THE NEW GALLERIES OF ORIENTAL ARMS AND ARMOR

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The Metropolitan Museum of Art has one of the most impressive concentrations of metalwork in the world, and there are few places where one could make a comparative study of artistic metalwork of all times and all places to better advantage. An important segment of this material may be seen in the new installation of selected examples of oriental arms and armor in Wing Z, adjacent to the Morgan Wing, where the European arms and armor are exhibited. This exhibition, which covers the Near, Middle, and Far East, makes it practical to compare the workmanship of various Eastern countries and also the noteworthy oriental with the best occidental objects.

The art of the armorer, essentially one of metalwork, is a field in which Eastern peoples have always excelled. In this exhibition the visitor will see not only that the armorer knew every aspect of metalwork but also that he was a consummate artist. He was familiar with every process that could be used in shaping and ornamenting iron—hammering, welding, embossing, chasing, damascening, etching, gilding with mercury amalgam, wire-drawing, and the application of niello, enamel, and gems. Most of our objects are enriched by some of these time-consuming techniques. Hence they are not ordinary military equipment, but rather parade arms, personal symbols of a soldier’s importance and nobility. Despite their warlike associations such weapons were often presented to rulers as tokens of friendship, in accordance with the oriental custom of never appearing before a sovereign or superior without gifts. The objects are exhibited in two galleries, the larger gallery being devoted to armor and weapons of practically all the principal countries of the East, the smaller gallery confined exclusively to Japan. However, because of space limitations, it is only possible to consider some of the highlights of the exhibition. Some fields, like those of Indian and Persian swords, Japanese swords and sword furniture, composite bows and archery equipment, mail and firearms are represented only by token exhibits.

The armor of Turkey, India, and Persia is represented by a few examples of exceptional quality, mainly in three cases in the center of the large gallery. Mail coats with interlinked iron plates were worn throughout the Islamic world, as well as in Russia, Poland, and Sweden. A fine fifteenth-century Turkish example of such a defense is exhibited in a separate corner case. Iron plates, chased with foliation and gilded and joined by links of mail, protected the back, sides, and abdominal region. The links on the lower part weigh less than those in the chest region, thus making the mail lighter to carry. This type of body armor combined flexibility with a maximum of protection. Our coat weighs about twenty-five pounds, about half the weight of a complete suit of contemporary European plate armor. In the East armor has never been as heavy or complete as in Europe. The hotter
climate, the generally lighter build of men and horses, and the greater value attached to mobility made lighter armor necessary even at the expense of less complete protection.

Mohammedan armor brings to mind the time of the Crusades, a remarkable period in the history of armor. The Saljuks defeated the army of the Byzantine emperor at Manzikert in 1071; in the same year they conquered Jerusalem, and with it the Holy Land. For two centuries the Christians of Europe fought the Mohammedans in seven Crusades, but, after the last Crusade, the Saljuks still held the Holy Land. While there is no complete Crusader armor extant, either European or oriental, the combined mail and plate armor illustrated here is typical of the body armor worn by ever-conservative Asiatics during the Crusades, as well as for centuries before and after this period.

It should here be recalled that mail was always the characteristic armor of the East, worn as early as Assyrian times. In the West mail was used more or less continuously from Roman times, and in the days of Richard the Lion-Hearted (late twelfth century) the vogue of mail was at its height. Thus a great deal of Near East-
LEFT: Turkish shield of watered steel, chiseled in a leaf-and-scroll pattern, damascened in gold, and set with turquoises and red stones. XVII century. Bequest of George C. Stone, 1936. RIGHT: Turkish helmet of the XV century, damascened in silver with scroll designs and Arabic inscriptions and bearing the mark of the Constantinople Armory. Its shape suggests the dome of a mosque. Large helmets such as this were worn over the turban. Anonymous Gift, 1950
ern armor of late date retains features that are survivals of armor worn by both oriental and occidental soldiers during the Crusades. At that time battles were won and lost by the cavalry, and the orientals used a much larger proportion of horse than the Europeans. As already noted, their mounts were less heavy and more rapid than those of the Christian knights; the arrows on which the Turkish tactic depended were shot from the saddle, unlike the European tactic, which confined archers to the infantry. The mounted Turks, who were renowned for their strength and skill with the composite bow, discharged a cloud of arrows when they got in range and then retired, to be followed by further waves. Their aim was ultimately to envelop the enemy, and when this tactic succeeded they closed with the short, light, razor-bladed curved scimitar which was their subsidiary weapon.

