A Viking Chieftain’s Sword

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The Viking warrior’s love for fine and beautiful weapons extends beyond recorded history into the realm of legend. The mythical smith Wayland, lord of the elves, forged the heroic swords Hrunting and Mimung, which were supposed to be of an abnormal sharpness by reason of their magical origin. And when the Vikings began their long and spectacular career of European marauding they were constantly on the lookout for weapons worthy of their prowess.

Before the Iron Age they had to content themselves with swords, cast in bronze, that were leaf-shaped and heavy-bladed. But in what is called the Celtic period of the northern Iron Age, the centuries just preceding the Christian era, they began to use swords of hammered iron of good quality. These had long narrow blades that were, unfortunately, all too pliable. They are the swords that Polybius, in a well-known passage relating to the campaign of Flaminius against the Gauls in 223 B.C., describes as buckling after a hard stroke, so that they had to be straightened out under the impatient warrior’s foot before he could deliver a second blow. More than a thousand years later the Norse sagas still tell us from time to time of blades that were bent in combat. (It has often been said that the blade of a Viking sword could be bent far enough for its tip to touch the pommel and that it would have sufficient resilience to spring back into shape. This is sheer nonsense, for a blade of such exaggerated flexibility would be of little use as a weapon. A good blade will bend so as to reduce the length in the proportion of about an inch and a half to a foot.)

There was no such thing as an efficient ferrous blade until steel, or at least steely iron, was put to use. Nor was there a definite moment in history when that took place. The early smiths knew well enough how to extract iron from ore, but uniformity of product was another matter. When they heated ore in a charcoal fire for a few hours it became more or less completely reduced and they could forge it at red heat into a bar of iron. But sometimes the iron was soft and malleable while at other times it was hard and steely. Even steel itself must frequently have been one of the products whenever the reduced iron was exposed for a considerable time to the carbonizing action of the charcoal. Thus steel was much more prevalent in early times than is generally believed, but it was made by natural rather than scientific means. Not knowing the chemical factors that accounted for the variation, the smith could try to observe and repeat whatever conditions seemed to be present when he managed to turn out a superior blade. Perhaps it was because of this that he began to be considered as much a magician as an artisan.

Iron and steel held much of their mystery, after all, until the eighteenth century; it was not until modern chemistry was applied to them that the magic disappeared. When we recall that even after hundreds of years’ background Cellini had anxious moments about his success in casting the bronze Perseus, we cannot wonder that in earlier times each blade that was made was a challenge to the smith. Not until all the preliminary processes came under the experimental method of science did iron and steel cease to be a luxury and their manufacture move from the province of art to that of technology. Nor should

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Detail of carved doorpost from Hyllested Church in Norway, illustrating the legend of Sigurd. Here Regin forges Sigurd's sword; Sigurd proves his sword; Sigurd slays Fafnir. Historical Museum, Oslo

ON THE COVER: The Viking sword described within. Shield boss (Umbo), Merovingian, VI Century. Gift of J. Pierpont Morgan, 1917. Knight's sword, French, XV Century. From the collection of Giovanni P. Morosini; presented by his daughter Giulia, 1932
we forget that the actual materials for the history of metalworking are to be found in the museums of art and archaeology. What we can do now the schools of chemistry and engineering can tell us; what our ancestors did in metallurgy can best be learned by the study of museum collections.

We have already noted that the early northern sword was unreliable. The Roman legionaries, on the other hand, had used iron swords with straight, short, double-edged blades that were thick enough not to bend. The manufacture of such blades became an established industry in the partly Romanized districts of the lower and middle Rhine valley, whence came the famous Nydam (Schleswig) swords of the fourth century, one of the earliest sword finds of the barbarian migrations. Along the extensive frontiers of the Roman Empire there was, of course, daily intercourse, warlike or peaceful, between Romans, Romanized barbarians, and more or less barbarous tribes. Though the Romans never conquered Denmark they undoubtedly had some contact with the Danes. We have found, for example, iron swords from Nydam and Vimose on the tangs of which the Danes had stamped in raised Roman letters such Scandinavian names as RICVS, RICIM, COCILVS, and TAVIT. The Nydam type of sword was widely used by the Viking marauders for several centuries beginning about 300 A.D., and was probably the real original of the heroic brands celebrated in Beowulf and other northern epics.

