

EYEWITNESS  GUIDES

ARMS & ARMOUR



Silver-hilted
robe sword,
c. 1710



Flintlock pocket
pistol, c. 1770



Pinfire revolver,
c. 1860

EYEWITNESS  GUIDES



Cartridges,
c. 1850

Rapier, c. 1625

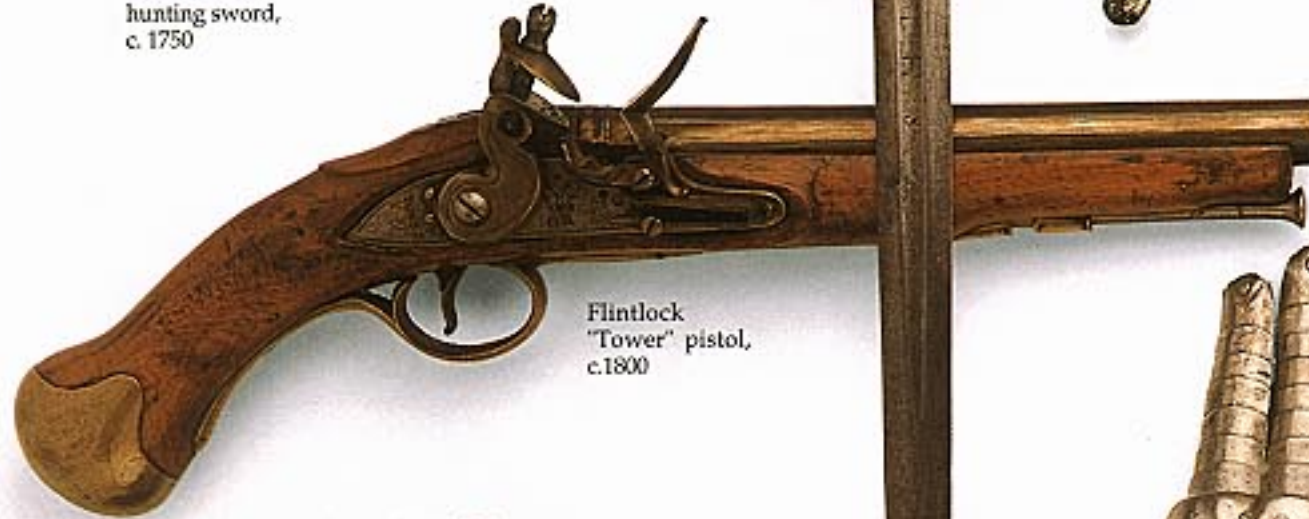


ARMS & ARMOUR

Silver-hilted
hunting sword,
c. 1750



Written by
MICHELE BYAM



Flintlock
"Tower" pistol,
c. 1800

Indian knife
with jade hilt,
c. 1800



Bullet mould, c. 1850

Bullets,
c. 1850



Pepperbox revolver,
c. 1855



Howdah pistol,
c. 1850



Powder flask, c. 1850



Medieval dagger, c. 1400

Belgian crossbow,
c. 1830



Three
Indian arrows,
c. 1800



Gauntlet, c. 1580

German war hammer, c. 1600




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Niam Niam, a ceremonial knife from Sudan



Copper dagger of the Kasai people in West Africa



Maratha "crow-bill" war pick from northern India



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This Eyewitness® Guide has been conceived by Dorling Kindersley Limited and Editions Gallimard

First published in Great Britain in 1988 by Dorling Kindersley Limited, 9 Henrietta Street, London WC2E 8PS

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British Library Cataloguing in Publication Data
Arms & Armour. - (Eyewitness).
I. Arms and armour - History - Juvenile literature
I. Series
623.4'09 U800

ISBN 0-86318-271-2

Colour reproduction by Colourscan, Singapore
Typeset by Windsor Graphics, Ringwood, Hampshire
Printed in Singapore by Toppan Printing Co. (S) Pte Ltd.



Chinese sword in wooden sheath, clad in tortoiseshell with brass mounts

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Spiked iron bracelet from eastern Sudan



Buffalo horn knuckleduster from southern India



Tiger claw from northern India

Prehistoric weapons



IN ORDER TO HUNT, attack others, or defend themselves, people have always used weapons. In the Early Palaeolithic or Old Stone Age, the tiny, scattered communities used weapons mainly for hunting. Early people discovered that if they chipped hard stones such as flint into a pointed shape they could be used for killing and skinning animals.

Thousands of years later, in the Upper Palaeolithic or Later Stone Age, weapons were revolutionized by the invention of the handle or haft. By lashing a handle onto an axehead, or spearhead, prehistoric man found that his hunting and attacking weapons became both more reliable and stronger.



The illustration (above) shows how hand-axes were probably held



BREAKING OFF A FLINT FLAKE
The first stage of preparing a flint tool or weapon was to break off a large flint flake with a hammer-stone.



STRIKING OFF CHIPS
After the hammer-stone had made a rough shape, the remaining core was fashioned into a tool or weapon with a wooden or bone hammer.



PRESSURE FLAKING
A more refined method of working a weapon or tool to a desired shape was by using a bone, stone or wooden implement to pare the flint's surface.



TWO PALAEO-LITHIC HAND-AXES, c. 300,000 - 200,000 B.C. These axes or chopping tools, made by an ancestor of modern man known as *homo erectus*, are hardly recognizable as tools or weapons.



CRUDE PALAEO-LITHIC HAND-AXE, 250,000-70,000 B.C. Although made during the same period in pre-history as the axe above right, this weapon or tool shows far less workmanship.



DEER HUNTING
An old engraving shows a New Stone Age hunter killing a deer with a flint axe, fastened to a wooden handle.

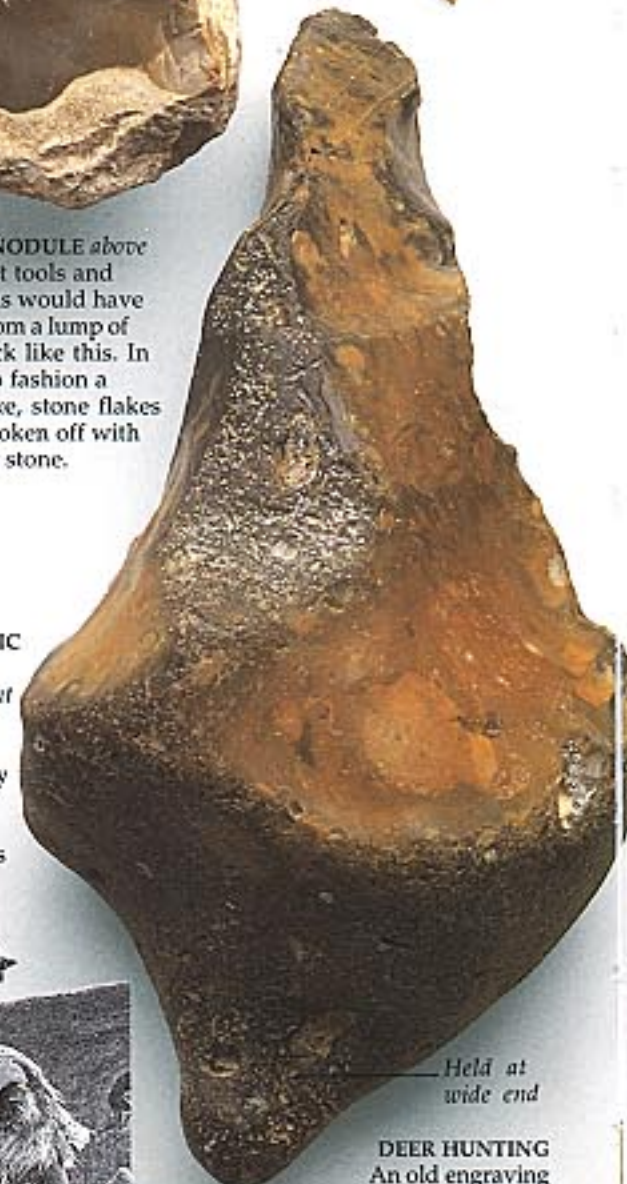


Held at wide end



Flint flakes

FLINT NODULE above
The first tools and weapons would have come from a lump of flint rock like this. In order to fashion a hand-axe, stone flakes were broken off with another stone.



A STONE AGE MAMMOTH HUNT
Hunters in the Old Stone Age needed both bravery and guile to trap and kill large animals. Having been driven into a pit, this woolly mammoth, an extinct type of elephant, is being battered to death with rocks. The spears sticking into the mammoth's sides would have been made of sharpened wood.



Rough cutting edge

TWO SHAPED PALAEO-LITHIC HAND-AXES, c. 250,000-70,000 B.C. left and below
Hand-axes were certainly used by Palaeolithic people as weapons when hunting animals, but it is purely conjecture whether an axe like this was ever used as a battle-axe in warfare.

MIDDLE PALAEO-LITHIC HAND-AXES, c. 80,000-40,000 B.C. right
Of a similar date, these two hand-axes were made by a type of early people known as Neanderthal man.



A cave painting of bowmen, painted between 12,000 and 3,000 B.C., found at Cueva Remigia, Spain (above)

Spearhead tip

SPEARHEAD, c. 20,000 B.C.
By the time this possible spearhead was made by *homo sapiens sapiens* or modern man, handles had been invented, thus revolutionizing weapons and tools.



STONE AGE HUNTERS
Cave paintings found in European countries such as Spain and France either show hunters or the animals they killed.



Missile weapons

ANYONE WHO HAS EVER thrown a stick or a stone, fired a catapult, or shot an arrow from a bow has used a missile weapon. Indeed, such weapons have been used for both hunting and fighting since prehistoric times. More unusual missile weapons include the boomerang, traditional weapon of the Australian Aborigine, and the curiously shaped throwing weapons used by the tribespeople of Central and West Africa. The simplicity of these weapons is deceptive for when used by skilled throwers they are just as effective as more complex hand weapons.



THROWING A BOOMERANG
When used by a skilled thrower, such as this Australian Aborigine, a boomerang can be sent great distances.

PARRYING STICK above
Sticks are defensive rather than offensive weapons. This Aborigine parrying stick deflects missile weapons such as spears and boomerangs.

THROWING CLUB above right
An Aborigine aiming this wooden throwing club would have aimed to stun his victim with the weapon's pointed end. Some of the wooden war clubs used by Pacific Islanders and African tribesmen are also used as missile weapons.

ABORIGINES HUNTING
Australian Aborigines are peaceful people who rarely use their weapons for fighting. In this 19th-century painting a group of Aborigines are hunting game with hand clubs, shields and multi-tipped fishing spears.



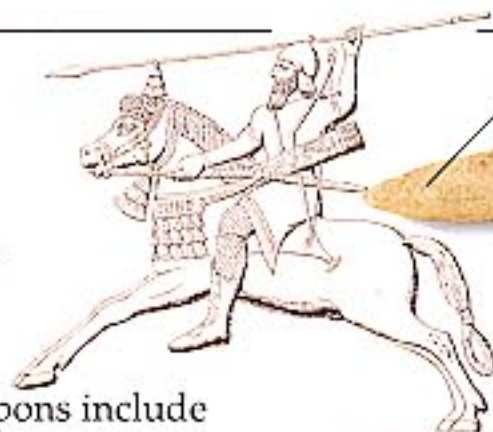
FIGHTING BOOMERANG left
The large wooden boomerangs used by Aborigines in war are designed to fly straight and do not return to their throwers even if they miss their targets.

Flat piece of hard wood

Grip

Flatter on one side than the other

Striking edge



ASSYRIAN HORSEMAN
In this Assyrian relief a horseman carries a lance, a sword, and a bow with arrows.

Stone arrowhead

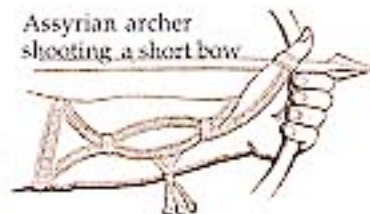
ABORIGINE SPEAR above
Made of stone or bone, the heads of Aborigine throwing-spears are made in much the same way as spears used by Stone Age hunters (p. 7).

Protective arrow sheath

Poisoned tip

SHORT BOW
Although bows are popular all over the world only a few tribespeople make poisoned arrows. This bow and poisoned arrow come from West Africa.

Assyrian archer shooting a short bow



Persian king using a bow and arrow



Striking edge

THROWING KNIFE
Among the most unusual-looking weapons are African throwing knives. A multi-bladed weapon always has a better than average chance of striking its target.

Short handle

THROWING AXES
Although steel throwing axes were only popular in Europe during the Middle Ages, they have always been used by certain African tribes. Both these throwing axes were made in West Africa, c. 1900.

THE STAFF SLING below
Slings were used by European armies until the 16th century when they were used to hurl grenades. The staff sling, a shaft with a leather sling fixed to one end, could hurl stones with tremendous force.



Holding a sling (above)



A medieval slinger releasing his sling (left)



The first warriors



THE DISCOVERY OF METALS such as copper and bronze, first used in south-west Europe about six thousand years ago, revolutionized the making of both tools and weapons. In the early part of the Bronze Age, axes and spears were still tanged - bound to a handle or haft by leather strips or string - but by the end of the Bronze Age, weapons were more firmly secured to handles by sockets. In the 6th and 5th century B.C., Celtic tribesmen began to make iron as well as bronze tools and weapons. The richly ornamental culture which the migrating Celts spread across Europe at the beginning of the Iron Age, is well-illustrated by their finely crafted weapons.

HALBERD BLADE, c. 2300-1600 B.C. *below*
Made either in Ireland or on the European mainland, this copper halberd, could be used either for cutting or chopping, thus combining the uses of a battle-axe and a spear.

FLINT ARROWHEADS, c. 2700-1800 B.C. *above*
Bows and arrows were used for the first time during the Mesolithic Age (Middle Stone Age). About 2500 B.C. these "barbed and tanged" arrowheads were used for hunting or warfare.

Celtic warrior, c. 450 B.C., carrying a sword and spear



Three flint arrowheads

Tang

Barb



BRONZE SPEARHEAD, c. 900-500 B.C. *above*
Crude spears were first used in the New Stone Age (pp. 6-7). By the Bronze Age, spearheads like this were made by skilled bronze-smiths.

A fragmentary ingot of copper or bronze, used for making weapons or tools



Socket for insertion of handle



Loop through which a cord tied axehead to haft



THREE BRONZE AXEHEADS, c. 750-650 B.C.

By the Late European Bronze Age, bronze-smiths had learned to make socketed axes into which wooden hafts were inserted. Axes were used for warfare or woodworking.

BRONZE SWORD POMMELS AND HILTS
The fine engraving on these swords show the craftsmanship of Late Bronze Age bronze-smiths. Weapons such as these would have belonged to chieftains.



Double-edged blade

BRONZE AGE SWORD, c. 900-800 B.C.
This gracefully shaped, Late Bronze Age sword was designed as a slashing weapon.

Grip would have had wood, bone or horn plates, riveted either side, and wrapped round with leather

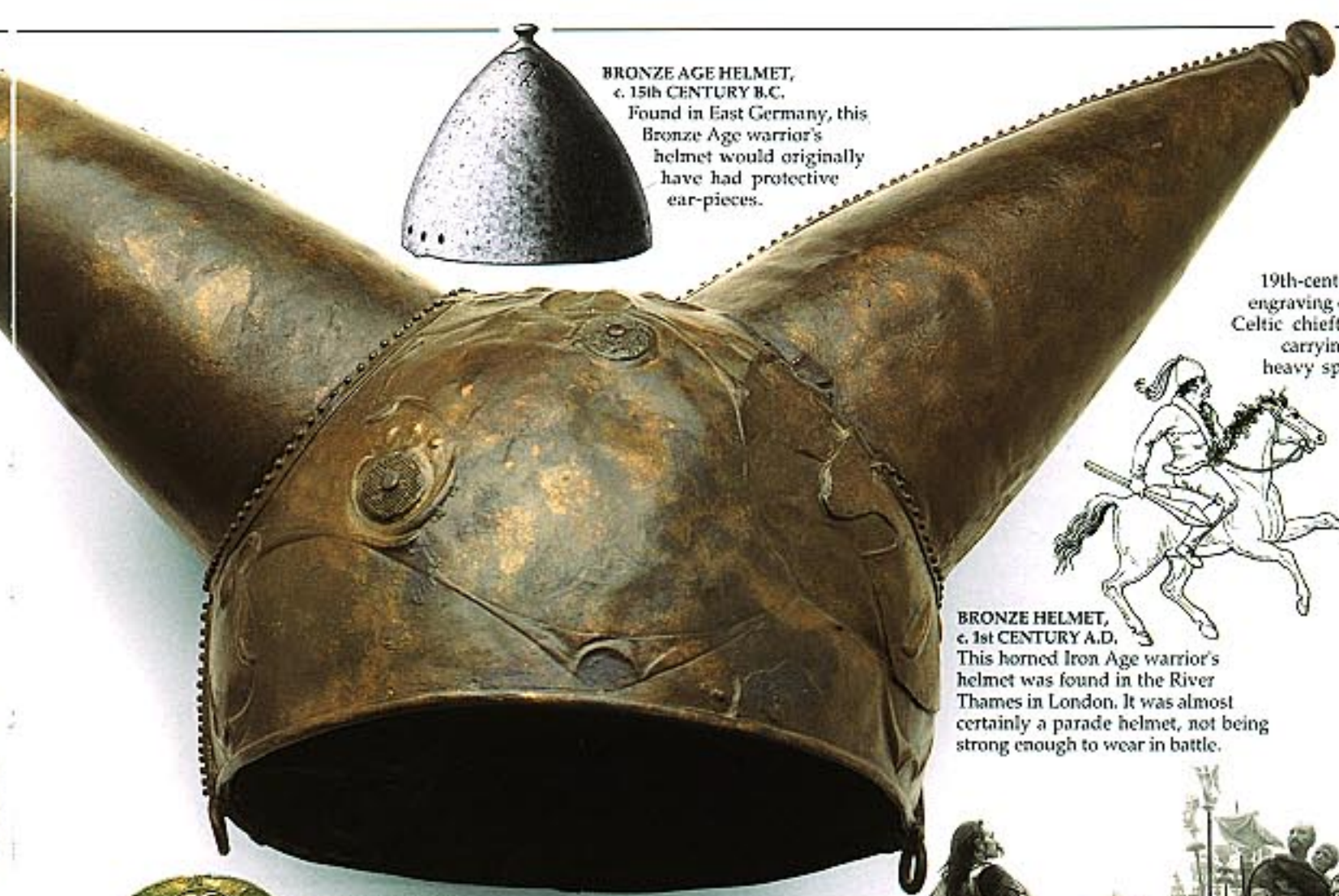


Long wooden handle

Double-edged blade



BRONZE AGE HELMET, c. 15th CENTURY B.C.
Found in East Germany, this Bronze Age warrior's helmet would originally have had protective ear-pieces.



19th-century engraving of a Celtic chieftain carrying a heavy spear



BRONZE HELMET, c. 1st CENTURY A.D.
This horned Iron Age warrior's helmet was found in the River Thames in London. It was almost certainly a parade helmet, not being strong enough to wear in battle.



IRON AGE SHIELD, c. 200-100 B.C. *left*
Recovered from the River Thames, this beautifully decorated shield was probably for ceremonial use rather than warfare. The bronze sheet originally had a wood backing, and the shield's inserts are coloured glass studs.

"VERCINGETORIX BEFORE CAESAR" *right*
The leader of the Gauls in their revolt against Roman rule, Vercingetorix was captured by Julius Caesar in 52 B.C. In this painting, the Celtic weapons on the ground include a shield, helmet and sword.



IRON AGE DAGGER IN SHEATH, c. 550 B.C.
This early British iron dagger would have belonged to a tribal chief. The bronze sheath would have hung from his belt by iron loops.

Guard

Wood lining wrapped around with bronze strips

EARLY BRONZE AGE DAGGERS
Central European tribesmen used these daggers for fighting at close quarters.



Dagger tip



A Roman standard bearer wearing a gladius

A Roman legionary

THE TWO GREATEST ARMIES of ancient times were the Macedonian army under Alexander the Great and the Roman army. From 334 to 326 B.C., Macedonia, a small Greek state, had a superb army built around the phalanx - solid lines of spear-carrying infantry. The basis of the Roman army was the legion - units of infantry with supporting cavalry. Between 800 B.C. and A.D. 200 it was the Roman army's continuing response to enemy weapons and to changes in available materials, coupled with good discipline and an efficient organizational ability, which brought Rome to its pre-eminent position as ruler of the ancient world. The armour and weapons shown on these pages are accurate replicas of equipment carried by the Roman legions.

A Greek hoplite

A Greek foot soldier or hoplite's equipment included a metal helmet, a leather or mail breastplate, a metal shield and leg armour. He carried a thrusting spear and a short sword.



GREEK VASE
Much of our knowledge of ancient Greek arms and armour comes from decorations on contemporary vases. Here, the Greek hero Achilles is shown killing Penthesilea. Painted about 540 B.C., the two figures depicted give a good idea of the helmet styles and body armour of the period.

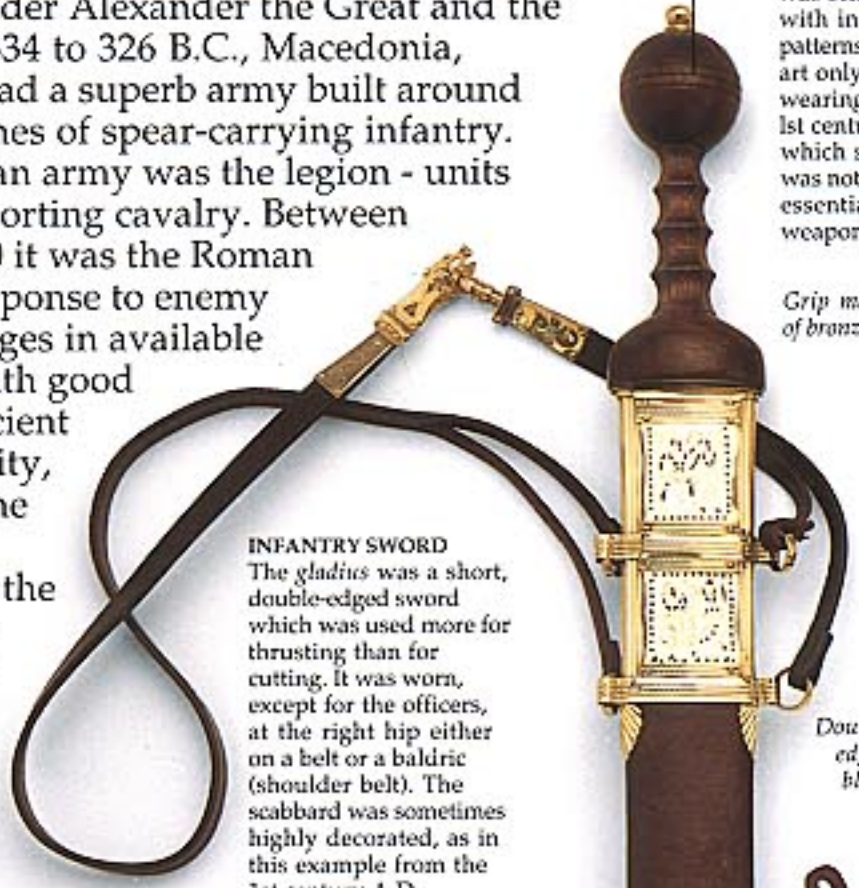


CORINTHIAN HELMET
The Corinthian-type Greek helmet, first made in the 8th century B.C., reached the elegant shape shown here in the 7th century B.C. Only the eyes and mouth were uncovered, providing almost complete protection. When not fighting the soldier often wore his helmet on top of his head for comfort.

SCENE FROM THE ILIAD
A Victorian depiction of soldiers from the Greek epic poem the Iliad. Written in the 8th century B.C. and attributed to Homer, the poem tells of events in the final year of the mythological Trojan War. The warriors are in fact wearing Roman-style bronze breastplates and helmets.

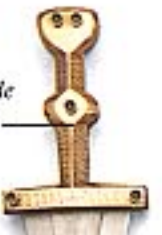


Gladus handle made of wood or bone



MILITARY DAGGER
Soldiers carried a short dagger called a pugio on the belt at their left hip. Its iron scabbard was often decorated with inlaid enamel patterns. Roman works of art only depict soldiers wearing a pugio in the 1st centuries B.C. to A.D., which suggests that it was not considered an essential weapon.

Grip made of bronze



Double-edged blade



Iron scabbard with loops for attachment to belt

Long iron point



Broad cheekpieces hinged to side of helmet and tied under chin with straps or cords

THROWING SPEARS left
The head of the hasta (right) is a familiar shape for a spear, but the long head of the pila (left) was designed to pierce a shield and then continue on into the soldier behind it.