The Saljuks were succeeded by the Ottomans, and in 1453 Mohammed II, the “Conqueror” (1451-1481) captured Constantinople and made it the Ottoman capital. From this period are two Turkish helmets of splendid workmanship, richly embossed, engraved, and damascened in colors, the decoration showing inscriptions from the Koran and geometrical ornaments. Their shape suggests the dome of a mosque, and their large size indicates that they were worn over the turban. Each helmet is forged from a single piece and surmounted by a separate apical button. A number of similar casques are included in the.

Pieces of a North Indian set of armor of the xvii century. Steel cuirass with chiseled scenes, flowers, and Arabic inscriptions and an embossed face. Gift of William B. Osgood Field, 1902. Helmet with horns, symbols of defiance or victory. John Stoneacre Ellis collection, Gift of Mrs. Ellis and Augustus Van Horne Ellis, 1896

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military museums at Istanbul. Most of them bear the Constantinople Armory mark, as do the Metropolitan Museum’s Turkish helmets, which usually appears only on equipment that came into the arsenal in the church of Saint Irene at the time of Sultan Selim I, either as equipment for his own army or as booty from Egypt, Persia, and Hungary. Much of the armor in the Istanbul museums was worn in the Battle of Chaldiran (1514) between the Ottomans and the Safawis.

The influence of Persia on the armorer’s art in India was very marked, particularly during the period of the Mughal Empire (1526-1707), and many types are common to both countries. The typical Indo-Persian suit consisted of a shirt of mail over which was buckled a cuirass of four pieces—breast- and back-plates with side plates—called in Persian char-aina. Usually on each forearm was an arm guard, that on the right arm often being longer than the other, as it was not protected by the circular target or shield. The head was covered by a hemispherical helmet with nasal piece and a curtain of mail hanging from the sides and back, resembling the medieval camail. Two small sockets to hold plumes are a certain indication of Persian origin, for feather sockets in pairs are found only on Persian helmets until a very late period, when the Persian style was continued by Indo-Persian armurers. The Kurds preserved into the nineteenth century the custom, doubtless very ancient in Iran, of adding a feather to their casque plumage for every new victim of their prowess. One recalls that the familiar English expression “a feather in his cap” also means a successful undertaking.

This Persian armor shows advantageously two technical processes of which the orientals were masters, the making of watered steel (which will be considered presently) and the art of damascening. The damascened pieces, of which the Museum has an extraordinary series, show the method of enriching armor by inlay of precious metal. The surface of the steel is roughened (cross-hatched) and upon this roughened area gold or silver wire is laid down and then hammered, the roughened points of the steel being bent down in such a way that the gold is clinched strongly into position. Damascening was known in Mesopotamia from remote times, and, as employed in Christian and Byzantine art, was probably taken over by Hellenistic craftsmen from Syria. The art was practiced by oriental
craftsmen in Italy and Spain and was applied to arms and armor. Cellini in his autobiography tells of improving upon the Turkish method: "In the case of my steel articles, I cut very deeply beneath the surface; which they are not accustomed to do in Turkish work..." This means that he hollowed out more widely beneath than at the surface, in order that the inlay, of gold or other metal, might become more firmly fixed. Despite Cellini, one does occasionally find Turkish and other Eastern damascening that is executed by chiseling a track, roughening the edges, and inlaying with precious metal, as may be seen in several examples in this exhibition.

In the Orient, especially in Persia, India, and Turkey, richly jeweled arms were used for centuries. Few of them have survived, since the gems represented so great a price that when an owner died the stones were sold separately. Nevertheless jeweled court weapons are well represented in this exhibition, and they are magnificent in quality. Many of them have carved jade hilts which show the great skill of the lapidaries employed in the seventeenth century by the pretentious Mughal courts. The jewels were inlaid by cutting out a piece of the jade somewhat larger than the jewel itself and hammering fine gold into the space, the edge of the soft, ductile gold being turned over to secure the jewel. One of our hilts is of white jade with a raised vine pattern in gold and seven flowers, each made up of an emerald and six rubies. Others are of white jade with gold inlay and green jade with silver inlay, all the metalwork having been ground off smooth to give the effect of a damascened surface. One of these daggers has a jade hilt set with rubies and a pierced blade containing rolling rubies and emeralds. In one case are shown daggers with hilts of the finest workmanship, each carved in the form of an animal's head in ivory, jade, or horn and inlaid with gold and jewels. Another case is devoted to daggers with crystal hilts. Some are plain; others are inlaid with jewels or gold, either by

