENTS

2600-100bce

c.1000BCE The legendary Mahabharata War between the Kauravas and Pandavas is the first conflict described in Indian history.

■ 221BCE After a long series of wars, the Qin kingdom under Qin Shih Huangdi conquers the last of the other Warring States, making China a unified country ruled by an emperor for the first time.

■ 261BCE Mauryan forces kill around 100,000 Kalingan soldiers in a bloody battle during the conquest of Kalinga (in modern Orissa, India). The victorious Mauryan ruler, Ashoka, renounces war and turns to the non-violent creed of Buddhism.

■ 202BCE At the Battle of Gaixia, the Chinese Han army under Liu Bang traps the rival Chu force under Xiang Yu in a canyon, killing most of them. Soon after, Chu surrenders, and Liu Bang becomes the first Han emperor.

■ 127BCE General Wei Qing invades the Xiongnu lands north of the Chinese frontier, beginning a Han–Xiongnu war that carries on intermittently until 89CE. 43

SIAN

TRADITION

TERRACOTTA WARRIORS The life-size figures in the Terracotta Army were assembled from arms, legs, heads, and torsos that had been mass-produced separately. Each figure was then given individual facial features to create a realistic impression of a living army.



AN ANCIENT CHINESE ARMY

TERRACOTTA WARRIORS

Discovered near Mount Li in Shaanxi Province in 1974, the buried collection of sculptures known as the Terracotta Army opens a unique window on China's military past, providing a realistic representation of an army in the reign of self-styled "First Emperor" Qin Shi Huang over 2,000 years ago.

A towering figure in Chinese history, Qin Shi Huang unified all of China under his rule in 221 BCE, crushing his rivals by the relentless application of military power. As emperor he centralized power, suppressed dissent, and launched large-scale construction projects, including the first attempt to build a Great Wall to block the incursions of steppe nomads. The Terracotta Army was created as part of the emperor's burial complex: it comprises over 8,000 soldiers, 150 cavalry horses, and 130 chariots, each pulled by four horses.

The great majority of the army represented in these sculptures consists of peasant foot soldiers. They are depicted with armor of laced plates (the originals would have been made of bronze or hardened leather), and though helmets are not shown on the figures, archaeological finds of armor include them. The figures were also equipped with real weapons, fragments of which remain. Other sources reveal that infantrymen were equipped with a variety of axes and swords made of bronze, and with staff weapons, most typically the "daggeraxe." This was a long spear with a sharp blade attached to the haft, which could be used to stab in a prodding motion or wielded like a scythe. Many of the men also carried crossbows, a fundamental weapon in Chinese warfare: crossbows with sophisticated bronze trigger mechanisms were found during the excavation of the Terracotta Army.

Cavalry was a recent innovation that had helped Qin Shi Huang achieve his military ascendancy. With no native tradition of horsemanship, the Chinese had learned the importance

of mounted troops from their wars with steppe nomads; some of the horsemen would have been armed with varieties of bows. The chariots represented a Western influence on Chinese armies; by this period, rather than being used as a shock force, on the battlefield they chiefly functioned as mobile command platforms for aristocrats and senior officers, kept to the rear of the fighting troops. Indeed, officers in the Terracotta Army are portrayed as taller than ordinary soldiers, and are also identifiable by their long double tunics and more elaborate armor.

SERRIED RANKS

The arrangement of the Terracotta Army in ordered ranks suggests a body of disciplined soldiers drilled to march in step. According to ancient texts, armies numbering hundreds of thousands of men were fielded in the largest Chinese battles. Even allowing for exaggeration, the massed peasant forces must have been large and difficult to command. Banners were used to signal messages across the battlefield, drums marked an advance, and bells were sounded to order a retreat. Crossbows were probably deployed in mass formations, with soldiers shooting volleys in sequence, one group loosing their bolts while another reloaded. An exchange of missiles at distance was probably more to the taste of poorly motivated peasant conscripts than close-quarters combat. The emphasis in ancient military writings on deception, rather than pitched battles, may well reflect the difficulty of executing decisive battlefield maneuvers with unwieldy forces.





INTRODUCTION

During the era known in Europe as the Middle Ages, warfare was dominated by the mounted warrior—from the armored European knight to the steppe horseman. Military technology evolved slowly, and for a long time the bow was more influential than new gunpowder weapons.

Centers of settled civilization were often vulnerable to raids or conquest by marauding warrior tribes: despite being relatively advanced in terms of both technology and its government, China was conquered in the 1200s by the Mongols—steppe nomads using the composite bow. Religious zeal also proved as important as technological advantages: the foundation of Islam in around 600CE inspired an Arab expansionist drive, while from around 1090, militant Christianity inspired crusades to Palestine and the retaking of Spain from Muslim rule. These insecure times saw the building of castles and other fortifications, which then became the object of attack by siege engines. During this period, developments in metallurgy improved the quality of the steel used for swords and armor. In western Europe, the mounted knight, clad in increasingly complex armor, became a central figure in the culture of chivalry, as well as a highly effective fighting man.

European warfare also repeatedly demonstrated the effectiveness of disciplined foot soldiers—from the Genoese crossbowmen, to the longbowmen of the English kings, to the Swiss with their pikes. The use of gunpowder also crept into warfare during this era—initially as a peripheral novelty, valued more for its surprise effect of flashes and bangs than for its practical impact. In 15th-century Europe, however, improvements in the construction of metal cannon, and in the quality of gunpowder, created the potential for a transformation in siege warfare and fortifications. Large guns had made the tall, stone walls of the medieval castle obsolete by 1500, but it would take considerably longer for the armored knight to disappear from the battlefield.

KEY DATES