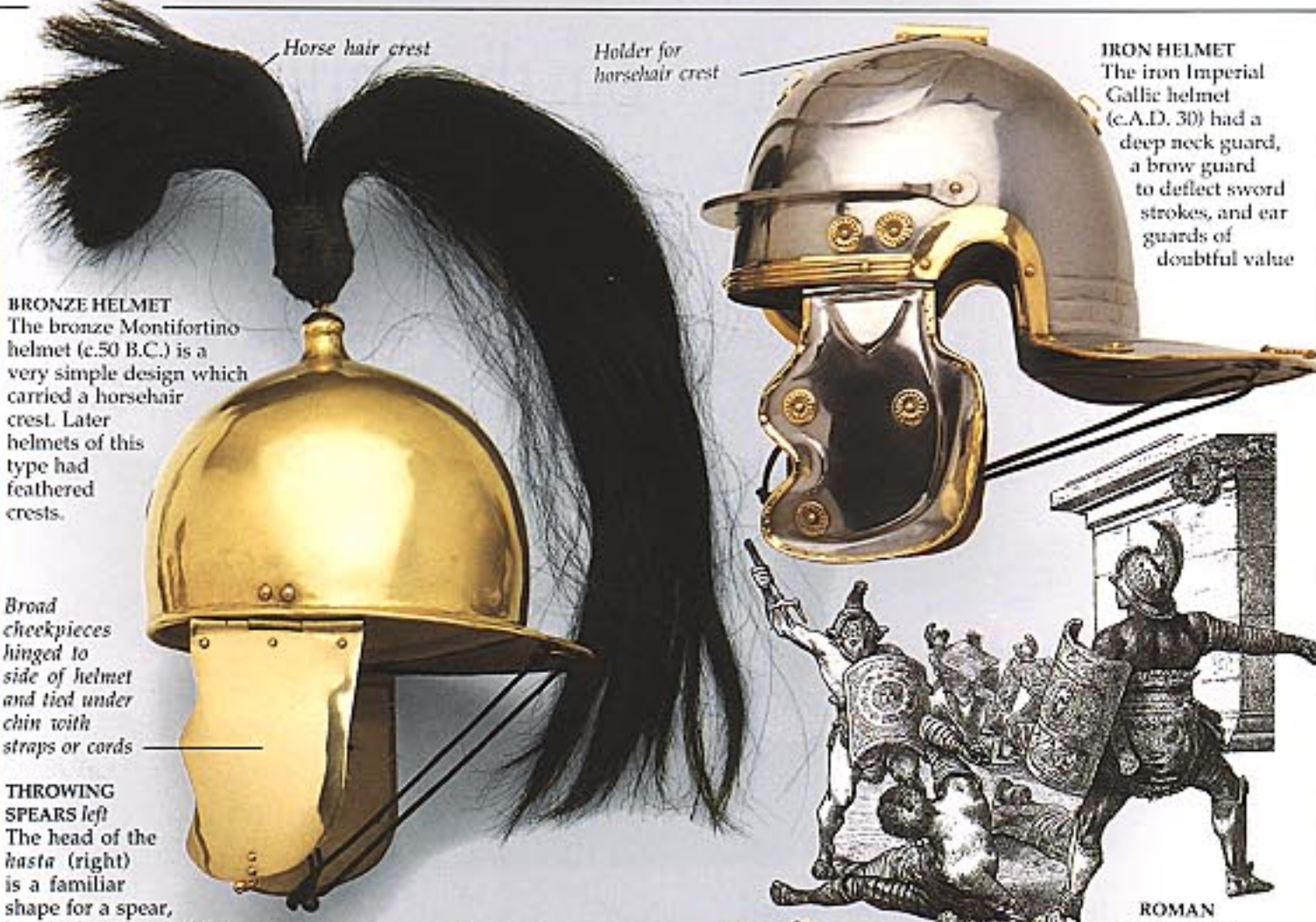
Armour laced together at the front and upper part of armour hooked to lower part by bronze hooks

BODY ARMOUR
Made of iron strips, the lorica segmentata, an early cuirass (p. 26), was worn from early in the 1st century A.D. until the 3rd century. It partially replaced the earlier chain mail and scale armour. The strips were held together by leather straps on the inside and the armour had many bronze fittings.

Long haft made of ash



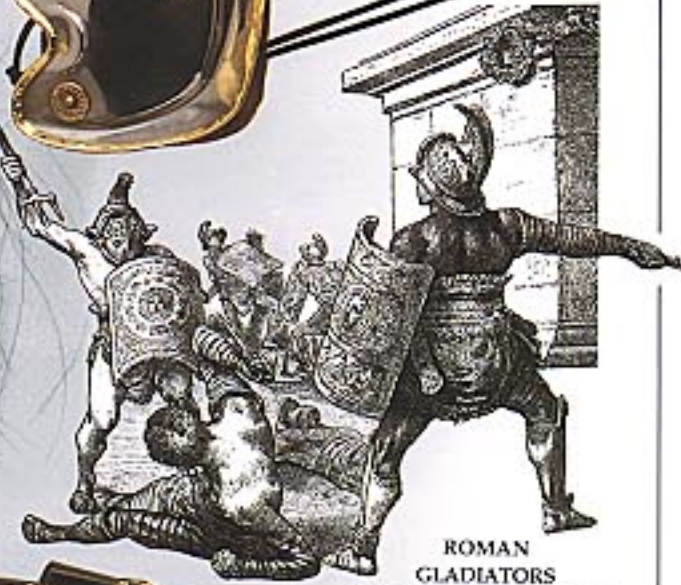
BRONZE HELMET
The bronze Montefortino helmet (c.50 B.C.) is a very simple design which carried a horsehair crest. Later helmets of this type had feathered crests.



Holder for horsehair crest

Horse hair crest

IRON HELMET
The iron Imperial Gallic helmet (c.A.D. 30) had a deep neck guard, a brow guard to deflect sword strokes, and ear guards of doubtful value



ROMAN GLADIATORS
Although their style was more flamboyant than that of the Roman army, gladiators often led the way in new weapon designs such as lighter rectangular shields.

Victorian depiction of Roman legionaries



Weapons from the Dark Ages



THE DARK AGES WAS THE PERIOD in European history, between the 400s and 900s, when Germanic and Scandinavian tribesmen - Saxons and Norsemen or Vikings - raided and settled in the Low Countries, England, France, and Spain. Our knowledge of this period comes not only from surviving weapons and equipment, but from textiles such as the Bayeux tapestry, woven to celebrate the invasion of England by the Normans (Norsemen) of north-west France.



THE NORMANS ATTACK THE ENGLISH
A valuable document on the weapons of the Norman period, the Bayeux tapestry is a strip of embroidered linen that chronicles the Norman invasion of England in 1066.

SWORD GUARD, c. 1040
Made of metal, ivory, bone or horn, sword guards were often inlaid with precious metals.



ANGLO-SAXON SWORD, c. 500-600 above
Swords were only used by Saxons of high rank, such as the king (above), shown with his shield bearer. He is wearing a chain mail shirt.

Missing grip would have been made of wood, and possibly covered with leather, bone or horn



Shallow fuller (groove) lightens weight of blade

VIKING SWORD, c. 900-1000 below
A Viking's favourite weapon was his sword. Used for slashing rather than thrusting at an enemy, swords were carried in decorated scabbards.

Grips, made of metal, horn, wood or bone, were sometimes covered in leather



VIKING SWORD BLADE above
Made by skilled craftsmen, Viking sword blades were double edged with slightly blunted tips.

Original shaft probably made of ash



SHORT SPEAR, c. 400-500 above
Short-headed Saxon spears were used both for stabbing and throwing.

Iron head



LONG SPEAR, c. 400-500 above
Long-headed Saxon spears were used by or against cavalry.

VIKING GOD
As Tyr, a god of war, was believed to give victory in battle, Viking swords were often marked with the letter T.

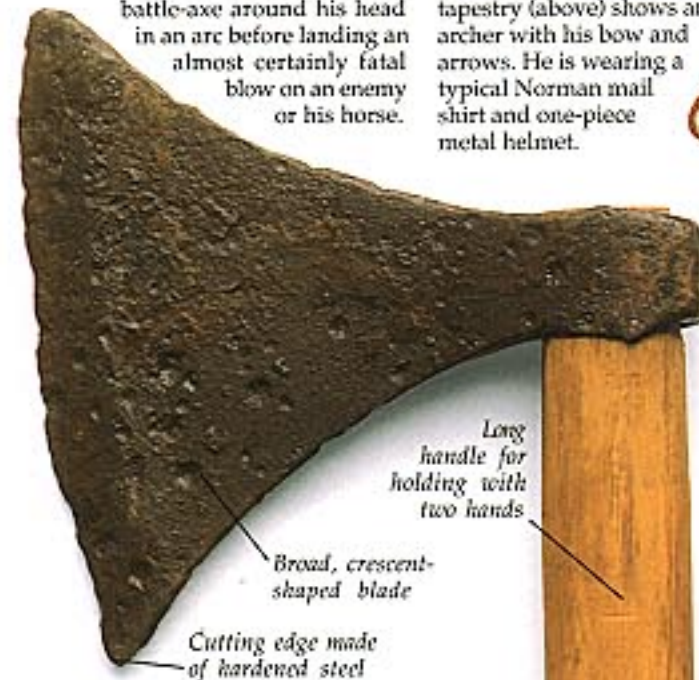


ANGLO-SAXON HELMET, c. 600
Although recovered from a Saxon burial ground, this helmet resembles those worn by the Vikings.



VIKING AXE, c. 900-1000
A Viking warrior swung his battle-axe around his head in an arc before landing an almost certainly fatal blow on an enemy or his horse.

NORMAN ARCHER right
This detail from the Bayeux tapestry (above) shows an archer with his bow and arrows. He is wearing a typical Norman mail shirt and one-piece metal helmet.



Long handle for holding with two hands

Broad, crescent-shaped blade

Cutting edge made of hardened steel

THE DISCOVERY OF GREENLAND
Explorers, as well as warriors and traders, it was the Vikings, led by Eric the Red, who discovered and colonized Greenland in c. 982.



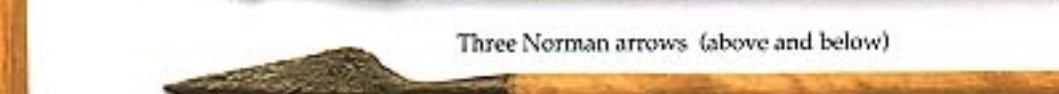
Norman knights using spurs and stirrups



NORMAN SPUR, c. 11th CENTURY
First used in ancient Greece and Rome, spurs helped the Norman knight, a skilful horseman, to control his horse in battle.



Three Norman arrows (above and below)



Arrowhead made of iron



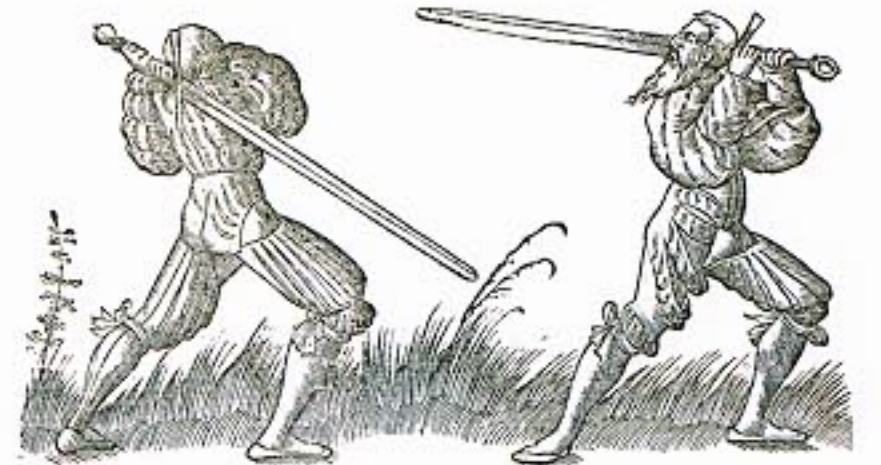
Sharply-pointed Norman lance



European swords

ONE OF MAN'S OLDEST WEAPONS, a sword consists of a hilt and a blade: the hilt has a pommel for balancing the weapon, a grip for holding it, and a guard for protecting the hand. The blade can be straight or curved and, according to whether the sword is designed for cutting, thrusting, or both, is either single or double edged, and has a rounded or pointed tip. For centuries, swords were used mainly for cutting and were easy to hold with one hand. But by the 1400s, massive two-handed swords were in use - weapons so heavy that only the strongest soldiers could wield them.

A 17th-century allegory of a sword-smith

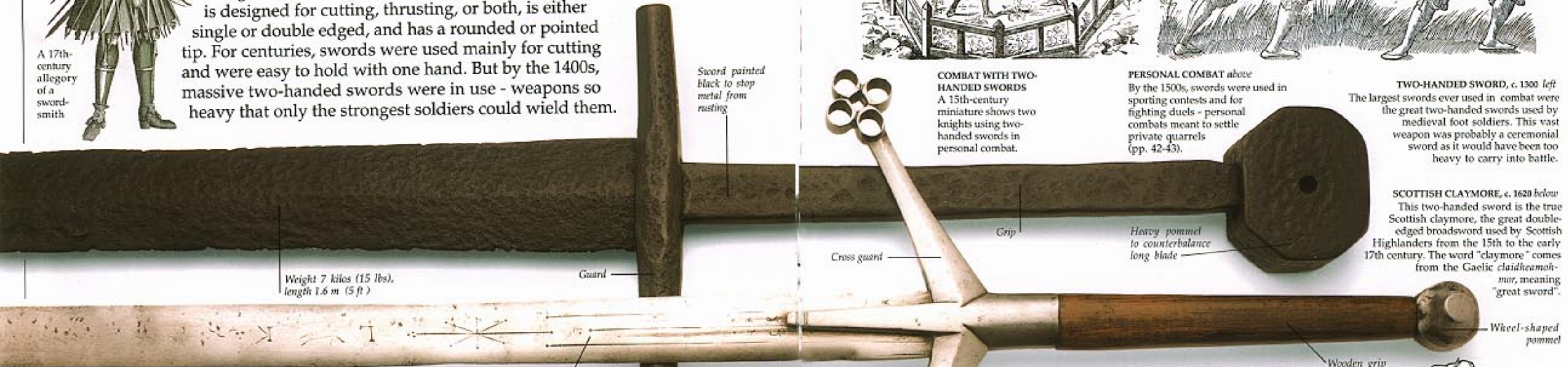


COMBAT WITH TWO-HANDED SWORDS
A 15th-century miniature shows two knights using two-handed swords in personal combat.

PERSONAL COMBAT above
By the 1500s, swords were used in sporting contests and for fighting duels - personal combats meant to settle private quarrels (pp. 42-43).

TWO-HANDED SWORD, c. 1300 left
The largest swords ever used in combat were the great two-handed swords used by medieval foot soldiers. This vast weapon was probably a ceremonial sword as it would have been too heavy to carry into battle.

SCOTTISH CLAYMORE, c. 1620 below
This two-handed sword is the true Scottish claymore, the great double-edged broadsword used by Scottish Highlanders from the 15th to the early 17th century. The word "claymore" comes from the Gaelic *claidheamh-mor*, meaning "great sword".



THE STORY OF KING ARTHUR
There are many versions of the legends surrounding the partly mythical, partly historical figure of King Arthur. This illustration, by the Victorian artist Walter Crane, shows Arthur being saved from death by Sir Launcelot, who is carrying a typical medieval sword.

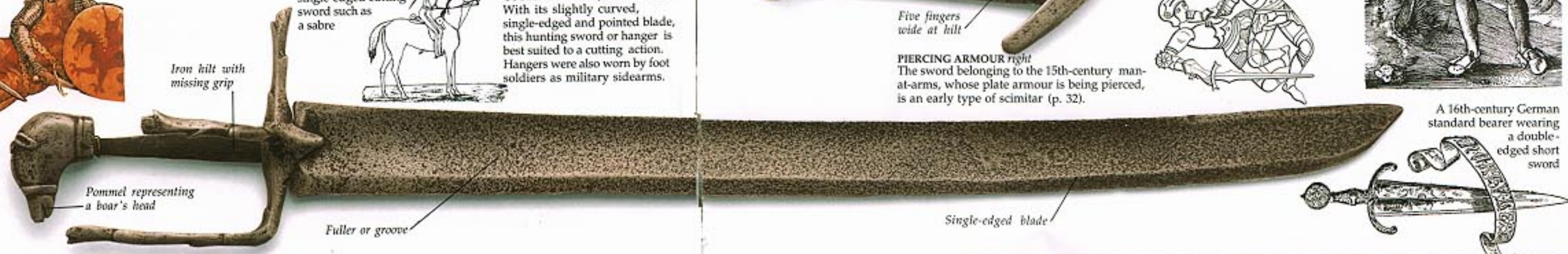


Sharp point for thrusting

The action of a single-edged cutting sword such as a sabre



CUTTING SWORD, c. 1580 below
With its slightly curved, single-edged and pointed blade, this hunting sword or hanger is best suited to a cutting action. Hangers were also worn by foot soldiers as military sidearms.



THRUSTING SWORD, c. 1480 below
The *cinquedea* was a type of short sword popular with wealthy Italians in the 1400s. The name refers to the blade, which was meant to be five fingers wide at the hilt.

PIERCING ARMOUR right
The sword belonging to the 15th-century man-at-arms, whose plate armour is being pierced, is an early type of scimitar (p. 32).

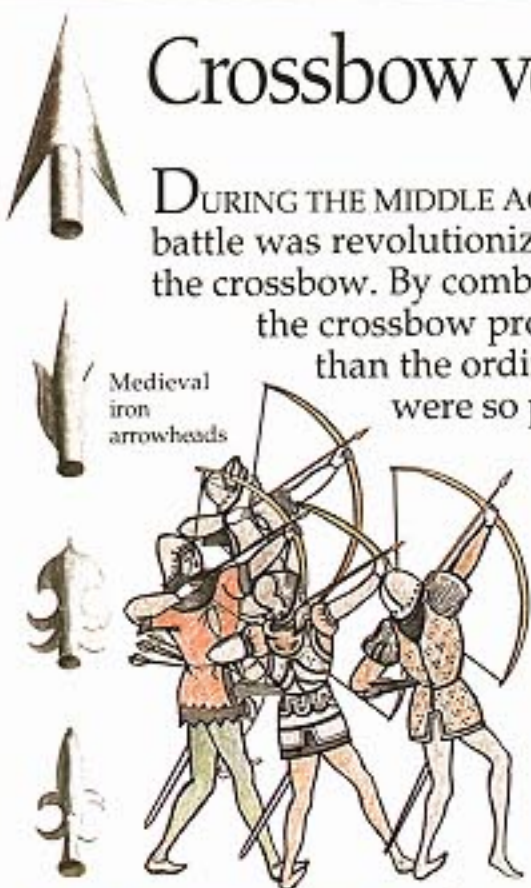


A 16th-century German standard bearer wearing a double-edged short sword



Crossbow versus longbow

DURING THE MIDDLE AGES the use of the bow in both hunting and battle was revolutionized by the appearance of the longbow and the crossbow. By combining archery with simple machinery, the crossbow proved a more deadly and accurate weapon than the ordinary bow (p. 9). Indeed some crossbows were so powerfully made they had to be loaded by a variety of mechanical devices. But despite the crossbow's greater range, it had a slower rate of fire than the longbow and was more expensive to make. The longbow was a much improved version of the ordinary bow and at a range of 91 m (100 yds) its steel-tipped arrows were deadly. With neither weapon having a clear lead over the other, many medieval armies contained corps of both bowmen and crossbowmen.



Longbowmen, from a 15th-century manuscript



SOLDIER USING CRANEQUIN
The cranequin, a rack and pinion spanning device, first appeared in the 14th century. Its slow winding action made it more practical for hunting than battle.

Firing a crossbow

- 1 Bowstring held in spanned (loaded) position by a rotating catch (the nut) set in crossbow tiller.
- 2 Bolt laid in groove along the top of stock and aimed by pressing rear of stock to cheek.
- 3 Bolt then released by pressing up the rear end of the trigger.

ARCHERS DEFENDING A CITY *left*
During the 15th century, many fortified towns trained archers to defend the city to which they belonged. Note the crossbowman winding a cranequin (see above).



ENGLISH YEW LONGBOW
Constructed from a single piece of wood, usually yew, the longbow was a formidable weapon when fired by highly trained archers. Longbow lengths varied from country to country, but in England the bow was usually the breadth of an archer's span between his outstretched arms, which in a tall man would equal his height.

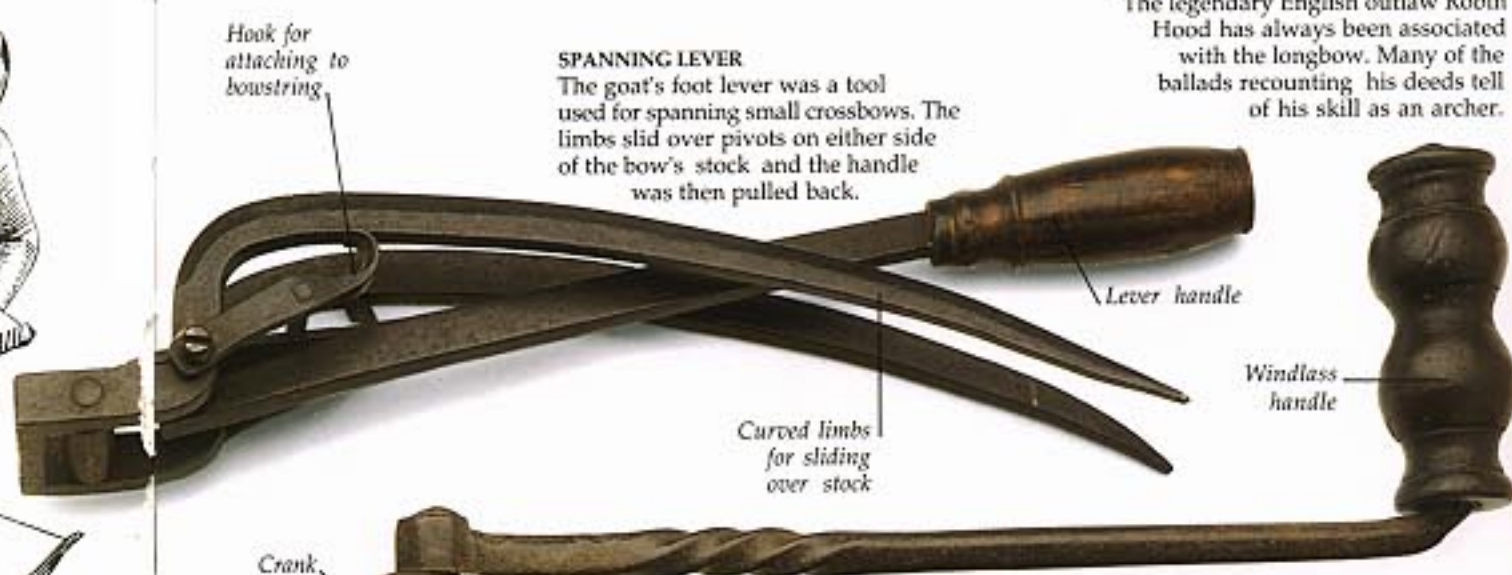


Horn nock or groove for attaching bowstring

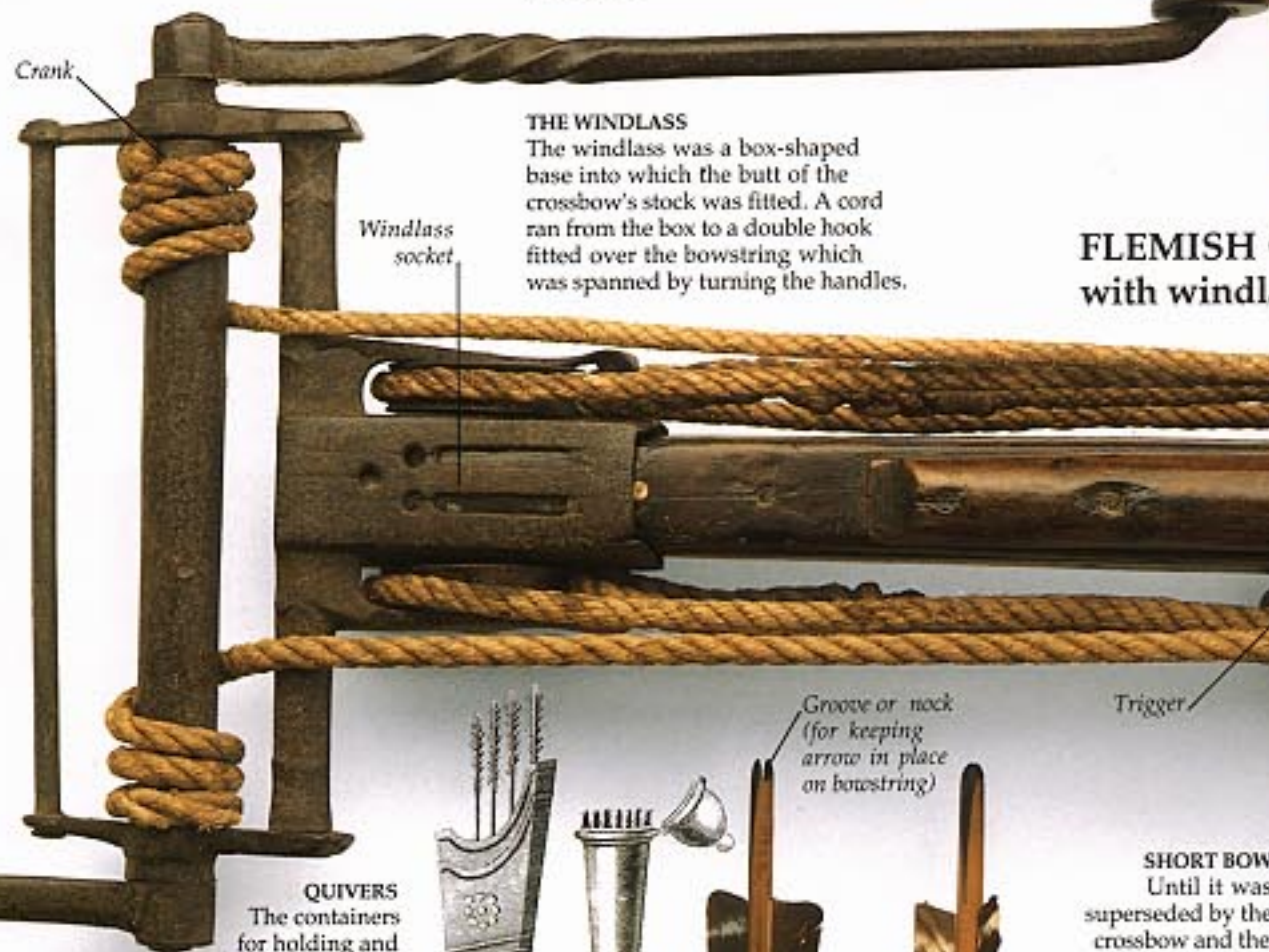
ENGLISH LONGBOW, c. 19th century



ROBIN HOOD
The legendary English outlaw Robin Hood has always been associated with the longbow. Many of the ballads recounting his deeds tell of his skill as an archer.