The Nydam swords were a radical improvement over anything the Vikings had previously used. They were of the type now called, for reasons we shall see, pattern welded, and were tougher and more resilient than the early soft iron blades. Albert France-Lanord, of the Musée Historique Lorrain in Nancy, whom I had the pleasure of visiting in 1951, has made a careful study of Frankish and Viking pattern welded swords. After examining many blades he found that the smiths who made them, by piling together strips of iron and carburized iron, folding them in various ways, welding them, and then drawing them out under the hammer, had produced patterns of various kinds. (The same gen-

Detail from English xiv Century illuminated manuscript  Courtesy of the British Museum
eral effect can be seen in the variegated color patterns of glass paperweights.) Sometimes the cutting edges, very slightly carburized, are lap-welded to the central portion. Or the core of the blade may be a piece of steely iron a little longer and wider than the surface pieces, the projecting parts of the steely iron thus forming the point and edges of the blade. The actual metal from which the blades were made was no better than what went into the first overpliable wrought-iron swords, but the method of working it gave superior results. The makers of the pattern welded blades began with small pieces of iron which they welded together to get bars of the required size. This repeated welding crossed and interwove the fibers in all directions, thus increasing the tenacity of the final product. The varying hardesses of the initial small pieces gave to the composite piece greater elasticity than the old wrought-iron blades had possessed. And from an ornamental viewpoint the contrast of the welded metals resulted in a pattern which showed prominently when the metal was corroded with acid, as the iron was eaten more readily than the steel.

During the ninth, tenth and eleventh centuries, in the last and fiercest wave of their depredations, the Northmen infested the coasts of France and sailed up the rivers, burning and ravaging as far as Rouen and Orléans. In 845 they sacked Saint-Denis and were paid seven thousand pounds of silver to depart from the country, swearing by their gods and their arms never to return to the possessions of Charles the Bald except as his auxiliaries. The next year they came back to demand further ransom. Even the convents of Saint Martin of Tours and Saint-Germain-des-Prés were sacked. Castles and walled towns were built as protection against Viking raids, and mailed horsemen, armed with sword and lance, became available as a mobile and formidable fighting force. Both castles and mounted soldiers fitted in admirably with the growing feudalism, which, though not altogether military in its origin, was rendered indispensable by military necessities. Thus the Vikings in their piratical days contributed greatly, as enemies, to the elevation of that feudal aristocracy of which, in their Franco-Norman stage, they were perhaps the noblest characters. When William
the Conqueror came to the English throne in 1066 their invasions ceased, but in the meantime they had passed on to their victims great physical vigor and a high sense of honor. When their concept of the heroic acquired a Christian morality, it led to the beginning of chivalry and served as a cornerstone of European culture.

The graves of the Teutonic conquerors of Europe from the period of the dismemberment of the Roman Empire to the triumphs of the Normans in the eleventh century have yielded rare and valuable objects of war equipment. In the time of paganism a Viking chieftain was buried with everything he might need to get to Valhalla. The most important item, naturally, was his sword—which was often bent before it was buried, to prevent its being reused in the mortal world. In localities that were early Christianized Norse swords are generally dredged from the beds of rivers, the sea rovers' highways.

The Museum acquired in 1955 a Viking chieftain's sword that is a fine example of metalwork both decorative and functional. It is reported to have been excavated from the canal at Orléans, France, but the date of the find is not known. Various things besides the place it was found, however, lead us to believe that it could have been used by one of the chieftains of the time when Rollo (about 860 to about 930 A.D.), the renowned Viking leader, was first Duke of Normandy. It closely resembles, for instance, the swords shown in the eleventh-century Bayeux Tapestry, the undoubted prototypes of the medieval knightly sword. The Bayeux swords, like ours, are of Viking type: straight, broad-bladed, double-edged, with a shallow fuller running most of the length of the blade.

The construction of the blade of our sword is useful in dating it, but is of even greater interest as an example of metalworking. It illustrates a technical process involving the welding of ferrous metals of different quality that show on the surface of the end product the variegated patterns formed by their fibrous structure. This type of metal is called by various names—"damascene steel," "Damascus steel," "watered steel," or
“pattern welded” iron. The terms have been so loosely used that it seems well to define them at the outset. All the more so because, in due course, we will speak of its hilt as “damascened” with silver.