**ABOVE:** State scimitar of Murad V, Sultan of Turkey (1576), with Persian blade dated A. H. 1099 (1688), jade hilt, and jeweled scabbard signed: made by Mousa. Collection of Giovanni P. Morosini, presented by his daughter Giulia, 1923. **BELOW:** Persian scimitar with Koranic inscriptions. Bequest of George C. Stone, 1936

means of numerous small pegs or by tracks cut in the crystal. One crystal hilt is carved with sunken lozenges and set with rubies, emeralds, and diamonds, the gold setting forming a vine pattern. Our richest gem-encrusted weapon is the Turkish scimitar of state of Murad V, which glitters with diamonds, emeralds, and pearls. These stones were valued partly as a form of personal ornament, partly for the mystical virtues and occult powers with which they were endowed by popular belief. Hence most jeweled weapons served as amulets protecting the wearers from dangers and demons.

South Indian art is represented by several seventeenth-century fist daggers and a gauntlet sword, these from the Armory of Maharaja Sivaji, last king of Tanjore (died 1855). Serpents, dragons, and peacocks, the worship of which still prevails in India, ornament the hilts of these daggers, the workmanship of which may profitably be compared with the perforated hilts of seventeenth-century rapiers in the European sword gallery. The blades of these Indian weapons, like those of many swords of the East, are blades of European swords, which were highly prized for their toughness and flexibility.

Two cases are devoted to firearms, mainly Turkish and Indian. One notes immediately
that Eastern guns are unusual in the great length of the barrel, which is necessary to consume the large charge of weak, slow-burning powder. Their laminated steel-twist barrels were brought to a high state of perfection. It was after Napoleon's expedition to Egypt that Damascus barrels were sent to Europe and achieved so high a reputation that the method of making them was copied. In this process bars of iron and steel were placed in regular alternations and welded into one bar; then this bar, or several of them placed together, was twisted spirally and the whole welded. The patterns, like those on blades of watered steel, are intricate and often elegant. However, the twisted steel of gun barrels must not be confused with true watered steel, the pattern of which is due to crystallization.

The arts of jade-carving, jewel-setting, and damascencing, represented in sword and dagger hilts, always attract attention, but it is the watered-steel blades, showing the skill of the metalworkers of India and Persia, that are most highly prized. The early bladesmiths recognized the three principal kinds of iron, wrought iron, cast iron, and steel, but they had no scientific explanation of the nature of these materials. It was
therefore only by long experience that one could comprehend the secret of the art of blade-making. The usual designation of a blade of watered steel is “Damascus blade,” a name merely derived from a trading post of the caravans of East and West. It is well known, however, that the metal for the noted Damascenus blades of medieval times was not made at Damascus but at Kona Samundrum near Nirma in Haiderabad. The finest blades seem to have been always made in Persia, often from imported Indian steel. Of all the signatures of oriental bladesmiths the most famous is that of Asadullah of Isphahan, the bladesmith of Shah Abbas the Great (1587-1628), whose work is represented in our exhibition.

A characteristic of watered steel is the pattern on the surface brought out by etching. This pattern, as well as the qualities of strength and toughness shown in the metal, is the result of the irregular crystallization which takes place with the slow cooling of a crucible steel of high carbon content and the subsequent reheating and forging required to fashion the blade. Since the ore is converted into steel cakes of small size the blade is of necessity composed of many bars welded together in layers. The forging is done at low temperature so as not to lose the cementite (a hard, brittle carbide of iron) which crystallizes in the dots and long lines, or needles, that are the foundation of the pattern. The carbon content of the watered steel was so high that it was impossible to forge such high-carbon steel when the cementite was in needles in such big agglomerations. But because of deficient heating in the forging the metal would cool quickly; thus it was reheated and forged again and again. All these heatings and forgings resulted in the breaking up of the cementite needles and the spheroidization of the cementite. In successive forgings the metal became more ductile, until finally it was as ductile as wrought iron.

There is a tradition that in ancient times the
Indian matchlock hunting gun, about 1700. The wood stock is painted with hunting scenes in gold and colors; the gold-inlaid barrel is square with a square bore. Bequest of George C. Stone, 1936.