SPANNING LEVER
The goat's foot lever was a tool used for spanning small crossbows. The limbs slid over pivots on either side of the bow's stock and the handle was then pulled back.



THE WINDLASS
The windlass was a box-shaped base into which the butt of the crossbow's stock was fitted. A cord ran from the box to a double hook fitted over the bowstring which was spanned by turning the handles.

FLEMISH CROSSBOW with windlass, c. 16th century



QUIVERS
The containers for holding and transporting arrows or bolts were made of leather, metal or wood.

Groove or nock (for keeping arrow in place on bowstring)

Trigger

Stock or tiller

SHORT BOW
Until it was superseded by the crossbow and the longbow in the Middle Ages, the short bow was extremely popular.



LONGBOW ARROWS
The length of a longbow arrow was dependent on the length of the bow. Shafts were made of ash or birch, arrowheads of iron, and flights came from the wings of geese.

Flights or feathers

Bowstring usually made of hemp or flax

Grip



Mid 15th-century pavise or shield



15th-century soldier supporting a pavise for a crossbowman

PROTECTING THE CROSSBOWMAN *left* While loading and firing their weapons, archers and crossbowmen often sheltered behind a large shield called a pavise which was propped up or supported by another soldier (see left). Used in siege warfare from the 14th to the 16th centuries, pavises were made of wood and covered with canvas.



A group of 15th-century French crossbowmen shooting from behind pavises

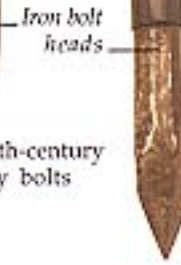
WILLIAM TELL According to legend, the national hero of Switzerland, William Tell, was forced to shoot an apple from the head of his own son with a crossbow. Tell was being punished for refusing to swear allegiance to the Austrians, who ruled his country in the 1300s.



INCENDIARY ARROWS Incendiary arrows and bolts were used in warfare until the 1600s. A wad of hemp or flax was soaked in a bituminous substance, fixed beneath the arrowhead, and then lit just before the arrow was shot.



16th-century crossbow bolt for warfare and hunting



Two 16th-century military bolts



Wooden shaft

Steel tip

MILITARY CROSSBOW BOLT *above* The accuracy and deadly penetration of bolts fired from the large military crossbows meant they could easily kill a man at a distance of 182 m (200 yds).



16th-century stone crossbow

Leather flight

Hemp bowstring

Stirrup (foot strap)

Groove where bolt fitted

ENGLISH BULLET CROSSBOW, early 18th century

LEVER FOR LOADING CROSSBOW Because bullet-firing crossbows were small and light they could be spanned by hand. The crossbowman placed his weapon against his chest and then operated a built-in bending lever by pressing a knob in the weapon's butt.

Lever knob



16th-century, highly ornamented sporting crossbow

BULLET CROSSBOW *above* Bullet crossbows were popular from the late 18th century to the early 19th century for both target practise and shooting small game. They had double bowstrings with a pouch in the centre for the bullet.

BACKSIGHT Backsights, situated in the middle of bullet and stone crossbows, had a number of apertures for sighting to different distances. The backsight in this weapon is lying flat and would have been pulled into an upright position for firing.

Backsight

Double bowstring with leather pouch

Sighting bead

SIGHTING BEAD A moveable sighting bead hung between the foresight pillars of bullet-firing crossbows.

Nock

Axes, daggers and knives



19th-century American infantryman carrying a bowie knife

AXES, DAGGERS AND KNIVES have been used as weapons since prehistoric times (pp. 6-7). At first, axe heads were made of stone or bronze, but by the Middle Ages they were usually made of steel or iron, and often had additional spikes or projections to make them appear even more formidable. Although daggers and knives seem similar to one another, a dagger with its two sharp edges running into a point, is essentially a stabbing weapon, while a knife with its single-edged blade is usually used for cutting. By looking at a selection

of axes, daggers and knives from all over the world it is possible to see how different countries produce blades and shafts to suit their own special requirements and cultures.



RING KNIFE
Worn as a ring round the user's forefinger, this curved knife can be found among the Bantu-speaking peoples of the Lake Turkana region in Tanzania, East Africa.

Ring placed round forefinger

Iron blade

THROWING KNIFE

This African throwing knife (pp. 8-9) comes from Zaire, West Africa. When thrown the knife turns about its centre of gravity so that it will inflict a wound on an opponent whatever its point of impact.

Wooden hilt bound in leather and copper

STABBING AXE below
An unusual-looking axe made by the Matabele people of Zimbabwe. As the top of the haft is angled in line with the pointed end of the blade, the axe can be used for a stabbing as well as a chopping action.



Worn in palm of hand

STABBING KNIFE left

An unusual type of knife, worn in the palm of the hand and then thrust forward by the user. It was made by northern Nigerian tribespeople.



AZTEC DAGGER
The Aztecs, Middle American Indians who once dominated Mexico, made this flint dagger with a mosaic handle.

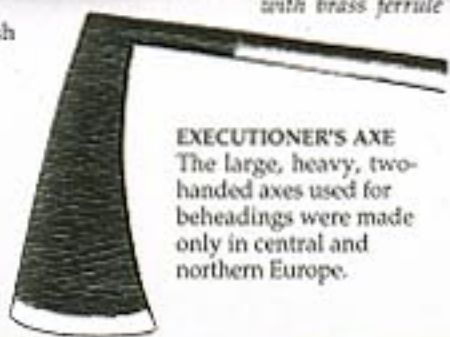


NAGA WAR AXE above
The *dao* is an impressive-looking all-purpose weapon used by the former head-hunting peoples from the Naga Hills of Assam in their inter-tribal warfare.

Long bamboo haft partly bound with rings of plaited cane

FOLDING KNIFE above
In this late 19th-century Spanish knife the blade folds back to sit partly within the hilt. The blade was locked into place by a steel spring in the hilt.

Hilt made of horn with brass ferrule



EXECUTIONER'S AXE
The large, heavy, two-handed axes used for beheadings were made only in central and northern Europe.

Plume of dyed animal hair

IGOROT AXE
Used as a tool as well as a weapon, this axe with its beautifully decorated haft was made by the Igorot or "Mountain People" of North Luzon in the Philippines.

Long slender blade with pronounced curve to cutting edge

MALAY DAGGER below
The dagger called a *kris* plays an important role in Malay culture with different areas having their own form of blade and hilt.



Ivory handle in form of Garuda, a mythological eagle

Characteristic wavy blade



Double-edged curved blade

SUDANESE DAGGER above
Of Arabian origin, a *jambiya* is used for both war and ceremony in the Middle East and India.

Hilt of carved horn with silver mounts and studs made of beaten silver coins



BATTLE-AXE PISTOL above
An elaborately decorated combination axe and wheel-lock pistol (p. 38), made for a 16th-century nobleman.



INDIAN BATTLE-AXE
Known as a *bhuj*, this knife-like battle-axe from north India is also called an "elephant's head" because of the characteristic decoration often found between the shaft and blade.

Covered cutting edge



WRIST KNIFE
A knife with a razor-sharp cutting edge (shown with a protective covering for safe handling), worn round the wrist. Made by the Suks of Kenya.

Single-edged blade

Pointed blade with long cutting edge



Hilt made of antler riveted to tang of blade

BOWIE KNIFE
This example of the hunting knife associated with the American frontiersman James Bowie was made in San Francisco in 1906.

Hollow metal haft for concealed dagger



Gilded pommel forms a handle for a concealed screw-in dagger

Plate and mail armour

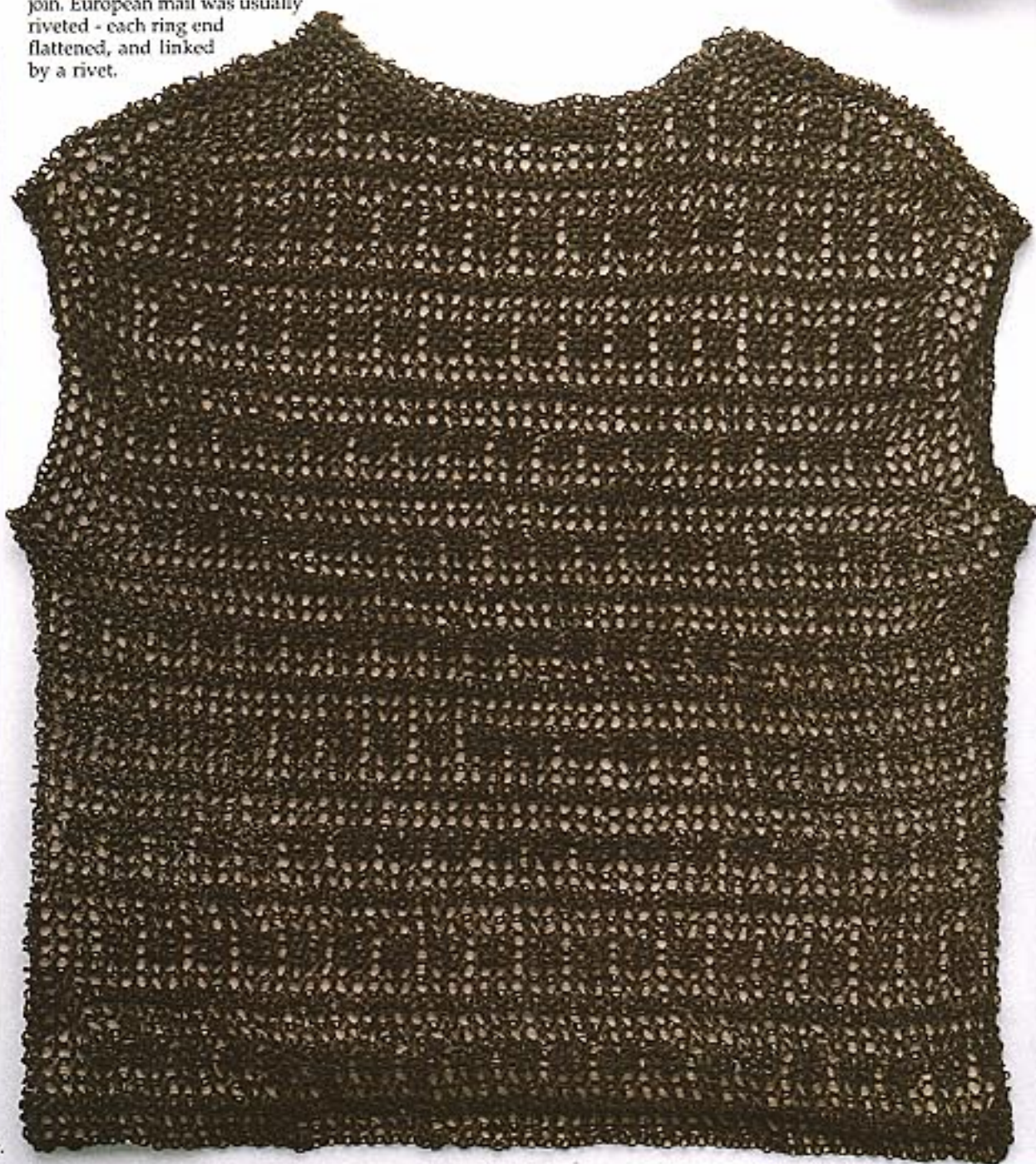
CHAIN MAIL - ARMOUR made from linked iron or steel rings - was the main type of armour worn from the Celtic period (pp. 10-11) until the 13th century. By then knights not only found mail armour uncomfortable to wear but also inadequate protection against weapons such as war hammers and two-handed swords. At first plate armour, which was gradually introduced in the 13th century, was simply added to mail armour. But from the 1400s until the advent of firearms in the 1600s, knights went to war entirely encased in suits of plate armour.

EARLY LEG DEFENSE
An Italian relief, c.1289, showing medieval leather leg protection.



MEDIEVAL KNIGHT IN MAIL ARMOUR
Detail from a window in the Palace of Westminster.

MAIL SHIRT
This oriental mail shirt is made of solid rings - made without any join. European mail was usually riveted - each ring end flattened, and linked by a rivet.



WAR HAMMER, c.1580 right
This armour-piercing French war hammer originally had a longer shaft for use by knights fighting on foot.



An armoured knight in an attitude of devotion, c.1290



A JOUST AT TOURS, c.1446
Until the 16th century, knights wore ordinary battle armour for jousting at tournaments (pp. 30-31).



GERMAN KNIGHT
A coloured engraving of a fully-armoured knight, drawn in about 1500. He is dressed in Maximilian armour, which was both heavier and rounder than earlier styles of plate armour.



AN ARMOURER'S WORKSHOP IN INNSBRUCK, c.1517
A specially strong and heavy type of armour, made in Germany and Austria during the 16th century, was called Maximilian armour after the Hapsburg emperor, Maximilian I. In this engraving Maximilian is visiting his chief armorer.

Roped turns for deflecting edged weapons

BREASTPLATE, c.1570
Made by a renowned Italian armorer, this light, strong, one-piece breastplate is a technically perfect piece of plate armour. Its style imitates the shape of a 16th-century doublet (close-fitting jacket).

Straps for attaching to a backplate



Decorated with engraved and gilded heavenly figures

Lance-rest for tilting (pp. 30-31)

Straps for attaching metal plate skirts to longer plates called tassets (p. 26)

Back plate of articulated steel plates, the last of which is shaped to the knuckles

One plate, the cuff, covers the wrist

GAUNTLET, c.1580 left
Made in north Germany, this gauntlet - the piece of armour that protected the hand and wrist - shows the intricacy and skill with which high-quality plate armour was made.



Exaggerated long pointed toe cap, articulated where foot bends

articulated plates along the length of the foot



A suit of armour



BY THE MIDDLE OF THE 15TH century a fully armed knight was virtually encased in plate armour. However, due to the skill of the late medieval armorer, he was not as restricted as he might appear; the armour joints were designed to permit a large amount of movement. The suit of armour on these

pages, belonging to an early 16th century knight, was made in an Italian workshop - the northern Italians and the southern Germans were the most celebrated armourers in Europe.

Large visor, with vents for breathing and eye slits, was designed to slide up onto the wearer's brow

Visor hinge and pivot

PROTECTING THE HEAD right
The knight's head was protected by a helmet. This particular type, a close helmet (p. 28), fits to the shape of the face and has connecting neck guard plates (known as gorget plates).



ST GEORGE KILLING THE DRAGON left
It is best not to study paintings too closely when looking for accurate depictions of medieval armour as the artist often romanticized even contemporary armour.

13th-century seal of a king of Bohemia, showing the field armour typical of that period



Leather strap and buckle for connecting breastplate to backplate

Vents for breathing

Neck edge and armpit has turns for deflecting edged weapons

Gorget plates to overlap with gorget

Strap for buckling skirt to tassets

Tassets made of articulated steel plates permitting freedom of movement at the waist

NECK DEFENSE
From the 13th century all types of armour had gorgets (collar plates).

BREASTPLATE SECTION OF CUIRASS
The cuirass, the armour that covered the torso, comprised a breastplate and a backplate connected to each other by straps. Extending from this breastplate are skirts and tassets - armour to protect the abdomen and upper thighs.

PAULDRON

VAMBRACE

SHOULDER AND ARM

GERMAN KNIGHT, c. 1485

GAUNTLET

SABATON (for protecting foot - p. 25)

PIKEMAN'S ARMOUR
Armed with a pike, sword and buckler (shield), a 17th-century pikeman's only armour was a morion helmet (p.28) and a cuirass.

PAULDRON

CUISSE

COWTER

COWTER

POLEYN

POLEYN

VAMBRACE

Hook for closing greave

Thumb plate

GAUNTLET (covered the hand - p. 25)

GREAVE

LEG PROTECTION
A cuisse protected the upper part of the leg, a greave the lower part. The knee was covered by a series of plates called a poleyn.

SABATON

Helmets

WARRIORS HAVE WORN protective helmets since the Bronze Age (pp. 10-11). But in the Middle Ages, helmets became

considerably larger so as to give greater protection to the face and neck. The heaviest and largest was the *heaume* or helm, an enormous helmet which a knight carried at his saddle when not fighting. In the late Middle Ages, helmets called bascinets were fastened to the rest of the body armour by screws and chains, and knights also wore types with pivotable sections such as the close helmet. A later development was smaller, lighter helmets such as the morion and the pot. After the 1600s steel helmets were mostly replaced by military headwear made of leather, brass, felt or fur.



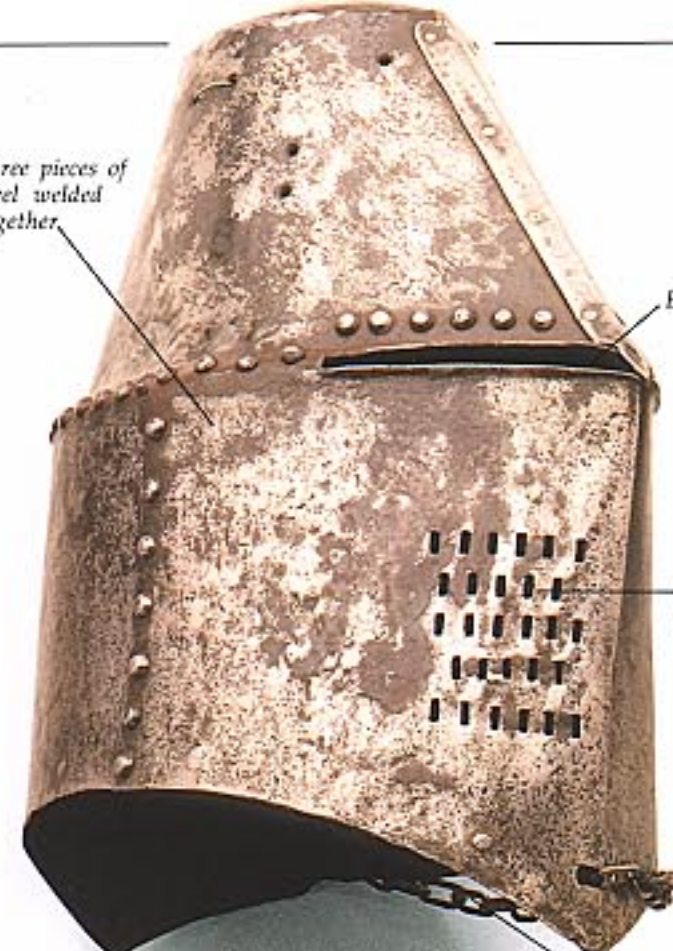
13th-century helmet with two eye slits and breathing holes



FLAT-TOPPED HELM
A 19th-century reproduction of a German *heaume* or helm, the type of helmet worn by the Crusaders and other European knights from the early 1200s. Its reinforcing strips are cross-shaped.



ARCHER, c. 1290 right
A mounted archer wearing a conical helm.



Three pieces of steel welded together

Eye slit

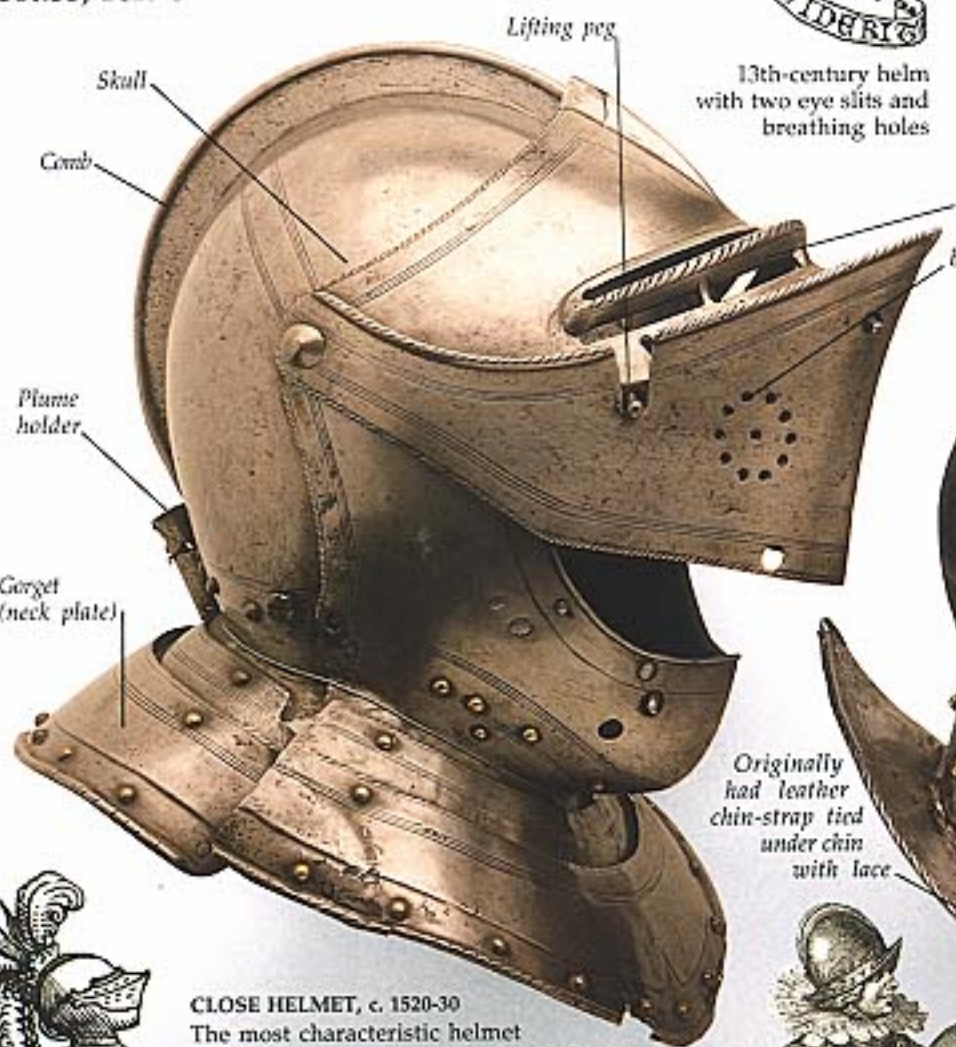
Breathing holes

CONICAL HELM, c. 1370
After the 1350s the helm was mainly used for tilting (pp. 30-31). This (19th-century reproduction) late helm would probably have been worn on top of a bascinet (right), placing an enormous weight on the knight's shoulders.

Guard-chain or safety chain - when helm not worn, it was often carried by chain



BASCINET, c. 1370
Between 1350-1450 the most popular type of helmet was the bascinet. Visors - hinged plates for protecting the face - were introduced about 1300. This German bascinet would originally have had a type of visor known as a *klappvisier*, which was hinged to a curved, vertical bar attached by two studs to the brow of the bascinet.



Lifting peg

Skull

Comb

Visor with eye slits and breathing vents

Plume holder

Gorget (neck plate)

Originally had leather chin-strap tied under chin with lace

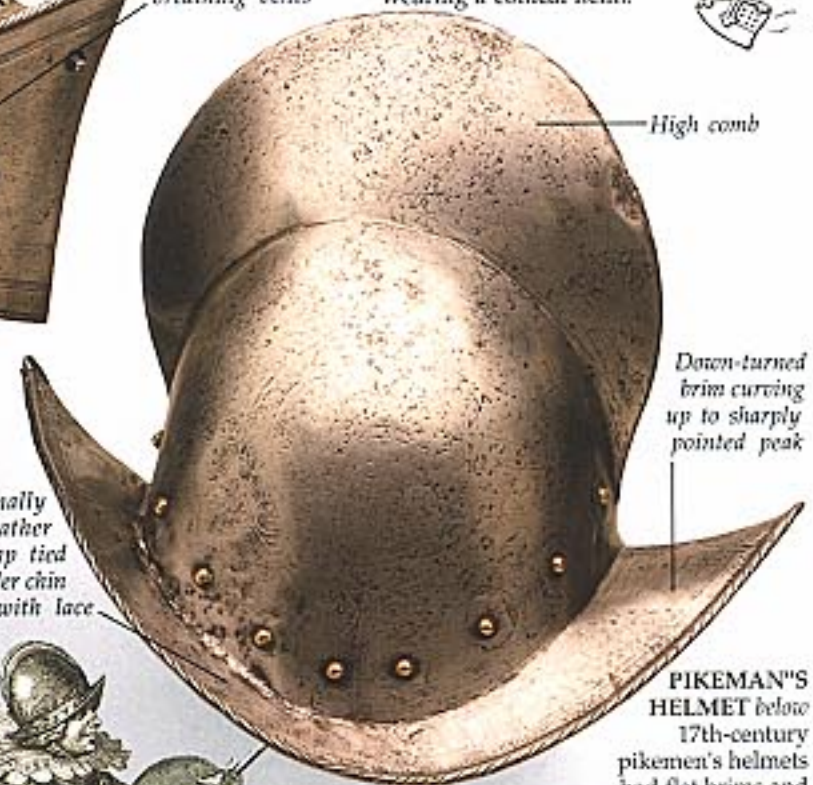
CLOSE HELMET, c. 1520-30

The most characteristic helmet of the 16th century was the close helmet (above and left), which unlike earlier helmets was shaped to the chin and had an attached gorget (p. 26).



COMB-MORION, c. 1580
A comb-morion was worn by infantry (as left), especially archers and musketeers, who found an open style of helmet more convenient when taking aim.

PIKEMAN'S HELMET below
17th-century pikemen's helmets had flat brims and laminated cheek-guards.



High comb

Down-turned brim curving up to sharply pointed peak



Sliding nasal bar

IRON HAT, c. 1640-50

An unusual helmet is this high-crowned iron hat with a sliding nasal bar, occasionally worn by horsemen during the English Civil War. Originally covered in material and with a plume, it looked like a civilian hat of the time.

Originally covered in cloth, probably velvet

17th-century musketeer wearing ordinary civilian hat



Laminated neck guard riveted to helmet's skull and partially shaped to neck

Face guard formed of three vertical bars

Cheek-pieces

"LOBSTER-TAILED" POT, c. 1630-50

A type of helmet worn in the mid-17th century originated in Germany, where it was called a *zischagge*. The English variation, worn by cavalry during the Civil War of 1642-48 (right), was known as the English pot or "lobster-tailed pot". It had a faceguard, neckguard and hinged cheek-pieces (left and above).



Tilting armour

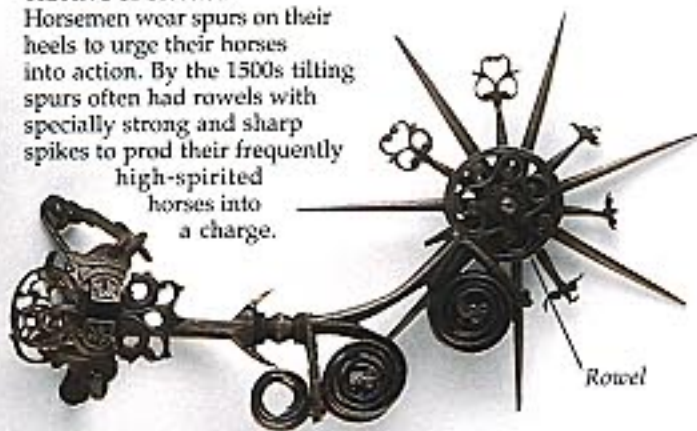
THE EARLIEST TOURNAMENTS - mock battles between mounted knights - probably began in the 1100s as a form of rehearsal for war. But by the 1400s tournaments had evolved into important and colourful social events at which knights displayed their fighting skills and courage before their monarch and their peers. The mock battles became known as jousts, and each joust started with two mounted knights charging each other with lances across a barrier known as a tilt. As tilting required additional protection for the left or target side of the body, special tilting armour was made for knights taking part in tournaments.

COATS OF ARMS
Tournament contestants were identified by the personal insignia displayed on their shields and tunics. Originally shown on the surcoats worn over chain mail, the insignia became known as "coats of arms".



TILTING HELMET, c. 1630 left
By the 17th century tournaments had become chiefly displays of horsemanship. Tilting armour became more showy as can be seen by this bronze tilting helmet with its grotesque human face mask.

TILTING SPUR below
Horsemen wear spurs on their heels to urge their horses into action. By the 1500s tilting spurs often had rowels with specially strong and sharp spikes to prod their frequently high-spirited horses into a charge.



A French knight tilting with a lance



A JOUSTING CONTEST above
By the 16th century, tournaments were accompanied by much formal pageantry. The field, or lists, was enclosed by barriers and overlooked by pavilions where royalty and other notables could watch. This depiction of a tournament shows King Henry VIII tilting with one of his knights, watched by his queen.



HORSE ARMOUR below
The complete set of armour that protected a war-horse in battle was called the bard. In a tournament the horse usually only wore the section of the bard known as the chanfron, a series of metal plates that protected its forehead and face. At the centre of the chanfron there was nearly always a shield with a spike projecting from the middle of it.



16TH-CENTURY CHANFRON

DON QUIXOTE TILTING AT WINDMILLS
In the novel *Don Quixote* an old knight's belief in the chivalric romances he has read leads him into a series of unusual adventures. During his travels Don Quixote tilts at windmills, imagining them to be giants.



Hole for attaching jousting armour to field armour

PROTECTING THE FACE, CHEST AND ARM
Added protection to the knight's face, neck and chest was provided by a heavy plate called a grandguard and to his left arm by another plate called a pasguard.



Bolt for attaching grandguard to field armour underneath

GRANDGUARD



Made entirely of steel

Staff chiselled with branches and interlacing strapwork

Chanfron with spiked shield



Wooden tilting lance

STEEL MACE, c. 1520 left
After the initial charge, a secondary weapon such as a mace was used in hand to hand combat. Its metal head was heavy enough to crush a man's skull.

Bolt for attaching pasguard to armour underneath

ITALIAN TILTING ARMOUR, c. 1540



MANIFER

PASGUARD

PROTECTING THE LEFT HAND
The manifer (from the French *main de fer* "iron hand") was a reinforcing section that protected the left gauntlet - armour covering the hand that held the shield or secondary weapon.

An Indian warrior

FOR MANY CENTURIES the Persians were the supreme craftsmen of Asia, and oriental arms and armour were dominated by Persian styles and workmanship. We know, for example, from early Indian art that, except for a type of shield, the Indian people did not develop their own armour until the 16th century when the Mogul invaders introduced Persian-style body armour and weapons. Although some Indian weapons such as the matchlock musket, were derived from European firearms, the arms and armour of the north Indian warrior shown on these pages were remarkably similar to that of a Persian or Turkish warrior.



19th-century engraving of a scimitar



MOGUL BATTLE SCENE below
The Moguls were Muslim warriors who founded a great empire in India, which lasted from the 16th to the 19th century. In this 17th-century Mogul miniature, the warriors are wearing characteristic north Indian armour and weapons.



LIGHTWEIGHT SABRE right
The *shamshir*, a light sabre, is a classic Indian sword. Originating in Persia, the weapon then spread to India, and eventually to Europe, where the type became known as the scimitar.

RECURVED DAGGER
This type of Indian dagger, known as a *khujjar*, has a slightly recurved double-edged blade. The handle is made entirely of steel.



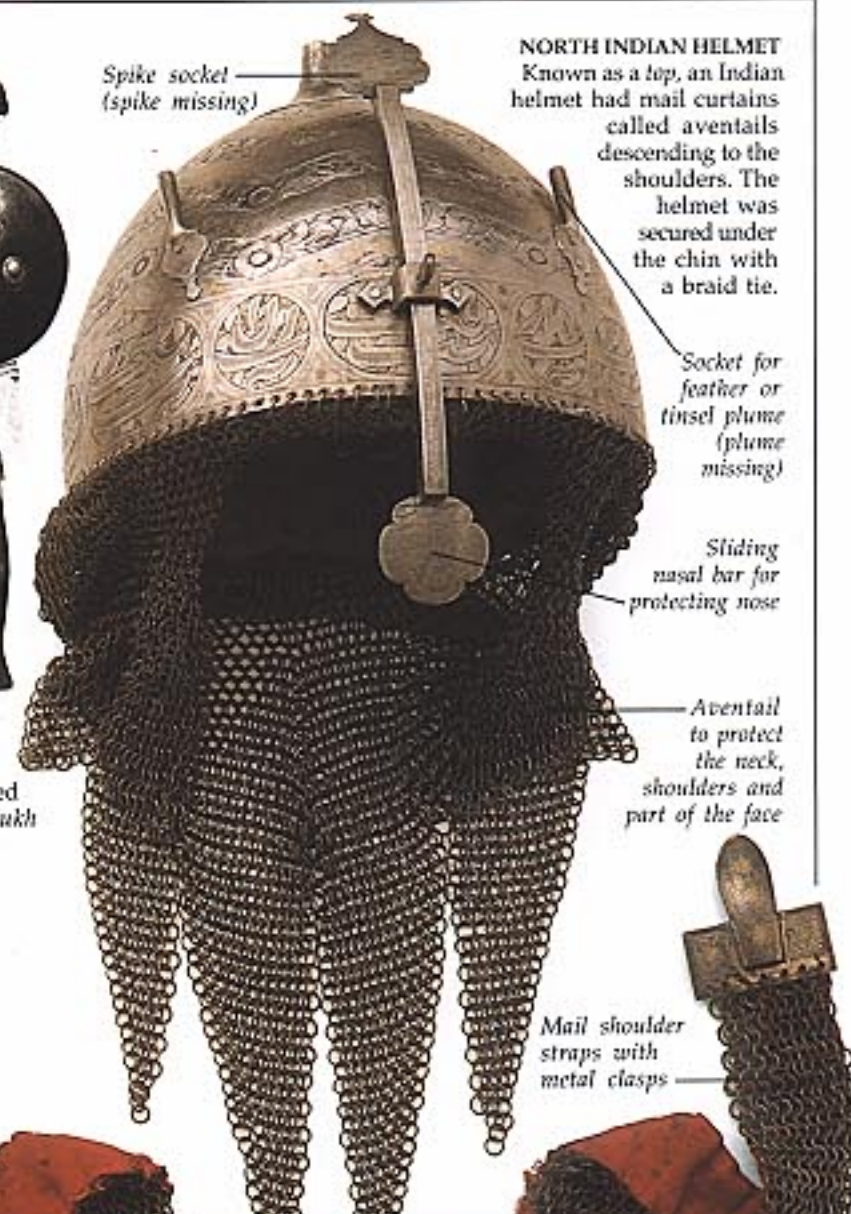
CIRCULAR STEEL SHIELD below
By the 18th century, Indian and Persian soldiers used a round shield (*dhal* or *sipar*) made of steel or hide (pp. 34-35). Four bosses covered the attachment of the handles for carrying the shield on the left arm.



INDIAN WARRIORS
Photograph, taken in 1857, of Rajput warriors. They are armed with a *dhal*, *talwar* and a *bandukh toradar* (matchlock musket).

Spike socket (spike missing)

NORTH INDIAN HELMET
Known as a *top*, an Indian helmet had mail curtains called *aventails* descending to the shoulders. The helmet was secured under the chin with a braid tie.



Socket for feather or tinsel plume (plume missing)

Sliding nasal bar for protecting nose

Aventail to protect the neck, shoulders and part of the face

Mail shoulder straps with metal clasps

Made of watered steel with chiselled and gilded decoration, north Indian, c. 19th century



ARM GUARD below
The tubular vambrace or *dastana* was fastened to the arm with straps. The chain mail extension is to protect the hand.

RECTANGULAR BREASTPLATE right
The Indian cuirass, known as a *char aina* (Persian for "four mirrors"), consisted of a light breastplate, a backplate and two side plates, all of which were shaped to fit on top of the warrior's mail shirt.



Lined gold damascened trellis pattern

Watered steel blade

Double-edged, watered steel blade

Sling hoops in decorated enamel

Velvet lining

Wooden shamshir scabbard bound in tooled leather

Decorated in gold and silver false damascene

FIGHTING AXE
A popular weapon among Indian warriors was the *tabar*, an all-steel axe (pp. 34-35). This particular type of *tabar* has a sharp pick opposite a crescent-shaped blade.

Indian weapons



Sikh soldier using a matchlock musket, c. 1846

DESPITE THE FOREIGN INFLUENCE on Indian arms and armour (pp. 32-33), some Indian states and peoples developed specialist weapons of their own which they continued to use up until the beginning of the 20th century, alongside Indo-Persian swords and European-style muskets. These characteristic and often beautifully decorated weapons include the *katar*, the Hindu thrusting dagger, and the *chakram*, the steel war quoit worn by Sikh warriors on their turbans.



MULTI-ARMED DEMON above top
A painting of a well-armed Hindu demon. His weapons include an axe, thrusting dagger, tridents, swords, mace, and a spear.

ARMOUR-PIERCING DAGGER above
The *push-kabz* was a specialist dagger from Persia and north India, used mainly for piercing chain mail. The blade was wide at the hilt, narrowing to a cutting edge before tapering to a sharp point.



Jade handle inlaid with rubies and diamonds

Dagger that screws into hollow axe hilt



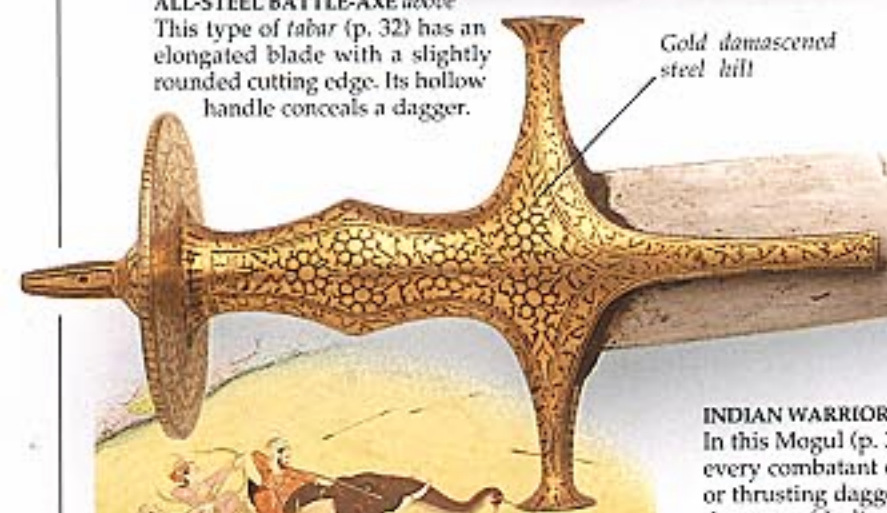
Hollow handle for dagger



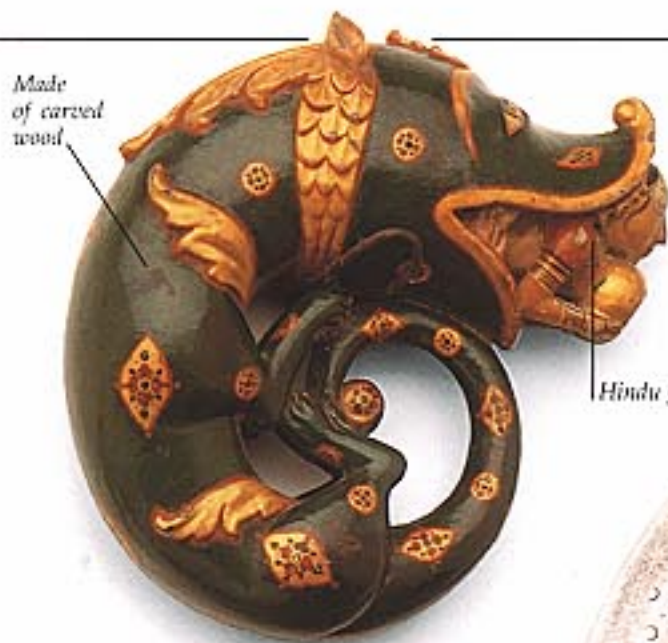
ALL-STEEL BATTLE-AXE above
This type of *tabar* (p. 32) has an elongated blade with a slightly rounded cutting edge. Its hollow handle conceals a dagger.

Gold damascened steel hilt

SINGLE-EDGED SWORD below
The *tulwar* was a curved sword widely popular in India. This one has the short grip and dish-like pommel characteristic of the Punjab region.



INDIAN WARRIORS IN BATTLE left
In this Mogul (p. 32) battle scene every combatant carries a *katar* or thrusting dagger. There is also the type of Indian sword, the *tulwar*, and some soldiers are carrying the shield known as a *dhal*. Other weapons being used are a bow and arrows, a spear and a musket.



Made of carved wood

Hindu god

MATCHLOCK POWDER FLASK
Matchlock muskets, *bandukh toradars*, were used in certain parts of India until the early 20th century. This painted and gilded matchlock powder flask, carved in the shape of a fish, has a Hindu goddess coming out of its mouth.

WAR QUOIT
Used mostly by the Sikhs of north-west India, the *chakram* is a flat steel quoit with a razor-sharp outer edge. Several quoits were worn around a tall, conical turban and were either whirled around the forefinger before throwing or held between the thumb and forefinger and thrown underarm.



Sharpened outer edge

Rounded inner edge

Sikh soldier spinning a *chakram* round his forefinger



Inlaid with silver gilt panels

Inlaid with silver and gilt

Square hammerhead

Single-edged curved blade

Large double-edged blade

THRUSTING DAGGER right
The Hindu dagger, the *katar*, is only found in India. Made entirely of steel, the weapon has an H-shaped handle which is gripped in the fist and used at close quarters in a punching action.



Metal strips protecting wrist

Two parallel bars form grip

HIDE SHIELD left
This type of *dhal* (pp. 32-33) is made of hide and is decorated with paintings of Hindu gods.



A Japanese samurai



A *tsuba* (or sword guard)

JAPANESE WEAPONS and armour are quite unique. Developed over many centuries, the armour is far more decorative than its European or Middle Eastern counterparts, especially the highly ornamented type worn by the warriors known as samurai (Japanese for "soldier"), whose code of honour dominated Japanese military life from the 12th century until 1868, when the samurai class was abolished. Japanese arms are equally well constructed, especially their swords, without doubt the finest ever made.



Wooden sheath for spear head

Metal collar to protect point of junction in a decorative manner

Ornamentation with mosaic design made of mother of pearl

Lacquered hilt

Known as *tsuba*, Japanese sword guards are collectors' items (above left)

Hilt made of wood covered with fish skin and bound with flat braid

DAGGER above
An example of the typical Japanese dagger (the *tanto*) with its single-edged blade.

SPEAR left
Short-bladed spears (*yari*) were carried by horsemen. Foot soldiers carried longer-bladed *yari* (see right).

SHORT SWORD left
A samurai carried both a short and a long sword. This 17th-century sword is a *wakizashi*, a short sword used not only as an additional fighting sword, but also for the ritual suicide, *seppuku*.

Blade made by covering a soft iron core with layers of steel

Flecked lacquer sheath

Silken cord for securing sword to girdle

Large crayfish design in black lacquer

A *wakizashi* scabbard (a *saya*), made of lacquered wood (below)



A SAMURAI COMBAT left
This early 19th-century print shows a sword fight between two samurai fighting with *katana*, long fighting swords. Their secondary swords, *wakizashi*, are tucked through the girdles around their waists.

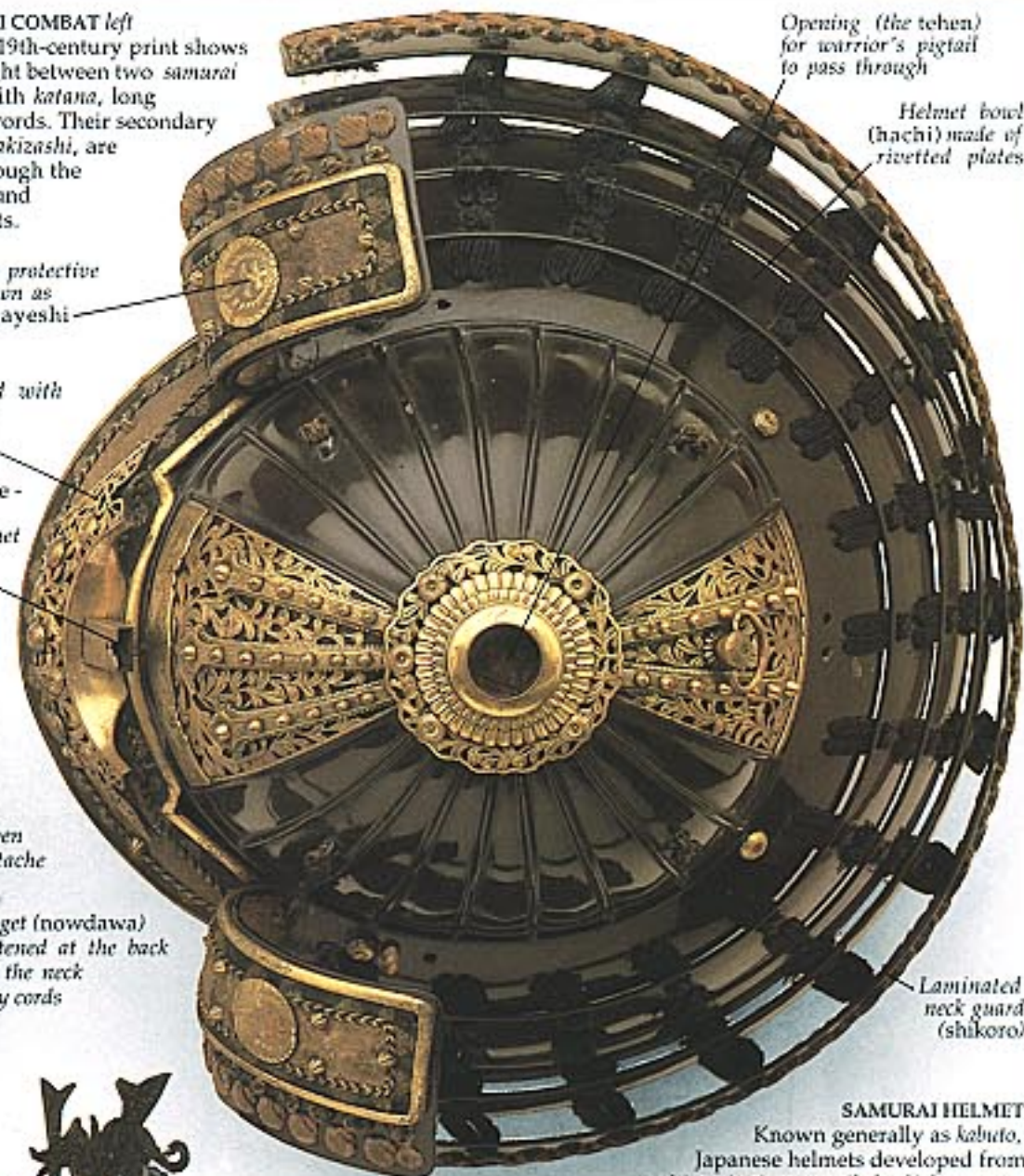
Wings or protective flaps known as the *fukigayeshi*

Decorated with brass and lacquer

The *maidate* - the socket for the helmet crest

Opening (the *tohen*) for warrior's pigtail to pass through

Helmet bowl (*hachi*) made of rivetted plates



Laminated neck guard (*shikoro*)

SAMURAI HELMET

Known generally as *kabuto*, Japanese helmets developed from prehistoric times until the 19th century with each period having its own distinct features and design. The *kabuto* was secured to the head with cords attached to the brim.

Japanese general wearing a *kabuto* helmet with a helmet crest or *kasajirushi*

ARMOURED SLEEVE

A type of vambrace (p. 27), the armoured sleeve (*kote*) protected the arm from spears and swords. Made of close-fitting material, it was laced over the arm and tied around the chest.