Indian matchlock hunting gun, about 1700. The stock is painted with animals in natural colors on a gold mat ground. The decoration of this gun required many specialized techniques. Rogers Fund, 1933.

Turkish miquelet gun, XVIII century, with a Damascus barrel. The ivory stock is inlaid with pearl and brass and mounted with engraved silver set with colored stones. Bequest of George C. Stone, 1936. RIGHT: Detail of the barrel of the Turkish gun.
blades were improved by sprinkling them while red hot with diamond and ruby dust and beating them with a mallet. The diamond would yield carbon, and the ruby aluminum; and thus the blades would acquire the properties of very good steel. It has also often been said that in the East they never use any steel for swords and knives but that which has been used for horseshoes, the hoofs of these animals having the virtue of refining iron when it is worn for a long time. Iron from old horseshoes was also widely used in Europe. This recalls to mind that the rusting piece of metal around your house is better than iron ore for manufacturing steel products. The reason is that less of the old metal is lost in processing, and the time of manufacture is shortened. The scrap contains less carbon, manganese, phosphorus, sulphur, and silicon, which must be processed out in making steel. Iron and all its alloys, once they are processed into steel, retain their qualities practically forever. Only rust and abrasion destroy them, and whatever is left is always good.

Another type of blade of watered steel appears in the kris, the most esteemed object of Malay art, and a symbol of rank and authority as well as a weapon. Its blade was developed both metallurgically and artistically. The body, which also forms the edge, was of steel, and a laminated scroll of alternately thick and thin bars of iron and meteoric iron (with nickel content) was welded upon either side of the layer of steel. A thin layer of steel was then welded on outside the "damask iron." The striated effect was the result of the opening of the loose welds in the laminated "damask iron" during the forging of the blade, which permitted steel to be driven between the laminae. The skill of the artist appeared when these layers of different metals produced various contrasts of color in the watered of the blade.

In the small gallery which is devoted to Japanese arms and armor are exhibited some of the finest pieces from the Museum's extensive collection, which dates from the fourth century A.D. to 1876, when the open wearing of swords except by military officers and court officials was forbidden by imperial decree. Primitive swords and accessories, horse-trapping ornaments, and a remarkable fourth-century helmet are shown in two wall cases. Our swords are of such quality as to denote owners of rank. The mountings are of copper and bronze, mercury-gilded, and two of the swords are bound with silver wire. The fact that these are burial finds and that they are enriched with silver and gold leads one to infer that they are older than 646, the date of the edict prohibiting the burial of treasure in a tomb for the use of the dead. Thereafter the sword was reserved as something too precious to be surrendered to the tomb. The blades of our speci-
mens are corroded, but we may assume that swords with mountings of the quality of those discussed here would naturally have blades of the best workmanship available. They were undoubtedly similar to another early blade in the Museum's collection, reground some years ago, which shows near the edge the wavy line of color (yakiba), typical of Japanese blades.

Nowhere in the world has the sword occupied so important a place as in Japan, where it became an object of veneration. The blades were forged from soft, elastic iron combined with steel, or from two or three grades of steel. The steel was produced by the cementation process. Various methods were employed for combination, one of the best being the welding together of two strips, one of iron and the other of steel. The compound strip thus formed was folded on itself, welded together, and drawn out to the original length; then it was folded and welded and drawn out as before. This process was repeated until the billet from which the blade was forged contained many thousands of alternate layers of differing metal. Extreme care was necessary to ensure each weld being perfect, as the least speck of scale or other impurity would produce a flaw or defect in the finished blade.

Japanese blades usually have curious and beautiful graining in the metal, sometimes like the grain of planed wood. These effects were produced designedly by the smith and are due to different methods of hammering and working the compound billet from which the blade was forged. The practical value of the weapon depended upon the formation of the yakiba, which appears as a band of pearly luster along the edge. The principle of using a hardened edge while the body of the blade remains relatively soft is the most characteristic feature of Japanese blades. They are essentially cutting weapons, and the smith had in view the production of a blade with a hard, keen, and durable edge, so as to get the best cutting effect while avoiding danger of breakage however hard a blow might be struck.