Kabuto helmet with horn-shaped crest



Cord for attaching mask to helmet

Hempen moustache

Gorget (*nowdawa*) fastened at the back of the neck by cords

WAR MASK

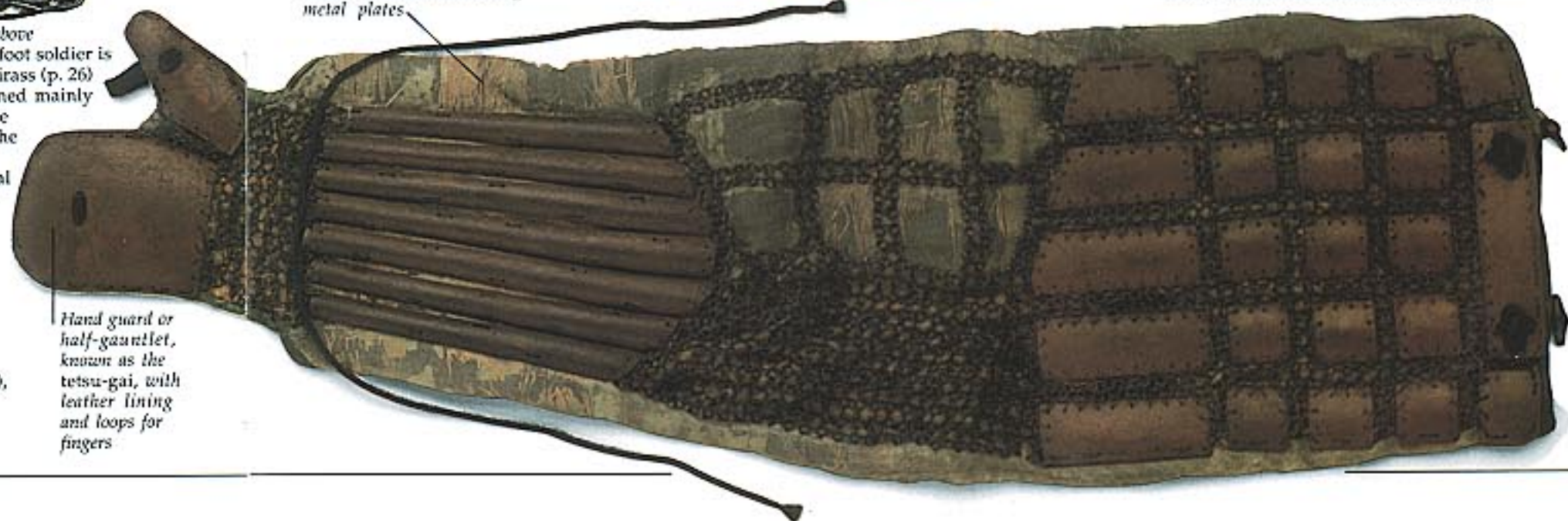
Warriors wore different types of war masks or *menpo*, such as this half-mask with a nose-piece called a *mempo*. Masks not only secured the helmet firmly to the head but also gave the wearer a more frightening appearance.

Made of silk overlaid with chain mail connecting metal plates

FOOT SOLDIER above
This 19th-century foot soldier is wearing a light cuirass (p. 26) or *karamaki*. Designed mainly for foot soldiers, the *karamaki* covered the soldier's breast and sides with additional skirts (the *kasazuri*) protecting his lower torso.

SCABBARD FITTINGS
A small knife known as the *kozuka* (left) and a skewer, the *kogai* (far left), were carried either side of *tanto* scabbards.

Hand guard or half-gauntlet, known as the *tetsu-gai*, with leather lining and loops for fingers

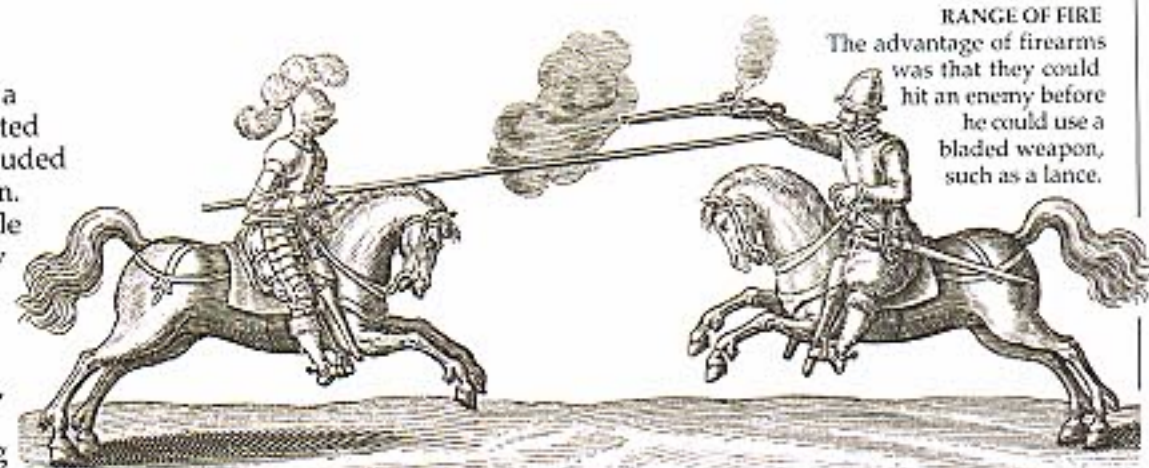


Early firearms

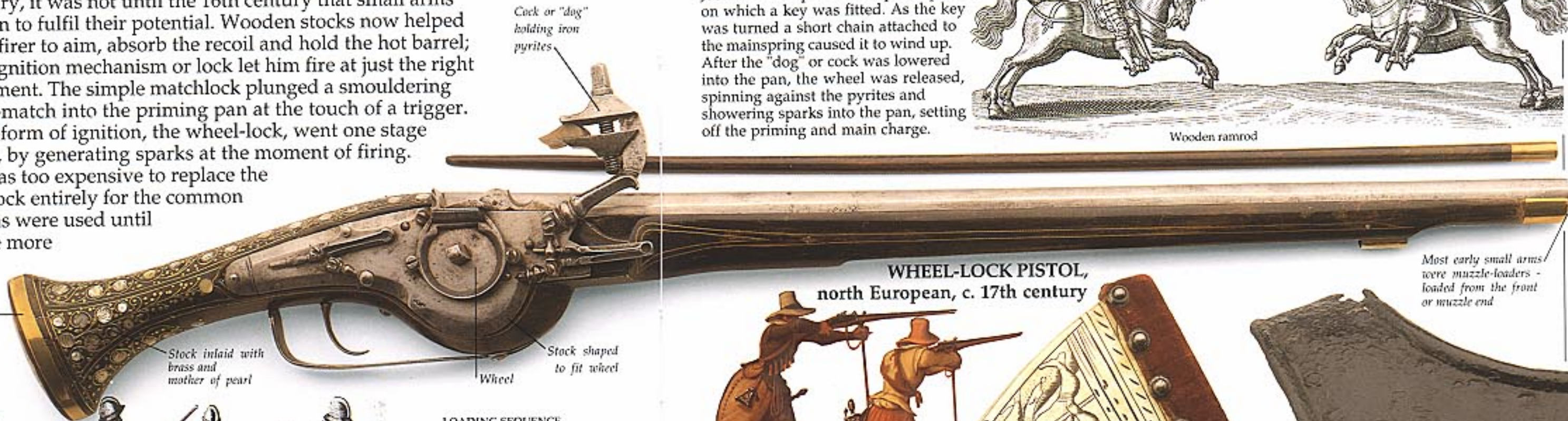
ALTHOUGH GUNPOWDER was used in Europe in the 14th century, it was not until the 16th century that small arms began to fulfil their potential. Wooden stocks now helped the firer to aim, absorb the recoil and hold the hot barrel; an ignition mechanism or lock let him fire at just the right moment. The simple matchlock plunged a smouldering slow-match into the priming pan at the touch of a trigger. A later form of ignition, the wheel-lock, went one stage further, by generating sparks at the moment of firing. As it was too expensive to replace the matchlock entirely for the common

LIGHT CAVALRYMAN
Wheel-lock pistols were the first small arms carried by cavalrymen.

soldier, both these systems were used until they were replaced by the more efficient flintlock (pp. 40-41).



RANGE OF FIRE
The advantage of firearms was that they could hit an enemy before he could use a bladed weapon, such as a lance.

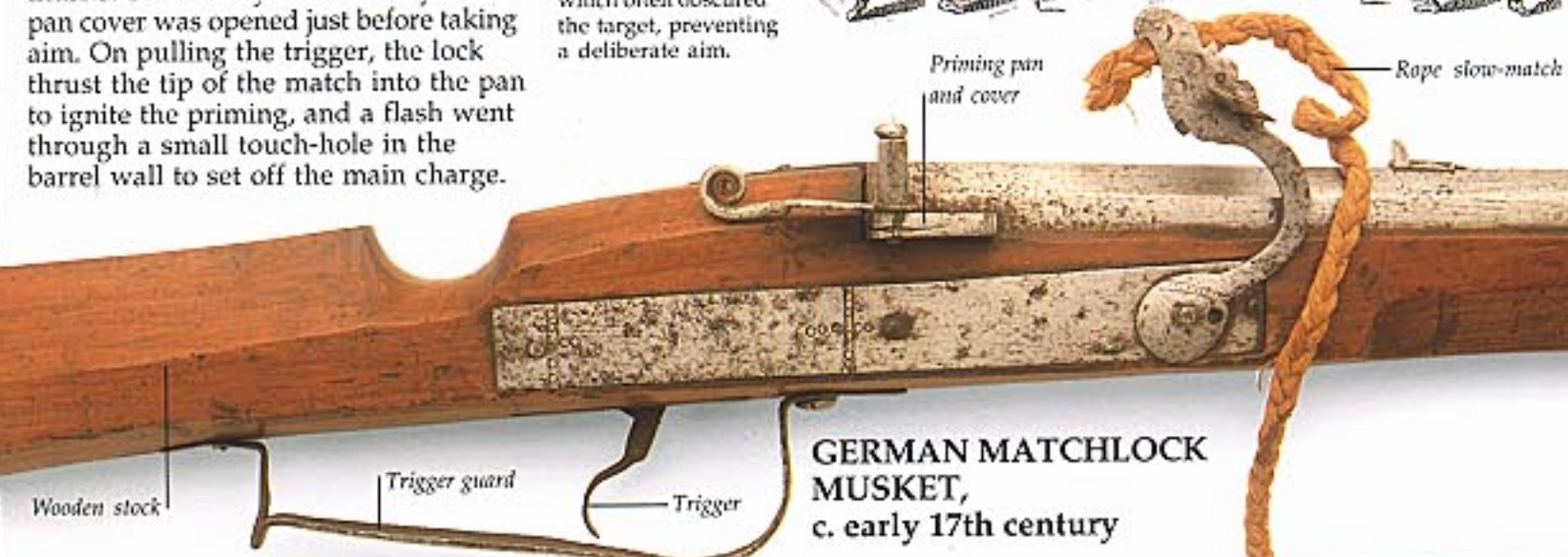


LOADING SEQUENCE
Early muzzle-loaders may appear simple, but they had to be loaded in strict sequence to prevent misfiring or personal injury. On the left are a few of the loading and firing actions taught to soldiers using these early firearms.

The matchlock

This matchlock is a typical infantry musket of the early 17th century. The pan cover was opened just before taking aim. On pulling the trigger, the lock thrust the tip of the match into the pan to ignite the priming, and a flash went through a small touch-hole in the barrel wall to set off the main charge.

OBSCURING THE TARGET
One disadvantage of the original black gunpowder was the dense white smoke it produced, which often obscured the target, preventing a deliberate aim.



GERMAN MATCHLOCK MUSKET, c. early 17th century

The wheel-lock

This lock produced sparks by holding a piece of iron pyrites against the serrated edge of a spinning wheel, which protruded through the bottom of the priming pan. Just below the pan was a square spindle on which a key was fitted. As the key was turned a short chain attached to the mainspring caused it to wind up. After the "dog" or cock was lowered into the pan, the wheel was released, spinning against the pyrites and showering sparks into the pan, setting off the priming and main charge.



Most early small arms were muzzle-loaders - loaded from the front or muzzle end

Flintlock firearms

MORE RELIABLE THAN THE MATCHLOCK and cheaper than the wheel-lock (pp. 38-39), flintlock ignition was used on most European and American firearms from the late 17th century until the 1830s. Probably invented in France by Martin Le Bourgeois in the 1620s, the flintlock mechanism could be set in two positions - one for firing and one for safety. With its basic design improved only by a few details, the flintlock ignition was not only to dominate the battle-

fields of all the major wars of that period, but was an important civilian weapon, used for duelling (pp. 46-47), self-defence (pp. 48-49), and shooting game, with many of these weapons showing the highest standards of craftsmanship.

Loading and firing a flintlock (also pp. 46-47)

- 1 Set lock to "half-cock" safety position.
- 2 Pour correct amount of powder from powder flask (p. 39) or cartridge down barrel.
- 3 Ram ball, wrapped in its patch (p. 46) or cartridge down barrel with ramrod.
- 4 Pour small amount of powder from powder flask into priming pan.
- 5 Close pan cover.
- 6 Set lock to "full-cock" position and fire.

MUSKET CARTRIDGE POUCH
Each paper cartridge contains powder and ball for one shot.



Musket ball

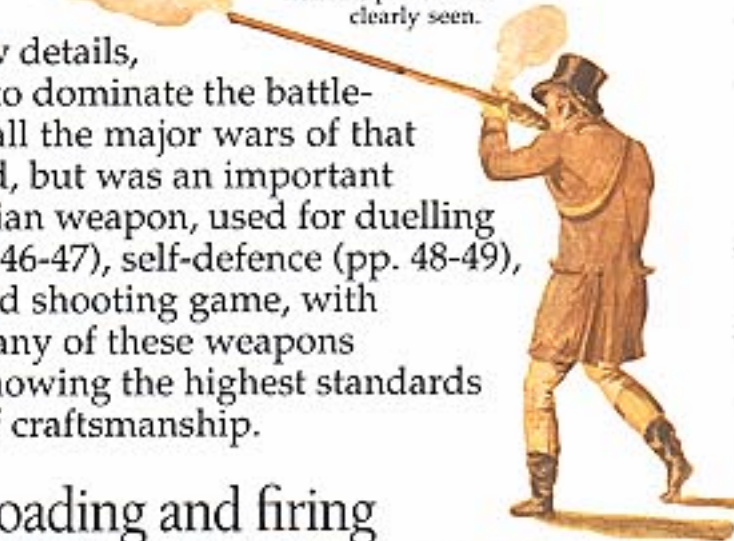
FLINTLOCK MUSKET
This late 18th-century India Pattern musket comes from the family of longarms sometimes known as Brown Bess muskets. These muskets were so strong, simple to use and relatively reliable, they remained the main British infantry weapon from the 1720s to the 1840s.

SOCKET BAYONET
This bayonet was designed to accompany Brown Bess muskets. Most European and North American armies used triangular-bladed bayonets with a socket to fit over the muzzle.



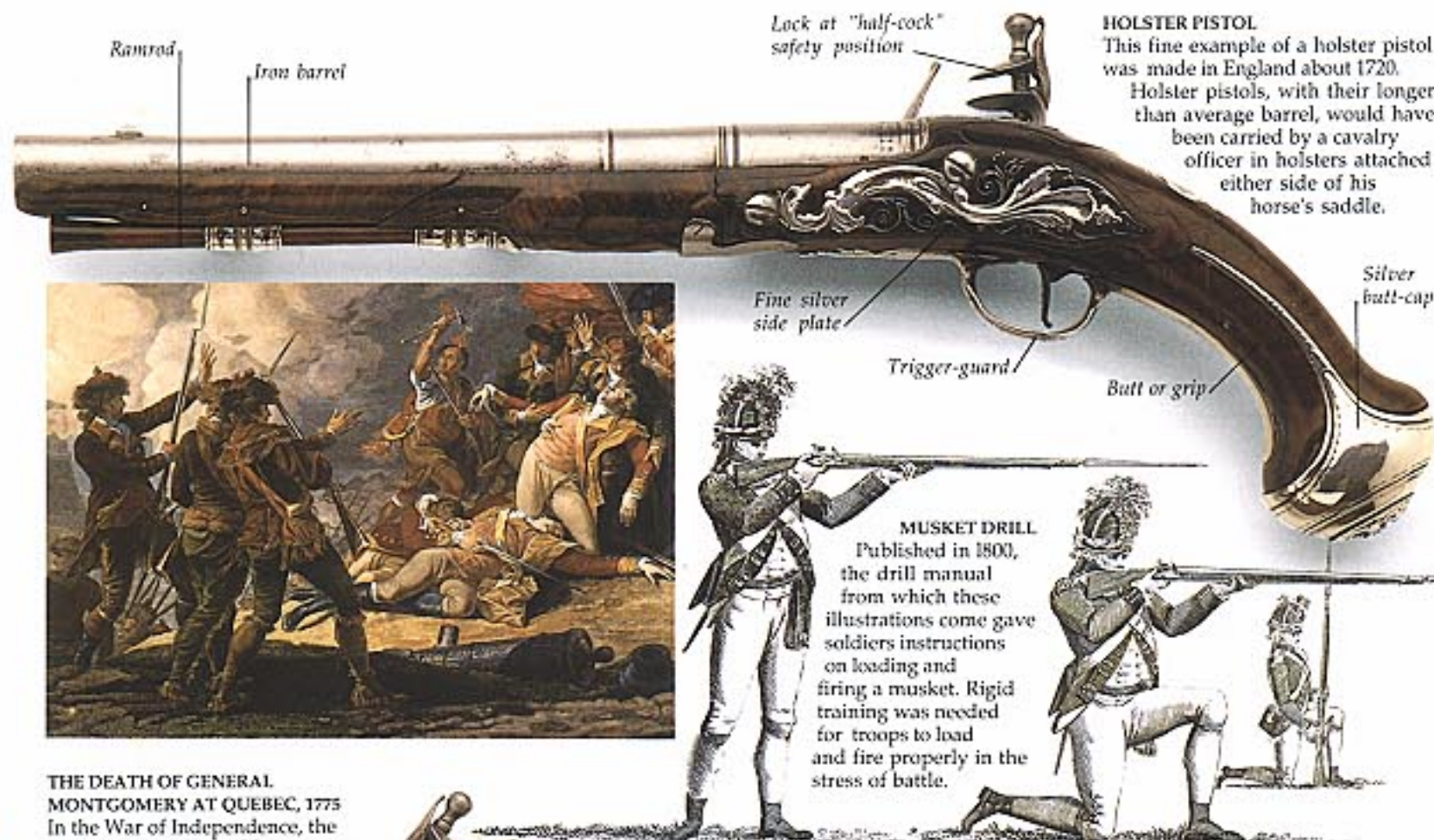
The pirate Long John Silver in Robert Louis Stevenson's *Treasure Island*

SPORTSMAN SHOOTING GAME
As the hunter fires his flintlock "fowling piece" the flash from the pan can be clearly seen.



Brown walnut stock

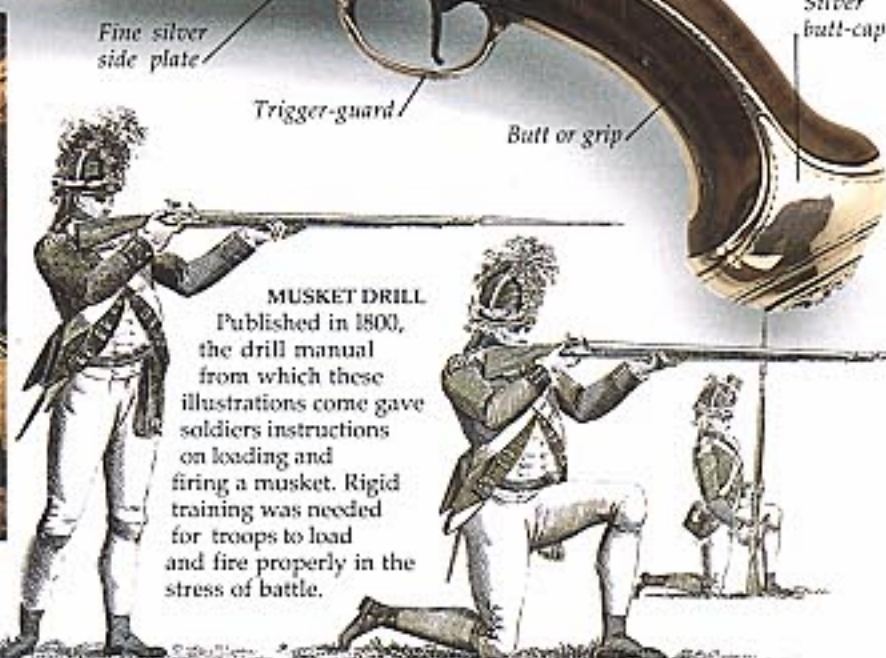
Brass butt-cap



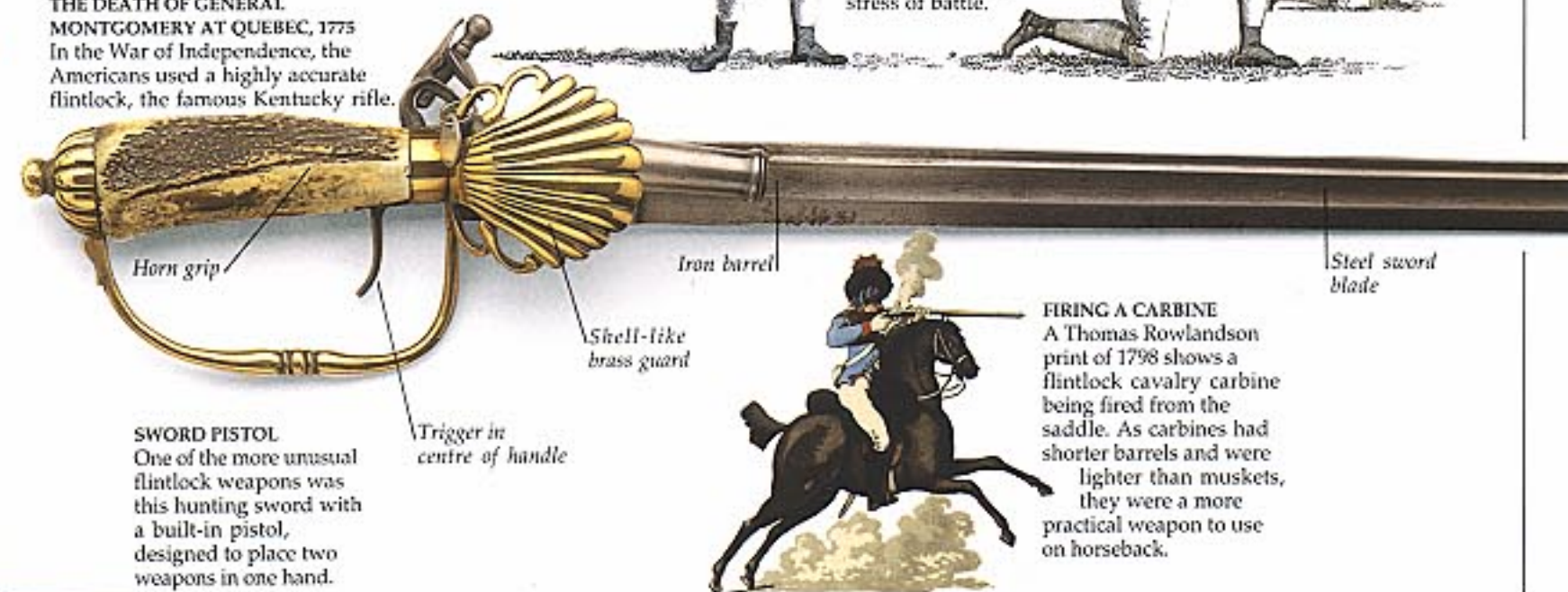
HOLSTER PISTOL
This fine example of a holster pistol was made in England about 1720. Holster pistols, with their longer than average barrel, would have been carried by a cavalry officer in holsters attached either side of his horse's saddle.



THE DEATH OF GENERAL MONTGOMERY AT QUEBEC, 1775
In the War of Independence, the Americans used a highly accurate flintlock, the famous Kentucky rifle.

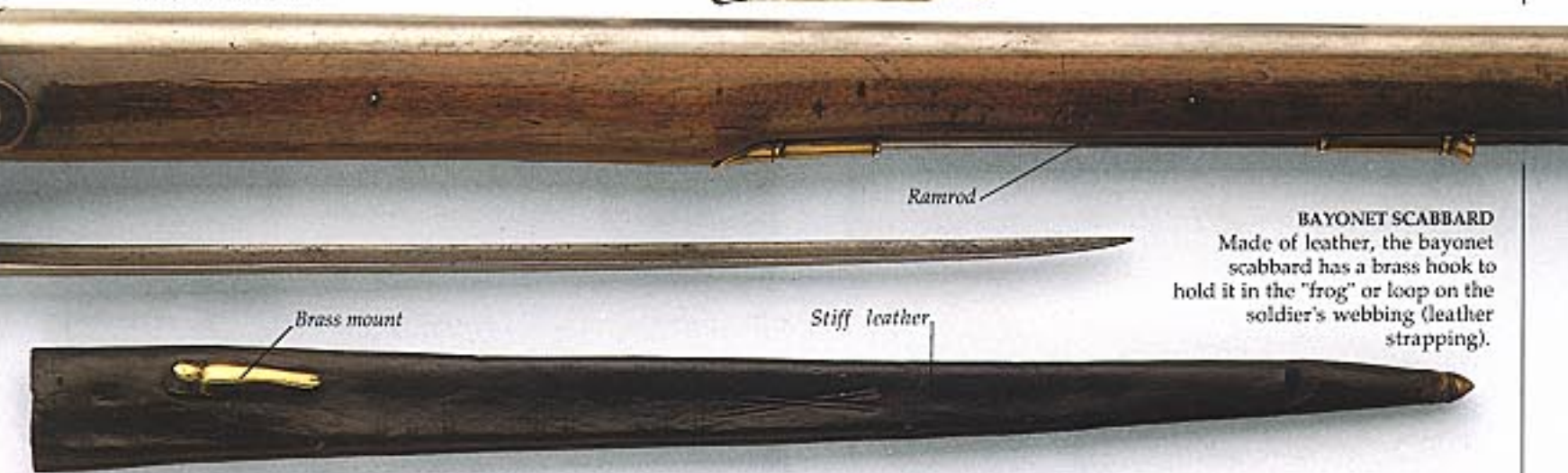


MUSKET DRILL
Published in 1800, the drill manual from which these illustrations come gave soldiers instructions on loading and firing a musket. Rigid training was needed for troops to load and fire properly in the stress of battle.



SWORD PISTOL
One of the more unusual flintlock weapons was this hunting sword with a built-in pistol, designed to place two weapons in one hand.

FIRING A CARBINE
A Thomas Rowlandson print of 1798 shows a flintlock cavalry carbine being fired from the saddle. As carbines had shorter barrels and were lighter than muskets, they were a more practical weapon to use on horseback.



BAYONET SCABBARD
Made of leather, the bayonet scabbard has a brass hook to hold it in the "frog" or loop on the soldier's webbing (leather strapping).

Duelling swords



How 17th-century practice rapiers were held

ALTHOUGH FORMIDABLE WEAPONS, the swords taken into battle by medieval knights and foot soldiers had a relatively simple design (pp. 16-17). However, during the 16th century sword designs changed, with some blades becoming narrower, longer and more pointed. These swords, known as rapiers, were designed for well-off gentlemen and aristocrats, not only to defend themselves against casual attacks but also to take part in formal prearranged sword fights known as duels. The art of fighting with a rapier became known as fencing, and as fencing techniques became more sophisticated, sword guards became more complex with the need to protect a civilian's unarmoured hand. The greatest swordsmiths of this period came from Toledo in Spain, Milan in Italy, and Solingen in Germany, and many of the weapons they produced are artistically superb examples of the craft of swordmaking. By the 1650s, rapiers were being replaced as dress swords and duelling swords by a lighter, shorter type of sword with a simpler guard known as a smallsword or court sword. Gentlemen continued to wear smallswords until the end of the 1700s, by which time duels were being fought with pistols (pp. 46-47).



Knuckle guard

RAPIER, c. 1630
In the 1500s, thrusting swords known as rapiers became popular with civilians. Because they had short grips and were impossible to hold with the whole hand, some rapiers had distinctive guards that protected the thumb and forefinger by partly covering the blade.

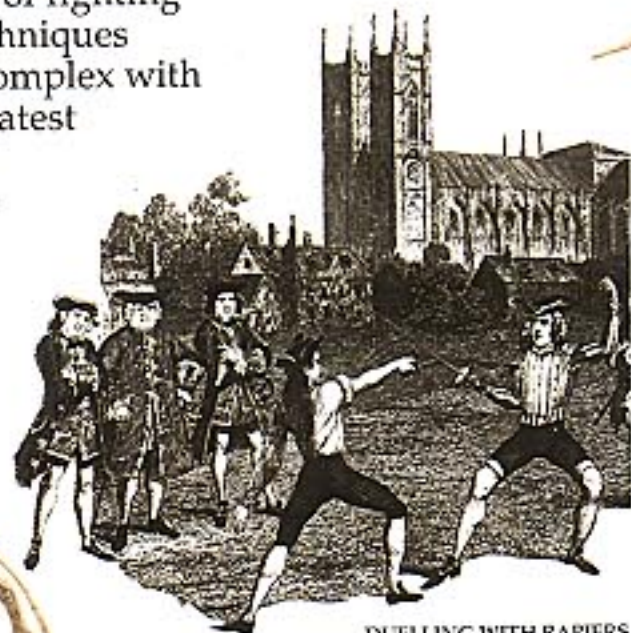
"THE THREE MUSKETEERS"

The famous historical novel by Alexandre Dumas takes place in France from 1625 to 1665. Wishing to become one of Louis XIII's guardsmen, D'Artagnan involves himself in duels with three renowned swordsmen. The joint exploits of D'Artagnan and these three musketeers form the book's narrative.

Guard forming two loops that surround the sword's blade, known as pas d'âne

Base of hilt resembling twigs or small branches

Counter-curved quillons



DUELLING WITH RAPIERS
An 18th-century drawing by George Cruikshank for a novel called *The Miser's Daughter*. The duel is taking place in Tothill Fields in London, used as duelling grounds for several centuries.



PARRYING WITH A DAGGER
The art of fighting with a rapier, known as fencing, was developed principally in France and Italy in the early 1600s. This engraving of a fencer practising with a left-handed dagger was drawn by Jacques Callot.



Long, thin double-edged blade

Straight, double-edged blade - some mains gauches had prongs to catch an adversary's sword

As the grip is very short, the thumb extended onto the blade

PARRYING DAGGER, c. 1650 left
A special dagger for parrying an opponent's blow in duelling was misleadingly called a *mains gauche* (French for left hand), even though it could be held in either hand.

FENCING MOVE, c. 1640
The swordsman on the right, using a rapier and parrying dagger, passes his adversary, and disengages under his dagger, thus killing him.



Light, triangular-sectioned thrusting blade

A CELEBRATED FRENCH DUEL right
A 19th-century engraving depicts a duel, fought in Paris in 1578, that involved Henri III's favourite, Quélus. The duellists' seconds also became involved, and at the end of the duel three men received mortal wounds, including Quélus.



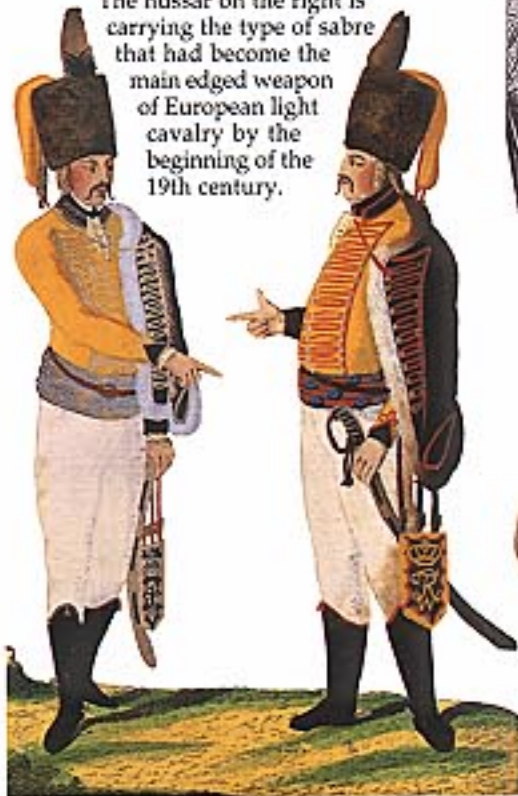
SIX BROADSWORD CUTS
A face on the handkerchief of sword exercises (above), shows the directions of the six cuts that could be aimed at an opponent's head.

BROADSWORD EXERCISES
From the 1600s, broadswords (pp. 44-45), swords with heavy, double-edged blades, were commonly used in European cavalry regiments. These three illustrations showing broadsword exercises, come from an early 19th-century handkerchief.



PRUSSIAN HUSSARS

The hussar on the right is carrying the type of sabre that had become the main edged weapon of European light cavalry by the beginning of the 19th century.



SWORD CUTLER'S SHOP, c. 1755
In a Parisian sword cutler's shop, a customer is testing a new blade, while workmen near the window are making sword hilts.



BACKSWORD, c.1620
A backsword was a type of military sword used by European cavalry in the 17th century for both cutting and thrusting at an opponent in battle.

Guard for protecting hand, similar to that of rapier



ENGLISH SMALLSWORD, c. 1780
Being worn for fashion as well as protection, smallswords (p. 43) often had highly decorated hilts and blades. Civilians wore these swords until the end of the 18th century, by which time they were little more than fashion accessories, called "town" or "walking" swords.

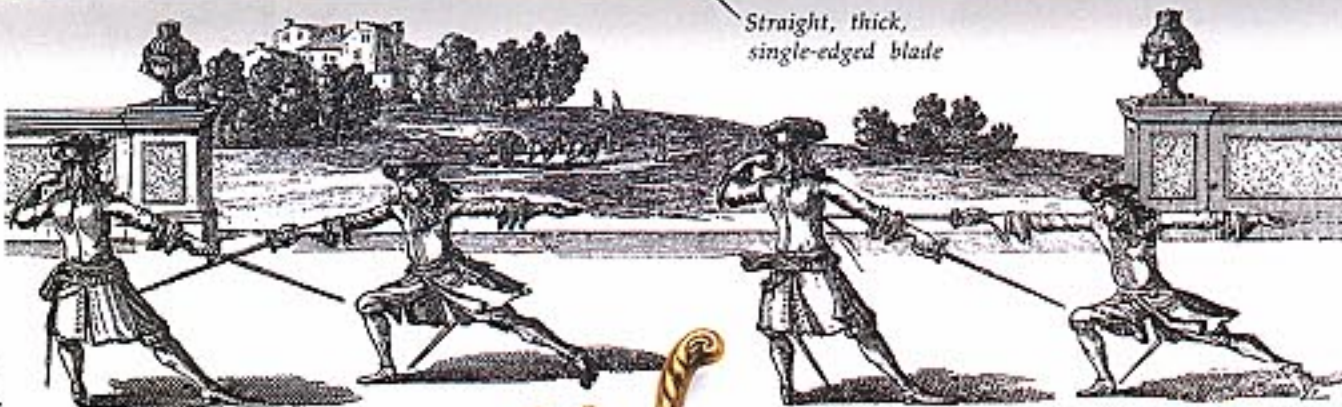
Etched, double-edged blade

Hilt engraved with trophies of arms

Blade of 17th-century parrying dagger (p. 43)



SMALLSWORD EXERCISES, c. 1686
By the end of the 1600s, many fencing masters were teaching new techniques in sword play, such as parrying with the sword blade rather than with a dagger. This illustration of sword exercises comes from a French treatise.



Straight, thick, single-edged blade

Blade of 17th-century rapier (pp. 42-43)



Single-edged and pointed blade, engraved with coat of arms

HUNTING SWORD, c. 1780
Used for hunting rather than personal combat, this short French hanger (pp. 16-17) offers little protection for the user's hand.

Cast brass hilt with recurved quillons and rococo designs

Bone grip stained green



THE BATTLE OF DENAIN left
In this painting of a battle fought in 1712, between the French and an Anglo-Dutch army, the French victor, Marechal de Villars uses his smallsword to rally his men.



Basket hilt completely protected the hand

Running wolf engraving, originally used by well-known German blade-makers

In England broadswords with this decoration were called "mortuary" swords as the heads were said to refer to the executed King Charles I

BROADSWORD c. 1610 below
This type of heavy, double-edged military sword was known as a broadsword. Swords of this type were popular cavalry weapons from the 17th to the 19th century.

BROADSWORD EXERCISE
According to a contemporary book, broadswords (p.43) were "safe, simple, but [needing] a great amount of strength".

16TH-CENTURY HILTS
Far simpler than the rapier hilts designed to protect the hand in duelling, is the hilt of the broadsword used by a Landsknecht, a German foot soldier, in the 1500s.



A Landsknecht's broadsword and hilt



Duelling pistols

ALTHOUGH ILLEGAL, for centuries duelling had been a popular way for "gentlemen" and army officers to settle their quarrels. By the late 18th century, when flintlock pistols were perfected, they had replaced swords (pp. 42-43) as the preferred method of fighting a duel. Gunsmiths began to make special duelling pistols in matched pairs, which they supplied fitted into a case with all the necessary accessories for both making the bullets, and cleaning and loading the pistols. In order that duelling pistols should be as accurate as possible the pistols were of the highest quality, with added refinements such as sights and special triggers. All duelling pistols were muzzle-loaders (pp. 38-39), and until about 1820-30 all used flintlock ignition.

Making a bullet

The lead ball or bullet was made at home by the firer, using a bullet mould provided with the pistol. Lead was melted over a fire and poured into the mould. After a few seconds the scissor-like mould was opened and the ball shaken out. Excess lead or "sprue" was cut off with the shears incorporated into the mould handles.

BULLET MOULD
Bullets were made by pouring melted lead into the hollow chamber of the bullet mould (p. 57).



POWDER FLASK
Gunpowder was kept in a powder flask. Originally made of wood or horn (p. 39), by the 19th century most powder flasks were made of metal. When self-contained cartridges were introduced, powder flasks became obsolete.



RAMROD
A wood or metal ramrod (kept in a recess below the barrel) was used to push the ball and patch down the bore. Many ramrods had special attachments for cleaning out the bore.



ALEKSANDR PUSHKIN
Eminent men who took part in duels included the British general and statesman, the Duke of Wellington, and the French politician Georges Clemenceau. A famous victim was the great Russian writer Pushkin, killed in a duel with his wife's lover in 1837.

SENSITIVE TRIGGER *above*
Many duelling pistols had a special "hair" or "set" trigger, worked by an extra spring in the lock. These light triggers allowed the user to fire the pistol without disturbing his aim.

The butt - rear part of stock

Wooden end for holding ramrod

LINEN PATCH
To fit tightly in the barrel, the bullet was wrapped in a cloth or leather patch.

RAMROD
A wood or metal ramrod (kept in a recess below the barrel) was used to push the ball and patch down the bore. Many ramrods had special attachments for cleaning out the bore.

The grip - part of stock where pistol is held.

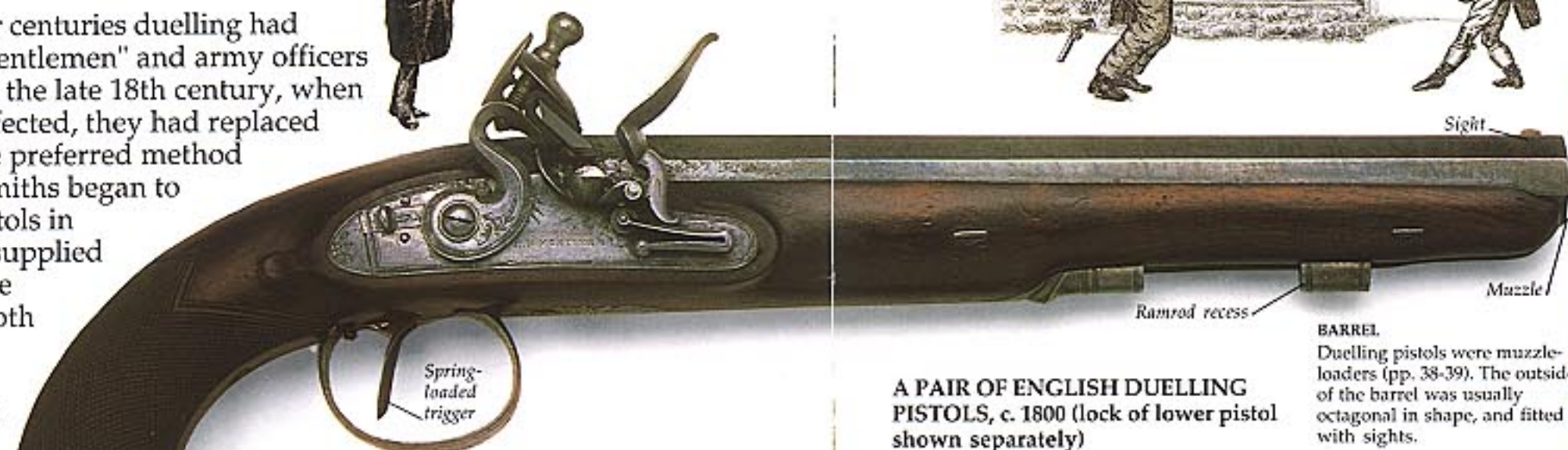
WOODEN STOCK *right*
In all duelling pistols the wooden stock was carefully made so that the butt would fit comfortably in the duellist's hand. Some pistols had a squarer saw-handled butt to assist the grip.

THE END OF THE DUELLING ERA
A French duellist, c. 1887. His opponent is shown far left.



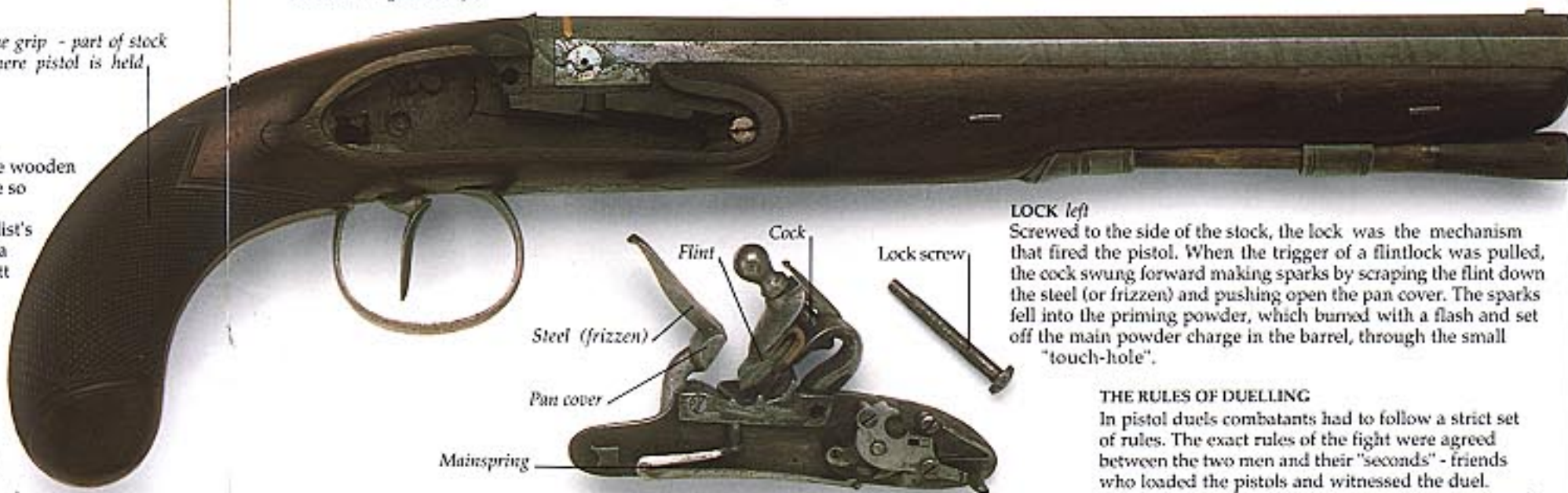
AMERICAN ANTI-DUELLING CARTOON, c. 1821 *left*
When this anti-duelling cartoon was published in Philadelphia, duelling was as popular in America as it was in countries such as France and England.

AN AFFAIR OF HONOUR, c. 1820
Duels were called "affairs of honour". A gentleman who considered himself insulted by the behaviour of another would challenge him to a duel. To refuse to be "called out" cast a bad slur on a gentleman's honour. Robert Cruikshank painted this fatal duel at the height of the duelling era.



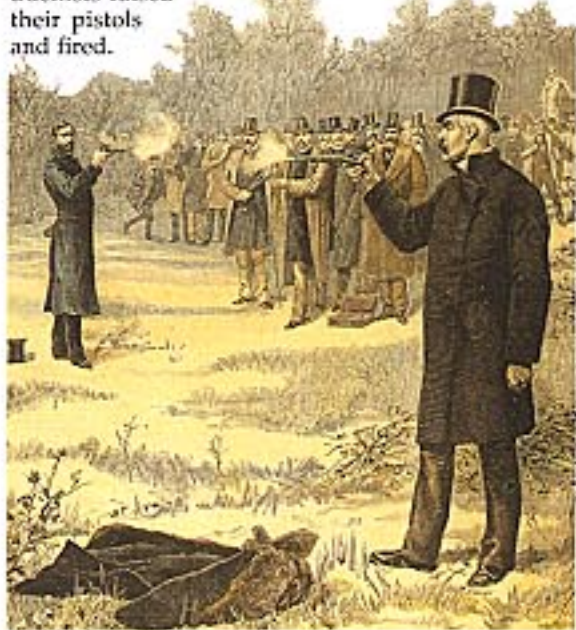
A PAIR OF ENGLISH DUELLING PISTOLS, c. 1800 (lock of lower pistol shown separately)

BARREL
Duelling pistols were muzzle-loaders (pp. 38-39). The outside of the barrel was usually octagonal in shape, and fitted with sights.



LOCK *left*
Screwed to the side of the stock, the lock was the mechanism that fired the pistol. When the trigger of a flintlock was pulled, the cock swung forward making sparks by scraping the flint down the steel (or frizzen) and pushing open the pan cover. The sparks fell into the priming powder, which burned with a flash and set off the main powder charge in the barrel, through the small "touch-hole".

THE RULES OF DUELLING
In pistol duels combatants had to follow a strict set of rules. The exact rules of the fight were agreed between the two men and their "seconds" - friends who loaded the pistols and witnessed the duel. Usually, the two duellists stood an agreed number of paces apart, with their pistols pointing at the ground. At a given signal, such as the dropping of a handkerchief by one of the seconds, the duellists raised their pistols and fired.



A non-fatal duel, fought in France in 1893

Cleaning a flintlock

- 1 Extract any unfired ball and powder from barrel using tool attached to ramrod or special cleaning rod.
- 2 Clean and oil empty barrel with cloth attached to ramrod or cleaning rod.
- 3 Brush away burnt gunpowder in and around priming pan.
- 4 Oil lock.
- 5 Replace flint if worn out.



TURNSCREW
A turn screw was used for removing the lock.



PAN BRUSH
The priming pan needed frequent cleaning.



OIL CAN
for oiling lock and barrel

FLINTS AND LEATHERS
Leather was used to grip the flint in the jaws of the lock.



Spare leather

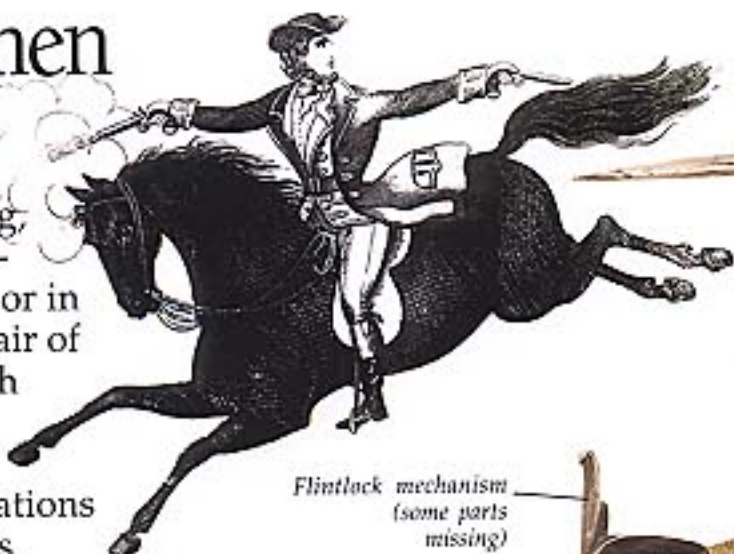
Attack by highwaymen



IN THE LAWLESS days before guns were subject to licensing, many firearms were made or adapted for self-defence against armed robbers, either on the road or in the home. A gentleman on horseback could carry a pair of holster pistols on his saddle; when travelling by coach he could keep a small pistol in his coat pocket, or he or the coach's guard could carry a blunderbuss. The blunderbuss was well suited to close-range confrontations and was used to defend ships as well as travellers. Its wide muzzle helped intimidate an opponent and, if that failed to deter, its charge of numerous lead balls gave its nervous owner a better chance of hitting the target. Blunderbusses were often fitted with spring bayonets for additional protection, and pistols butts could also be used as clubs. Inevitably, such weapons were equally suited to a robber's needs.



FOOTPADS ATTACKING A TRAVELLER
This 1813 cartoon by Thomas Rowlandson shows a traveller being held up by three footpads, armed with pistols.



DICK TURPIN
During the 1730s Dick Turpin, the legendary highwayman, was the most wanted man in England. Here Turpin is shown improbably firing two pistols in opposite directions, whilst jumping a toll-gate on his famous horse Black Bess.

Flintlock mechanism (some parts missing)

Partially opened spring bayonet

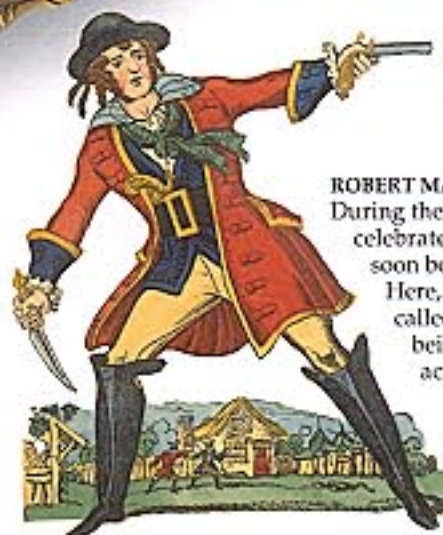
Bayonet spring and lock

Brass barrel

Ramrod

Bayonet catch

TRICORNE HAT
A three-cornered or tricorne hat would have been worn by the more respectable 18th-century highwaymen.



ROBERT MACAIRE
During the 18th century celebrated highwaymen soon became folk heroes. Here, a notorious robber called Robert Macaire is being portrayed by an actor called Mr Hicks.

FLINTLOCK BLUNDERBUSS
Blunderbusses fired a number of small shot for close-range effect. This late 18th-century blunderbuss has a spring-loaded bayonet - on releasing the catch the bayonet would flip forward and lock in position.

Ramrod

Two brass barrels side-by-side

Flintlock mechanism of box-lock type

HOLSTER PISTOL
The butt-cap of this early 18th-century holster pistol allowed the pistol to be reversed and used as a club once the single shot had been fired.