We have digressed from dealing with the Japanese gallery chronologically, in order to compare the various kinds of watered-steel blades of the East. Now to return to the Japanese armor. Especially important is the rare fourth-century helmet (kondu-maruhachi). It is built of an apical
disk and median and basal rings, joined by scales in groups of three, alternately of gilded and plain iron; a peak is riveted to the front of the basal ring; there are two gilded nape lames with traces of the intervening plain iron lames, and the apical disk is surmounted by a hemispherical cup which formed the base of a metal crest. This helmet shows the earliest method of decorating iron with gold. The iron was covered with a thin sheet of copper, which was given an immaculately clean surface, to which mercury was applied while it was still hot. When the surface had been thus amalgamated, the gold was laid upon it in the form of leaves. A stronger heat was then applied, the mercury was volatilized, and the gold left perfectly adherent. The helmet already shows the broad area in the front of the bowl as well as the flexible nape defense, features which have continued throughout the centuries.

This primitive Japanese helmet should be compared with a remarkable Frankish chieftain’s helmet (Spangenhelm) of the sixth century. Both are of iron covered with copper sheets and mercury-gilded. The spangenhelm is also Eastern
in construction, ornamentation, and shape. The type was brought from the borders of Persia by the Goths who were in the Black Sea area from the third century. It is significant that comparatively modern Persian helmets show the same structural features and ornamental motives.

In general, Japanese armor has been built up of scales. In the Bronze Age and early Iron Age armor was worn in which the scales were laced together at their sides, as may be seen in our case of primitive material. By this procedure they were arranged in bands or rows. And these rows were next hung one above the other by cords of doeskin, cotton, or silk. This type of armor was in common use by the eleventh century. The scales, which appear to be merely lacquer held together by silk braiding, are of the finest iron and hardened leather and are joined
Armor of an officer of a Daimyo of Sakai, Japanese, about 1550. This type of armor is known as "hiodoshi" (flame color), and it was restricted to the five great princely families. The scales, which appear to be lacquer, are actually iron and hard leather, joined by leather thongs. Rogers Fund, 1904
by stout leather thongs. The laces and toggles which supported the elements assured flexibility. It is hard to imagine the thought, skill, and time spent in making such an armor, which was highly ornamental as well as efficiently protective.

The helmet bowl is often more ancient than the other elements of a suit, since the plates had to be renewed from time to time—the silk laces rotted from wet and sun or, as contemporary writers complained, were eaten by insects.

Helmets were also often skillfully made of many lames. A helmet in the exhibition, dated 1472 and bearing the name of the renowned armorer Miochin Nobuiye, is made of fifty-seven lames, practically all of which have a tall ridge equidistant from its neighbors and graduated in height from the base to the apex. The lames are riveted together, the rivets countersunk on the outside, and they are fitted with masterful accuracy. Such armor was the best defensive costume that the adroit Japanese could devise against the use of arrow, spear, and saber. With helmets were worn grotesque masks, of which there are five principal types, varying in their degree of completeness. They are often skillfully embossed and signed by master armorer.

In Japan sword furniture by distinguished masters is as well known as famous paintings. It is highly prized and only by uncommon good fortune do fine pieces leave the East. An unusual instance of masterpieces released from Japan is the collection of the late Masauji Goda, a descendant of a line of governmental sword-art experts; this is now in the Metropolitan Museum. The few items of sword furniture included in the present exhibition were selected from the Museum's comprehensive collection. They may be studied from many points of view: the subject represented interests one person, the artist who signed it another, the quality of workmanship a third, while many are partial to certain materials and techniques. The collection is an excellent one for instruction in all these fields. All the pieces show the subtle skill of the artist in manipulating hard and soft metals.

In point of time the orientals were the first to develop metalwork, and there is good reason to believe that the smith was the earliest professional craftsman in history. India was the source of the earliest steel, and Indian steel was famous by the time of the invasion of Alexander the Great (327 B.C.). At this early period the natives of the East developed remarkable techniques and skill in welding small pieces of iron and steel that for centuries gave them superiority over European craftsmen.

The present exhibition is an extraordinary one for those who are interested in the history of the technology of ironwork, as well as the history of the techniques of ornamenting iron and steel in many parts of the world by people of widely different states of culture. It also has a special historical significance if one reflects only for a moment on the numerous struggles for supremacy between the East and the West in which arms and armor played a vital role.

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Japanese mask dated 1715, signed: Miochin Muneaki. Such grotesque masks were worn with helmets. Rogers Fund, 1913