Brass mounted

Butt-cap

Silver butt-cap

POCKET PISTOL
With a double-barrelled pistol, both barrels were fired by the same lock. The iron slider on the box-like frame selected which barrel was connected with the flash pan. This particular pocket pistol was made in London, c. 1785.



AN ATTACK BY HIGHWAYMEN
In 1750 two highwaymen robbed Lord Eglinton, who was riding in his post-chaise near London. On this occasion the blunderbuss his lordship is holding proved useless.

Bizarre handweapons

THROUGHOUT recorded history extraordinary and seemingly impractical weapons have been made alongside conventional swords, guns, and bows and arrows. The unusual weapons shown on these pages prove that many local and tribal weapons were just as ingenious and deadly as the specialist weapons devised for close-range attack and defence, or the strange-looking combination pistols made by gunsmiths for their rich customers.



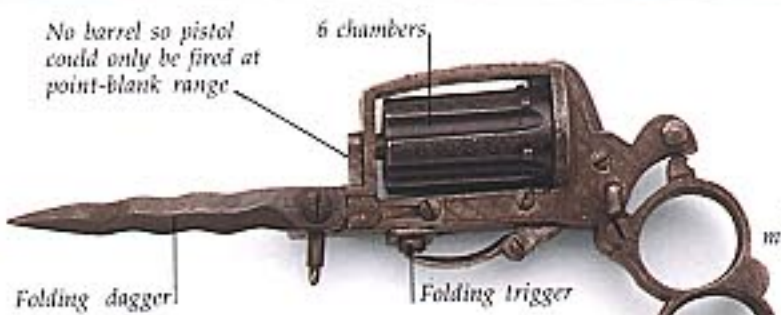
INDIAN MACE right
This all-steel mace was made in India in the 19th century. The owner would have used the mace to lean on whilst he was sitting down but could have quickly clubbed any possible assailant with the metal "hand".

ITALIAN GUNNER'S STILETTO below
The engraving on the blade of this 18th-century dagger is a numbered scale for artillery commanders to calculate the bore size of cannons.



Engraved blade

APACHE PISTOL right
Around 1900 a gang of Parisian criminals called themselves Apaches after the warlike tribe of North American Indians. The gang used specially made pinfire revolvers which had a folding blade and knuckle-duster butt.



No barrel so pistol could only be fired at point-blank range

6 chambers

Folding dagger

Folding trigger

End of grip inserted into musket muzzle

Knuckle-duster forms butt

Turned ivory grip with picket work

BOY'S SWORD below
In the 18th century, wealthy parents presented special small swords to their sons when they left the nursery and wore breeches for the first time.



Numbered scale on flat of blade

Sharp point for thrusting

Miniature version of classic small sword (pp. 44-45)

THE LAST ARMOUR below
In the 1700s and 1800s the only piece of armour regularly worn by European or American armies was the gorget (p. 26), worn as a mark of rank for officers rather than for defense. Today gorgets are still used with full dress in some countries. This particular gorget (below) belonged to an officer of the marines in the British navy, c. 1800.

Gorget



Dagger blade

Made of wrought steel

Originally screwed into short "stick" concealing the blade, making it harmless to lean upon



WAR FLAILS left
Adapted from grain-threshing tools, a war flail was used against armour in the Middle Ages. It consisted of a shaft with a chain, ending in an iron ball or a wooden ball studded with spikes.

INDIAN STEEL DAGGER
An Indian dagger that forms part of an unusual steel weapon used by Hindu holy men and known as a fakir's crutch. The complete weapon is called a "crutch" because the fakir could lean on it when seated.



Scroll handle ending in a lotus flower

PLUG BAYONET
Early bayonets, dating from about 1650, were knives or daggers inserted in the muzzle of a musket for use as a secondary weapon. Plug bayonets were replaced by socket bayonets in about 1700 (p. 40).



"CROW'S FEET" left
An ancient antipersonnel device, caltrops or "crow's feet" are made of four or more sharp iron spikes. They were strewn in front of horse's hooves or infantrymen's feet.



Trigger

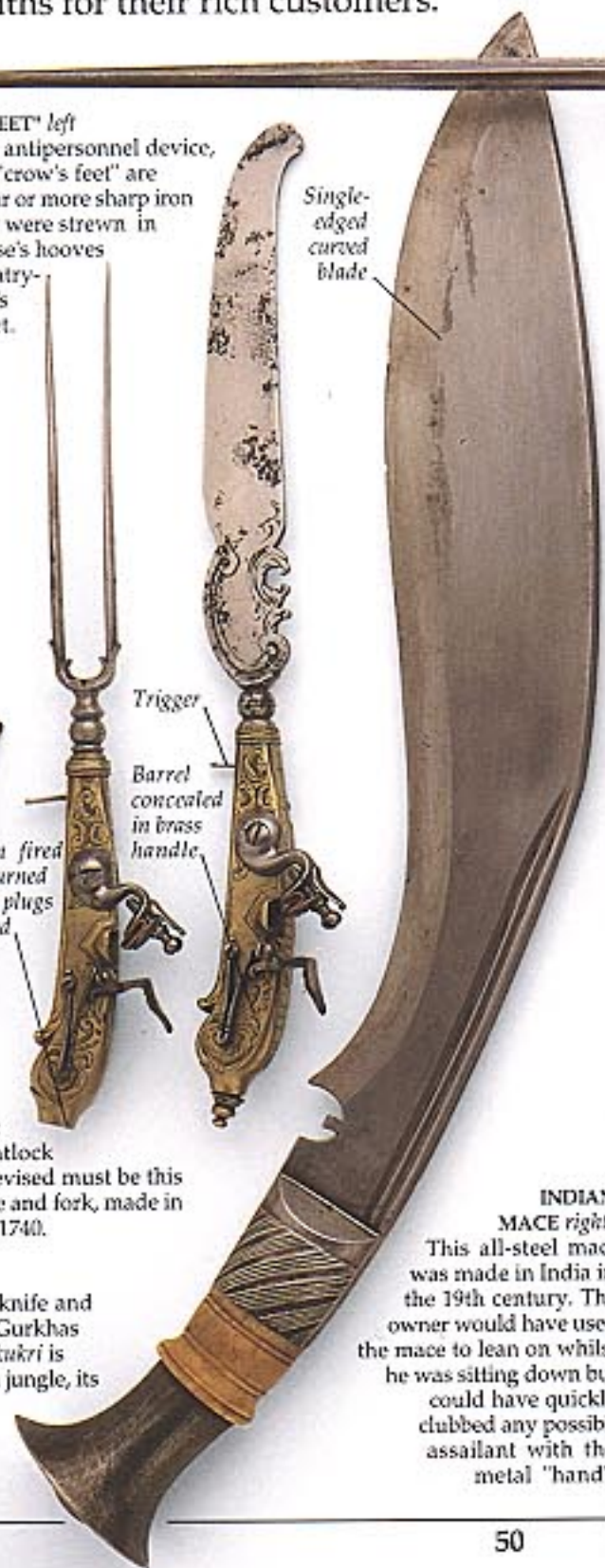
Barrel concealed in brass handle

Weapon fired when turned muzzle plugs removed

CUTLERY PISTOLS right
Among the most impractical flintlock firearms ever devised must be this companion knife and fork, made in Germany about 1740.



GURKHA KNIFE right
The *kukri* is the national knife and principal weapon of the Gurkhas of Nepal. Although the *kukri* is useful for cutting through jungle, its heavy, curved blade also makes it a deadly fighting weapon.



Single-edged curved blade



FAKIR'S HORNS above
This unusual-looking Indian weapon, known as fakir's horns, is a double-ended dagger with horn grips. It was used as a defensive weapon by fakirs, Hindu holy men who were not allowed to carry ordinary weapons.

Steel spikes on end of horns

Black buck horns

MIDSHIPMAN'S DIRK below
This type of hanger (pp. 16-17) or dirk was worn by young naval officers in the 19th century. As each officer had his own weapon specially made before he joined his ship, these weapons are often highly individualistic.



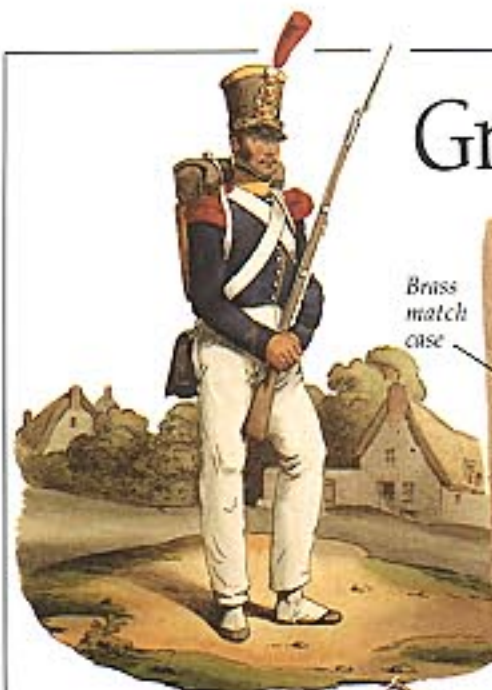
Lion's head pommel

Ivory grip

Single-edged curved blade

Grenadiers and cavalry

BY THE TIME Napoleon Bonaparte was conquering most of Europe, at the beginning of the 1800s, flintlock firearms - muskets, carbines and pistols - had become the chief weapons of armies in both Europe and North America (pp. 40-41). Among the specialist flintlocks were grenade launchers - weapons for destroying defensive works such as doorways and barricades. Originally grenades were used by specially trained troops called grenadiers. But by the 19th century most so-called grenadiers were ordinary infantry corps who used flintlock muskets rather than grenades. In the Napoleonic wars muskets proved such formidable weapons that they often destroyed the effectiveness of mounted troops, who relied more on swords and lances than firearms.



FRENCH GRENADIER
Despite his title, the main weapon of this soldier in the French Light Infantry was his flintlock musket.

GRENADIER'S POUCH AND BELT
An 18th-century English grenadier's pouch decorated with a one-legged grenadier. Grenadiers of this period wore special pointed caps to enable them to throw grenades overarm.



Velvet pouch
Grenade
Grenade pouch
Live grenade
Buff leather belt



Brass match case

Brush for removing excess gunpowder



Iron case
Charge hole
Fuse
Early hand grenade

Lighted match



SOLDIER LIGHTING GRENADE left
By the late 1600s small bombs known as hand grenades were commonly used in European battles. Early grenades were hollow iron balls filled with black gunpowder. Holes were bored through the wall of the grenade (below left) and threaded with a short fuse.

GRENADIE LAUNCHER
This formidable looking weapon, designed to increase the range of grenades, first appeared in the 16th century. Any miscalculation over the lighting of the grenade fuse was liable to cause fatal injuries to the grenadier and anybody nearby.



40 cm (16 ins) long barrel

Fleur-de-lys

CAVALRY SWORD
Late 18th-century French sabre with a brass hilt decorated with a fleur-de-lys, the royal emblem of France. The sword has a single-edged, straight blade.

BRITISH OFFICER'S SHAKO, EARLY 19TH CENTURY

Basket hilt protects the entire hand

Napoleon Bonaparte in 1812

Engraving reads Pro Deo fide et Patria - "For God, Faith and Country"

CUIRASSIER'S SWORD
French sabre with the gilded brass hilt and slightly curved blade of the type used by cuirassier or heavy cavalry regiments in Napoleon's army.



53

CAVALRY CHARGE
At the Battle of Waterloo in 1815 a series of classic encounters took place as the French light cavalry charged the British infantry squares. While one line of the square fired a volley, another line reloaded. In this battle the inability of the French cavalry to break through these squares proved decisive.



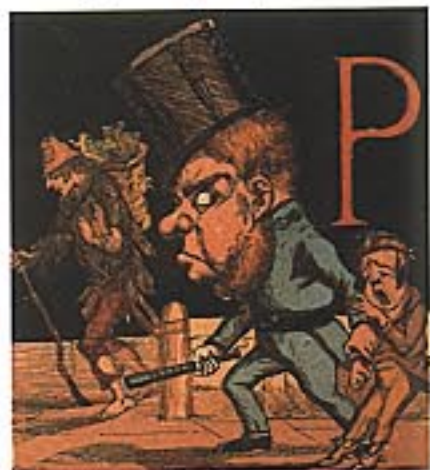
OFFICER'S SHAKO
In the 1800s shakos, stiff peaked caps, were worn in many armies (also top of opposite page).

Keeping law and order



LONDON POLICEMAN
A late 19th-century policeman goes on night patrol with just a truncheon and a lamp.

Of course, more powerful weapons were issued to some police forces of necessity - by the late 19th century the Berlin police were armed with swords, pistols and brass knuckles, and the police in American cities such as New York and Boston first used firearms during the 1850s - but in most European and American towns the increasing respect felt for the ordinary civilian law-enforcement officer was due in part to his being so lightly armed.

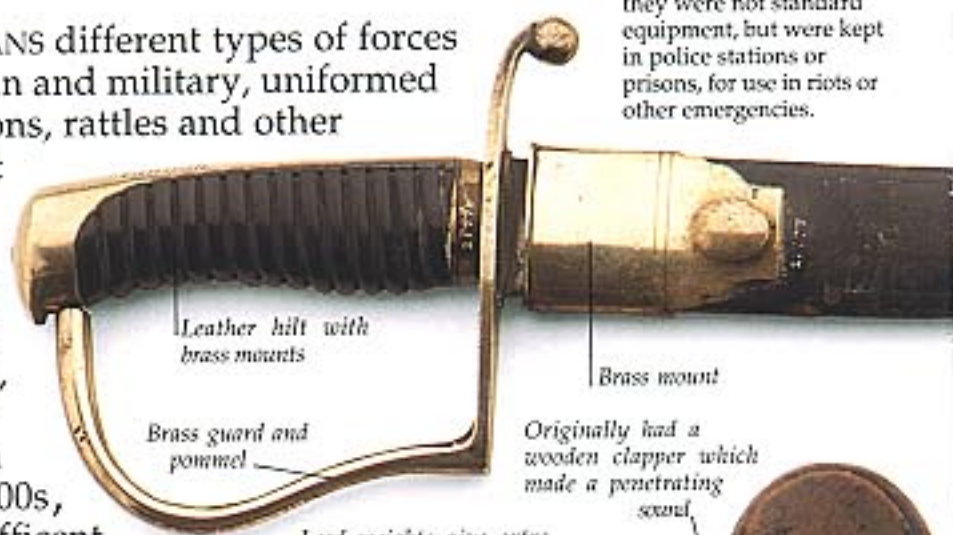


PICTURE BOOK POLICEMAN
The fact that images of 19th-century policemen were often used to frighten children into behaving properly is well illustrated by this picture of a policeman in a child's gift book, dating from 1867.

POLICE WHISTLE right
Whistles were adopted in many police forces during the 19th century when it was found that they could be heard over far greater distances than the sound from a rattle.

SINCE THE WORD "POLICE" MEANS different types of forces in different countries - civilian and military, uniformed and plain-clothed - the batons, rattles and other law-enforcement equipment shown on these pages are best described as weapons for combatting crime and keeping public order. All of them were in use during the 19th century, and when it is considered how much violent crime and civilian unrest took place during the 1800s, these weapons seem hardly sufficient.

Of course, more powerful weapons were issued to some police forces of necessity - by the late 19th century the Berlin police were armed with



POLICE SWORD below
Short swords were issued to 19th-century police forces and to prison guards. In Britain they were not standard equipment, but were kept in police stations or prisons, for use in riots or other emergencies.

Leather hilt with brass mounts
Brass guard and pommel

Brass mount

Originally had a wooden clapper which made a penetrating sound

Lead weights give extra weight when swung



POLICE RATTLES
Lead weights in a rattle (above) made it a useful weapon as well as giving it extra weight when it was swung. Rattles with clappers (right) made an especially loud noise.



LEATHER COLLAR

In some early police forces officers wore leather collars called stocks to protect them from being garrotted - strangled with a cord. Stocks were both hot and restrictive to wear.

BULLSEYE LANTERN

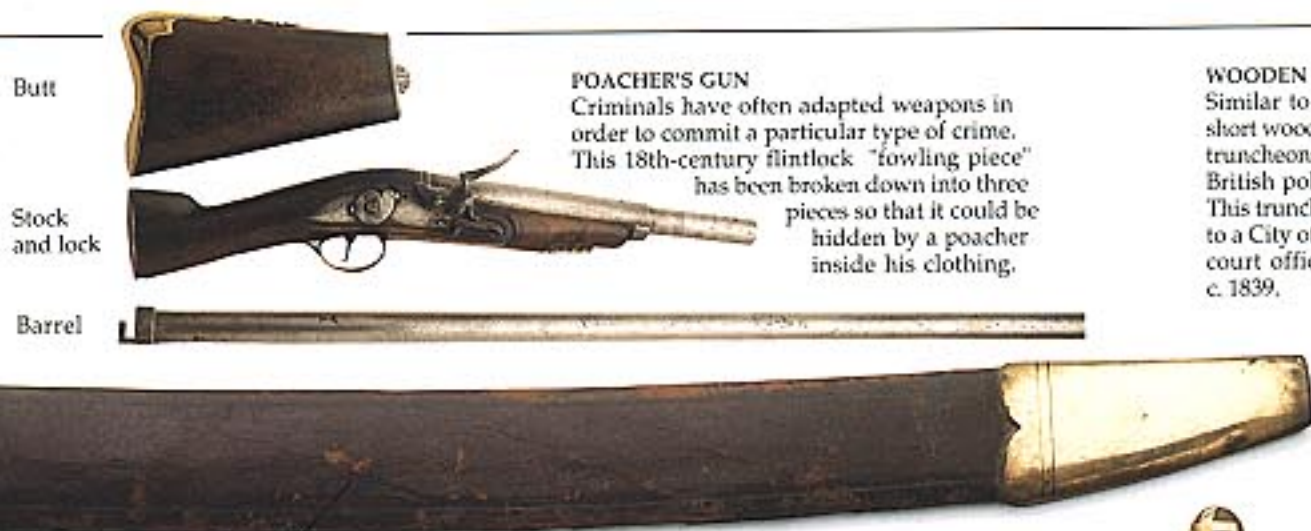
The standard British police lamp in the 19th century, the bullseye lantern hooked onto the belt the policeman wore over his great coat.



Stock is 10 cm (4 ins) wide

Ground glass magnifying lens

Twin handles



Butt

Stock and lock

Barrel

POACHER'S GUN

Criminals have often adapted weapons in order to commit a particular type of crime. This 18th-century flintlock "fowling piece" has been broken down into three pieces so that it could be hidden by a poacher inside his clothing.

WOODEN TRUNCHEON below
Similar to the American night stick, short wooden batons known as truncheons have been carried by British policemen since the 1820s. This truncheon belonged to a City of London court official, c. 1839.

Curved single-edged blade in leather scabbard



HANDCUFFS below
Replacing the chains and manacles of earlier days, handcuffs were a vital piece of equipment for any 19th-century police officer.

Silver shaft surmounted by crown

City of London coat of arms

SERGEANT DE VILLE right
A French civilian policeman or *sergent de ville* in 1850. *Sergents de villes* wore blue uniforms and bicorne hats and, like many early police forces, carried short swords as standard equipment.



TIPSTAFF, c.1750
This ceremonial club or tipstaff was only carried as a symbol of authority.

THE EARLIEST POLICEMEN below
The first modern police force was set up in London in 1829 by Sir Robert Peel. These early "peelers" or "bobbies" were mistrusted by the public and often ridiculed by contemporary cartoonists.



SINGLE HANDCUFF
This small handcuff was only used for taking a prisoner short distances.



Handle twisted to lock handcuff

Ebony handle

PRISON HANDCUFFS
Handcuffs like these were used for moving convicts within prisons.



Key always kept in lock

British police whistle, 1884 model

Tipstaff of a private constable in one of the City of London Companies, c. 1820 (above)

The percussion revolver

PERCUSSION IGNITION WAS A VITAL DEVELOPMENT in the history of firearms. In the early 19th century it offered instantaneous ignition and greatly improved resistance to wet weather. In its most common form a thimble-cap containing detonating compound was placed on a steel nipple. When struck by the weapon's hammer the cap exploded, sending a jet of flame through the nipple into the powder charge. Early percussion guns were still muzzle-loaders (pp. 38-39), with the cap separate from the powder and ball. Later, the cap was incorporated in the base of a self-contained metallic cartridge, with the powder and ball. The metal case sealed in the explosive gases, allowing efficient breech-loading designs that are still in world-wide use today.



SHERLOCK HOLMES
An actor portraying the most famous detective in literature, Sherlock Holmes, is shown holding a smoking percussion pistol.

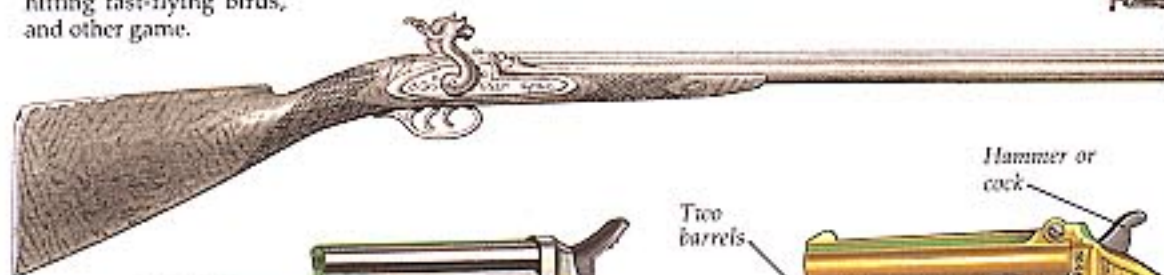
PERCUSSION REVOLVER
A percussion revolver, c.1855, made by the English gunmaker William Tranter. This self-cocking double-action design could be used with one hand. Pulling the lower trigger turned the cylinder and cocked the hammer; pulling the upper trigger fired the shot.

INDIAN MUTINY, 1857
In the kind of hand-to-hand fighting that took place in the Indian Mutiny, British officers preferred self-cocking revolvers (like the Tranter), for rapid firing.

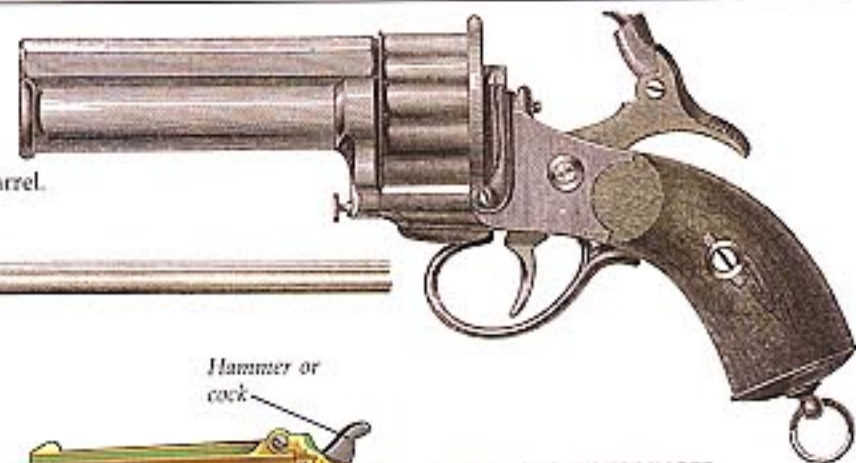
BAG OF CARTRIDGES
To load the revolver, the copper cover was removed from the paper sachet of powder attached to the bullet, and the cartridge was loaded into the front of the revolver cylinder. The revolver would have been equipped with a detachable rammer.



PERCUSSION SHOTGUN
An artist's impression of a percussion shotgun, c.1850. Percussion ignition greatly improved the sportsman's chances of hitting fast-flying birds, and other game.



LE MAT REVOLVER
Invented by a French resident of the USA, this heavy revolver had a cylinder which revolved round a central shotgun barrel.



SHARPS DERRINGER
An improvement on the original Deringer which was a percussion muzzle-loader, this "Deringer" was a four-barrelled pistol firing small calibre cartridges.



REMINGTON DERRINGER
Another type of pocket pistol modelled on the original percussion Deringer was this two-shot Remington, which fired a metallic cartridge.

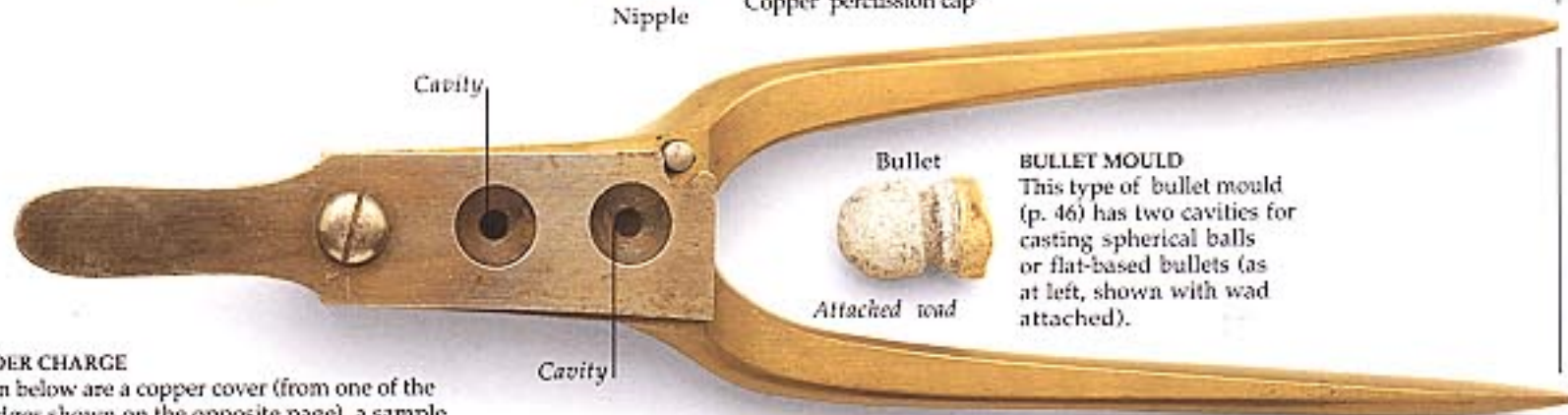


Gold koftgari decoration added in India



Lead bullet with grease in groove and wad at base

NIPPLE AND WRENCH
The nipples, the most vital part of a percussion weapon, were removed by means of the wrench for cleaning. A nipple screwed into the revolver to link the flash of the percussion cap to the propellant.



BULLET MOULD
This type of bullet mould (p. 46) has two cavities for casting spherical balls or flat-based bullets (as at left, shown with wad attached).

POWDER CHARGE
Shown below are a copper cover (from one of the cartridges shown on the opposite page), a sample of gunpowder, and a powder flask. If cartridges were unavailable, a percussion revolver like the Tranter could be loaded with powder from the flask and a loose bullet. Powder flasks became obsolete when self-contained cartridges arrived.

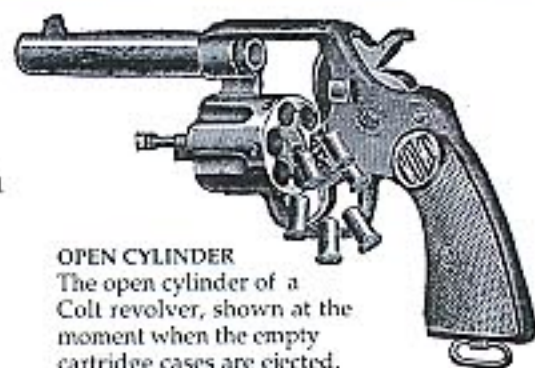
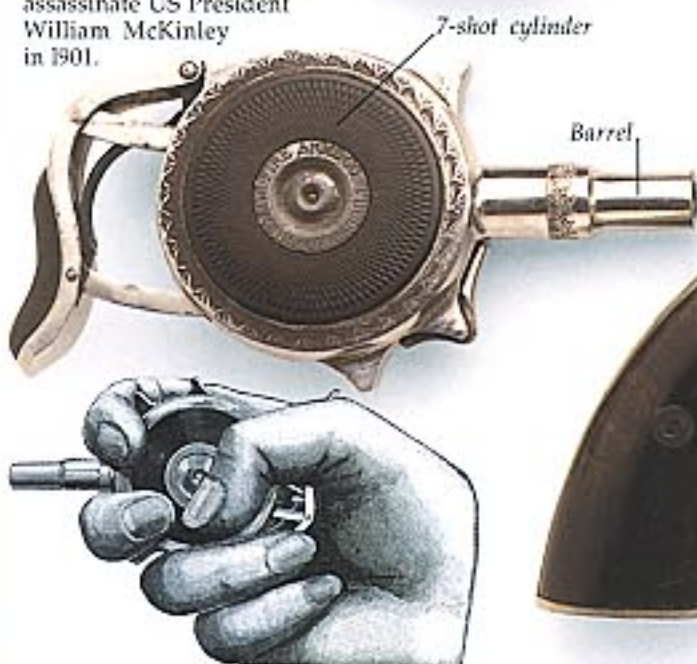


Pistols

A PISTOL IS SIMPLY a short-barrelled firearm designed to be used with one hand - a convenient weapon to carry, but needing much practice to fire accurately. During the 19th century a great variety of pistols were designed for both military and civilian use. Some could fire only a single shot but others - called revolvers - could fire a succession of shots before they needed reloading.

COSSACK PISTOL
A pistol from the Caucasus in southern Russia with a miquelet lock - a type of flintlock used mainly in Spain and the Middle East. The Cossacks used similar pistols in the 18th and 19th century.

ASSASSIN'S PISTOL below
This unusual revolver, known as a palm pistol or "lemon squeezer", was held almost hidden in the hand, and fired by a squeezing action. One was used to assassinate US President William McKinley in 1901.

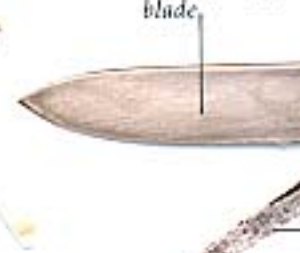


OPEN CYLINDER
The open cylinder of a Colt revolver, shown at the moment when the empty cartridge cases are ejected, before reloading.

Bullet mould for combination pistol



Folding dagger blade



Folding pocket knife blade



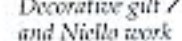
Pistol barrel

COMBINATION PISTOL
A popular weapon of the 1840s and 50s was the combined pistol and pocket knife. This example includes a pistol, two knife blades, a ramrod, and space in the grip for ammunition.



Hollow grip for ammunition and bullet mould

Decorative gilt and Niello work



Special 12 in (305 mm) barrel

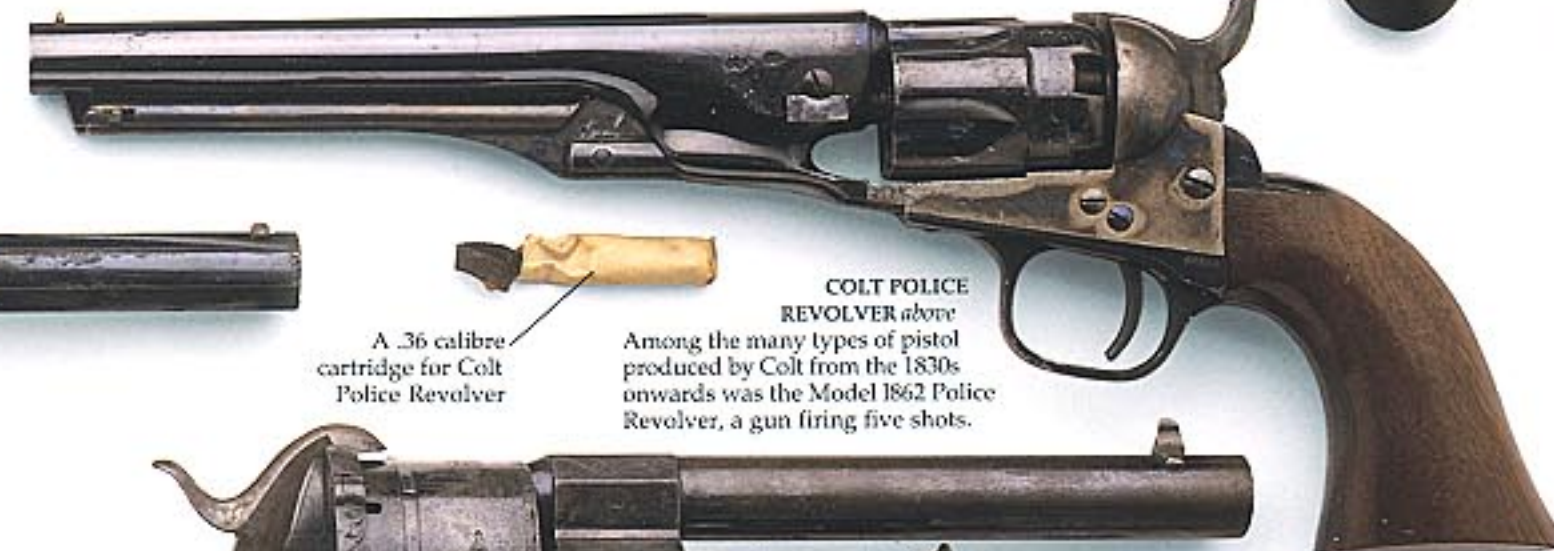


Ramrod

POCKET OR MUFF PISTOL
This percussion pistol, c. 1850, was kept in a man's pocket or a lady's muff. Its trigger folded into the pistol when not in use.



"BUNTLINE SPECIAL" REVOLVER above
This long-barrelled version of the Colt Peacemaker (p. 61) was made famous by the 19th-century American writer Ned Buntline, author of over 400 action novels.



COLT POLICE REVOLVER above
Among the many types of pistol produced by Colt from the 1830s onwards was the Model 1862 Police Revolver, a gun firing five shots.

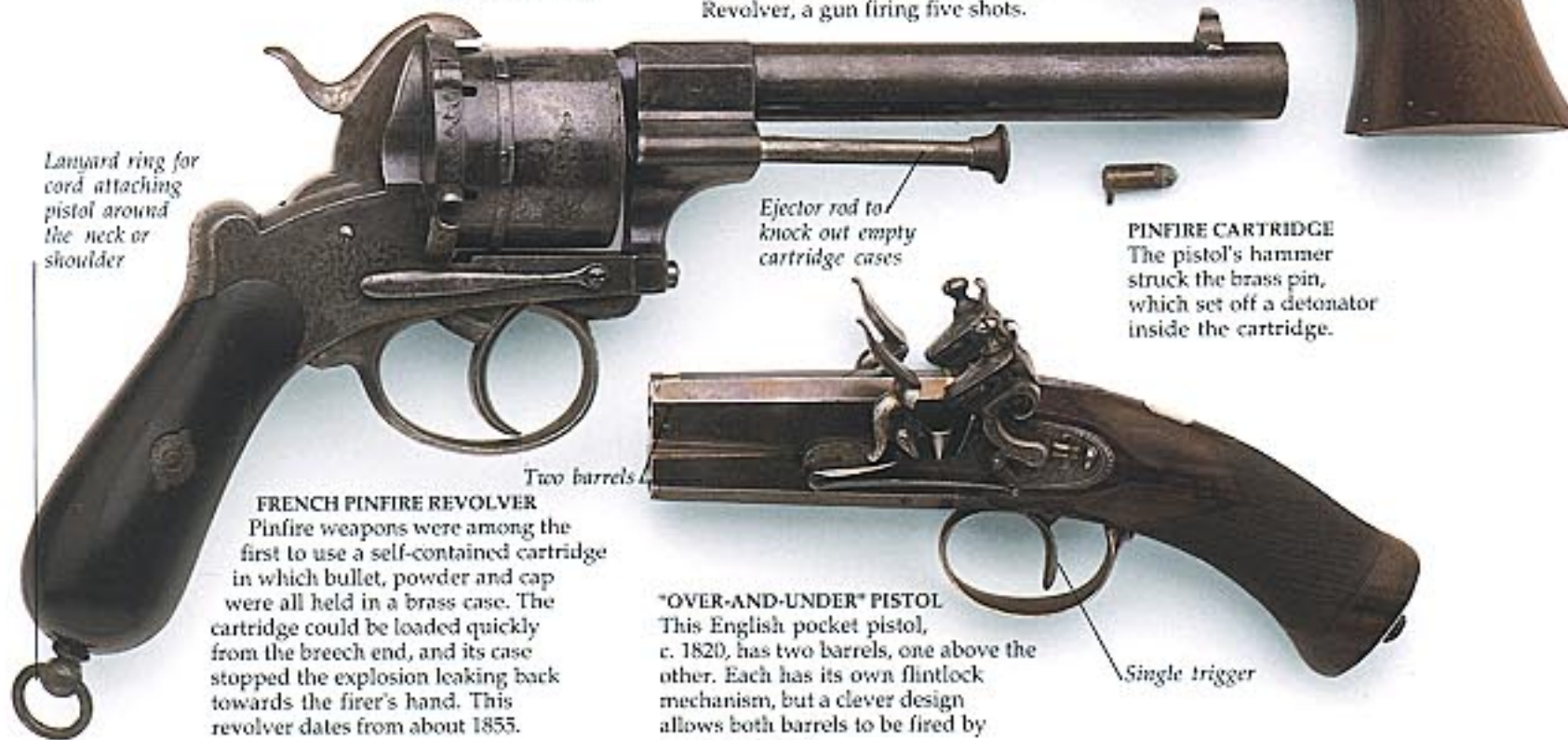
A .36 calibre cartridge for Colt Police Revolver



TRANSITIONAL REVOLVER above
Representing the "transition" between the pepperbox and the true revolver, this weapon was cheap and popular during the 1850s.



Lanyard ring for cord attaching pistol around the neck or shoulder



Ejector rod to knock out empty cartridge cases

PINFIRE CARTRIDGE
The pistol's hammer struck the brass pin, which set off a detonator inside the cartridge.

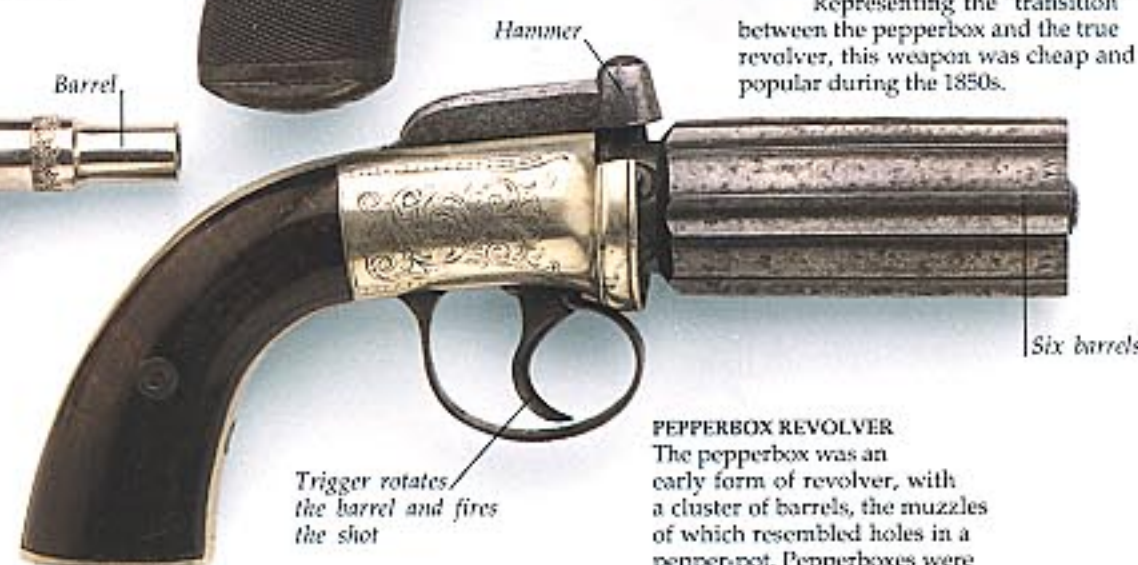
FRENCH PINFIRE REVOLVER
Pinfire weapons were among the first to use a self-contained cartridge in which bullet, powder and cap were all held in a brass case. The cartridge could be loaded quickly from the breech end, and its case stopped the explosion leaking back towards the firer's hand. This revolver dates from about 1855.

"OVER-AND-UNDER" PISTOL
This English pocket pistol, c. 1820, has two barrels, one above the other. Each has its own flintlock mechanism, but a clever design allows both barrels to be fired by just one trigger.

Single trigger

Trigger rotates the barrel and fires the shot

PEPPERBOX REVOLVER
The pepperbox was an early form of revolver, with a cluster of barrels, the muzzles of which resembled holes in a pepper-pot. Pepperboxes were popular between 1830 and 1860, despite their unreliability.



Guns that won the West

THE WESTWARD EXPANSION of the United States in the 19th century coincided with a period of rapid development in firearms, and the new arms were exploited alike by settlers, cowboys, the American Army, Indians and outlaws. The most popular weapons were revolvers such as those made by Samuel Colt, and repeating rifles such as the Winchester, which were light enough for use as a carbine on horseback, and more accurate than a revolver at longer ranges on the open plains.

Buffalo Bill, holding a Winchester '73, with the Sioux chief Sitting Bull



Iron butt-plate

Walnut stock

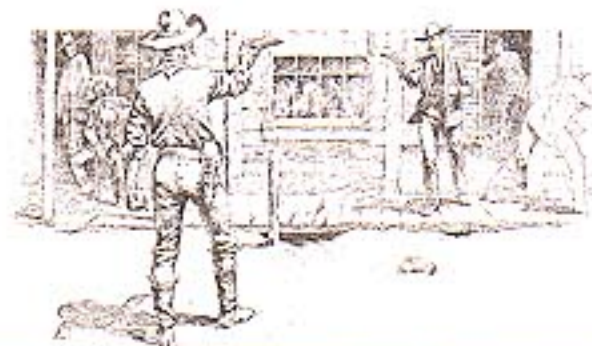
Belt loop

GUNBELT AND HOLSTER
This much-used 19th-century gunbelt and holster is similar to the one worn by the US cavalry officer in campaign dress, drawn by Frederic Remington (inset). Note the spare cartridges in the belt loops.



Lever incorporated with trigger guard pushed forward and back between shots

Spare cartridge



"A FIGHT IN THE STREET"
Remington drew this scene of two men exchanging shots outside a Western saloon for a magazine in 1888.

WINCHESTER MODEL 1873
Often called "the gun that won the West", this is the legendary repeating rifle. Cartridges were fed through the loading gate on the side of the barrel, into the magazine below the action, into the magazine below the action, into the magazine below the action. Working the lever between shots ejected the empty case and fed a fresh cartridge into the breech.

Steel barrel

Hammer

Loading gate

44-40 CARTRIDGE left
Many Winchester rifles and Colt revolvers fired this popular cartridge so that users needed only one type of ammunition. The calibre is .44 inch, and 40 refers to the charge of 40 grains of powder.

Steel-tube magazine fitted underneath barrel (inside wooden fore end)



7.5in (190mm) barrel length

Lever

Hammer

Cylinder

Ejector tube

Trigger guard

Loading gate

SMITH AND WESSON REVOLVER right
An illustration showing the break-open action of this type of revolver, which automatically ejected the empty cartridge cases when opened.

COLT PEACEMAKER
The Colt Single-Action Army revolver, often called the Peacemaker or Frontier revolver, is the most popular gun ever made. This Cavalry model has the longest barrel - 7.5 in (190 mm).

Ejector

Fitted with target sight for sharpshooters rather than round blade found on service revolvers

Trigger

Vulcanite (early form of plastic) grips

COLT NO 3 DERRINGER
Pocket pistols had proved popular ever since Henry Deringer's percussion pistols (p. 57), and a gambler could easily slip a small pistol like this .41 calibre Colt into a pocket for use in self-defence.

Single-shot weapon

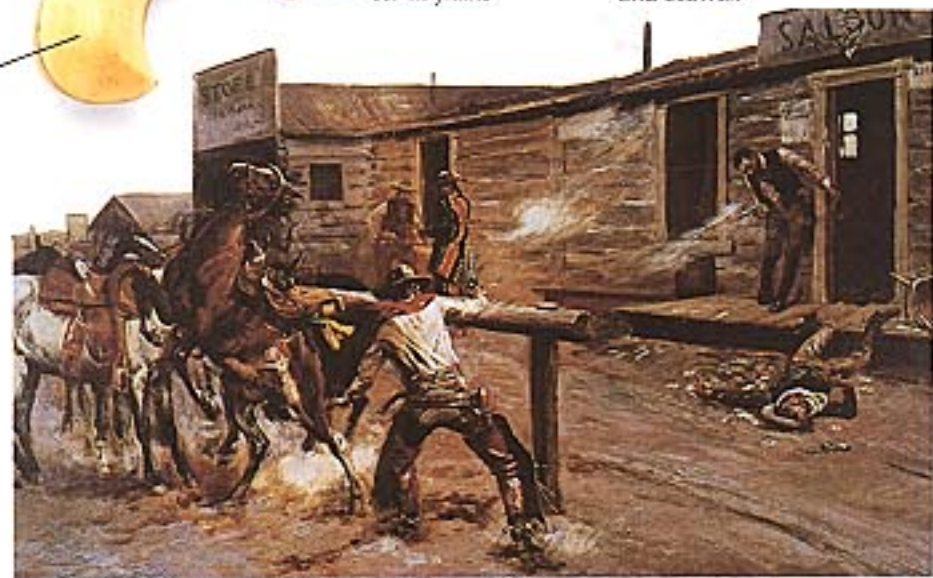
Sheathed trigger set in frame

"GUNFIGHT" below
This painting of a gunfight by Charles Russell illustrates the part that Colt revolvers played in Western quarrels and brawls.

Ivory butt



"THE FLIGHT" left
The weapons of 19th-century cowboys, Indians, soldiers and frontiersmen are authentically depicted in the drawings of the contemporary American artist Frederic Remington.



North American Indians

WRONGLY CALLED *Indios* by Christopher Columbus, the native inhabitants of North America once totalled between one and two million people. However, between 1492 and 1900 the Indian tribes were decimated, as European settlers enforced their own way of life on the woodlands and prairies. After initial peaceful contacts with white traders, the tribes who fought hardest to prevent the white man's takeover of their lands in the

1800s, were those who lived on the Great Plains and in the Southwest. The Plains Indians lived in the central grasslands, where the more nomadic tribes among them hunted the great herds of buffalo that crossed the prairies. Other Indian tribes

such as the Apaches, fierce warriors from the Southwest, lived more sedentary lives. Before they obtained European rifles, the tribes in both these areas used basically the same weapons - bows and arrows (p. 9), knives (pp. 22-23), clubs, and the weapon most strongly associated with the North American Indian, the tomahawk.

HIAWATHA
An Ojibwa Indian, Hiawatha was the hero of a long narrative poem, written in 1855 by Henry Longfellow. In it, Hiawatha becomes leader of his people, and teaches peace with the white man.

WAR BOW, c. 1850
Until they began to acquire rifles in the 1850s and 60s, Plains Indians' bows were their most important weapons, used for both hunting and warfare. Made of ash, this bow belonged to an Omaha warrior.

BOW CASE AND QUIVER
For easier carrying on horseback, a Plains Indian had a combined quiver and bow case. Bow accessories were usually made of buckskin or deerskin.



BUFFALO HUNTING
George Catlin spent six years among the Plains Indians, recording their way of life in the early 1800s. In this painting, Indians are involved in their primary hunting task of killing buffalo.

EAGLE FEATHER HEAD-DRESS left
The eagle feather head-dress, worn in this photograph of 1907 by Iron Plume, a Plains Indian chieftain, was seen only on ceremonial and celebratory occasions.

TOMAHAWK PIPE, c. 1890
This pipe tomahawk was supposedly made by the great Apache chief Geronimo, during his exile in Florida.

Tomahawk blade
Iron tobacco bowl

ARROWS below
A Plains Indian's arrow heads would have been made from buffalo bones. In other regions, Indians made stone arrowheads.

Feathered flights
Wooden shafts - frequently painted with symbolic designs

Finely-honed stone blade

STONE-BLADED KNIFE
All Indians owned knives - this one was made in 1900 by a Hupa Indian from California. By 1900, many Indians had steel-bladed knives.

Buckskin grip

Feather decoration

Cloth strips bound with buckskin

Quiver made of buckskin

Bow made of ash

Notch or groove for attachment of bowstring

QUIVER

BOW CASE

An Indian with a war club fights another wielding a tomahawk

Engraving, c. 1800, on blade shows Indian threatening a European

Iron tobacco bowl

Hollow handle

APACHE TOMAHAWK PIPE
Before European traders supplied the Indians with iron, they made their tomahawk heads with stone. The type of tomahawk that combined an axe blade with a tobacco bowl was usually made by Europeans for trading with the Indians.

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 Illustrations on p. 6 by Coral Mula.

Dorling Kindersley would like to
 thank:
 City of London Police: pp. 54-55;
 also Police Constable Ray Hayler
 for his assistance.
 Pitt Rivers Museum, University of
 Oxford, Oxford; pp. 4-5, 22-23,
 32-33, 36-37; also John Todd for
 his assistance.
 Ermine Street Guard: pp. 1, 12-13;
 also Nicholas Fuentes for his
 assistance.
 Museum of London: pp. 6-7, 12bl,
 10-11, 14-15; also Nick Merriman,
 Peter Stoll and Gavin Morgan
 for their assistance.
 Museum of Mankind, British
 Museum: pp. 8-9, 62-63.
 National Army Museum: pp. 56-57;
 also Stephen Bull for his
 assistance.
 Warwick Castle, Warwick: pp. 16-
 17, 24-25, 26-27, 28-29, 30-31, 38-
 39, 40-41, 42-43, 44-45, 48-49, 52-
 53, 55t; also F.H.P. Barker for his
 assistance.
 Robin Wigington, Arbour Antiques,
 Ltd., Stratford-upon-Avon: pp. 2-
 3, 18-19, 20-21, 34-35, 38b, 50-51,
 58-59, 60-61.
 Anne-Marie Bulat for her work on
 the initial stages of the book.
 Martyn Foote for design assistance.
 Fred Ford and Mike Pilley of
 Radius Graphics, and Ray Owen
 and Nick Madren for artwork.
 Jonathan Buckley for his assistance
 on the photographic sessions.