Our sword blade is made of welded iron showing a pattern on both faces. About ten years ago Herbert Maryon referred to this sort of structure as pattern welded, which identifies clearly the type of work involved. The pattern welded blade was used in Europe from early Christian times to the eleventh century. It was widely used in the East as well—until modern times, indeed, as a good many Oriental blades in our collections show. The same process was used, eventually, for gun barrels which, developed originally in the Orient, were manufactured to perfection in France, England, and Germany during the nineteenth century. The swords and firearms brought back to Europe after Napoleon’s Egyptian expedition met with such admiration that Westerners attempted to reproduce this modern “Damascus steel.” In 1804 Nicolas Bernard, a gunsmith of Versailles whose work is represented in the Museum, obtained the first practical results in making “Damascus barrels,” of which many varieties were ultimately developed. In principle, bars of iron and steel placed in regular alternations are welded into one; then this bar (or two or three such bars placed together) is twisted spirally and the whole welded. When a gun barrel made of such a bar is polished, intricate and often elegant patterns become apparent.

Pattern welding, however, must be clearly distinguished from an entirely different technique which produces still another thing frequently known as a “Damascus blade.” This second technique produces a pattern distinctively different from that shown in the blade of our Viking...
Detail of Persian watered steel blade signed by Asadullah  
Bequest of George C. Stone, 1936

The blade is well preserved and was apparently never bent. The broad shallow median groove runs from the guard to about five and a half inches from the point. Apparently the blade was made of thin strips of iron wound transversely around an iron core and then welded, since the pattern runs out to the edges; the bar was forged to the required shape and the central area was ground away to reduce the weight and lend resilience. The tang may be in one piece with the core of the blade, but of this we cannot be sure because the guard conceals the normal junction area.

The art of inlaying one contrasting metal on
another has long been referred to as “damascening,” and the traditional term describes accurately one of the techniques used to decorate the hilt of our Viking sword. It is iron, completely covered with copper wire hammered into grooves which are clearly visible under a microscope. In alternate rectangular areas are silver strips, each formed of two flattened wires, and niello, an amalgam of silver, copper, lead, and sulphur which, like enamel, is applied in paste form and then fused to the metal beneath it. Nearly all the silver and much of the niello are still present. The techniques used are much the same as those employed in the Museum’s rich series of Merovingian buckles. (The belt buckle, like the sword, was an indispensable part of the warrior’s equipment, and was the object of special care on the part of goldsmiths who ornamented many buckles with rich and intricate motifs in niello and silver. For the churchman the belt was the liturgical emblem of moral purity; for the soldier it was the symbol of courage—it bound him to the sword which represented the warrior virtues.)

The pommel is composed of an upper and a lower bar, the former trilobed, the latter elliptical in horizontal section. The tang passes through the lower bar and its terminal is riveted. Two rivets pass through the under side of the lower bar to secure it to the upper. (The pommels of Merovingian swords in our collection are similar in construction.) On the pommel are three groups of twisted silver wire, one encircling horizontally and dividing the upper from the lower bar, the other two disposed diagonally over the

**LEFT:** Hilt of our Viking sword. **RIGHT:** Hilt of Carolingian sword. The pommel is damascened and the blade pattern welded. Gift of George D. Pratt, 1928.
Details of variegated welded pattern on blades from Sumatra, the Caucasus, Java, and Malaya

Bequest of George C. Stone, 1936
top of the pommel. Each group consists of three strands of wire, the outer two twisted to the right, the center one twisted to the left. This braided wire inlay suggests an earlier custom of binding a relic or charm to a flat oval pommel to counteract misfortune or strengthen the arm of the warrior.

Whether the Vikings actually made any of their pattern welded swords is a matter of conflicting opinion. It seems unlikely, however, that they would have depended entirely upon foreign manufacture, for a country that could produce good swords was in their day far more powerful than a country that could not. With all the bog iron available, with their worship of the smith, with their need for the best weapons, and with the great technical knowledge they displayed in shipbuilding and seamanship, surely the Norsemen could ultimately have made their own swords. Swords of the latest pagan period have been found in Denmark which have runic inscriptions formed by letters of iron let into the iron blades. There is no reason to suppose that ingenious swordsmiths, anxious to improve the quality of their blades, could not have experimented with every kind of ore and every heating and cooling method, and so have discovered or rediscovered for themselves the most practical as well as the most aesthetic principles for welding and forging iron and steel. It is not generally known how many different peoples have actually used pattern welding. The Museum's extraordinary collection of pattern welded blades from many widely separated areas—India, Japan, China, Tibet, the Caucasus, the Philippines, the Malay Peninsula—is a strong argument for independent invention of the technique.

To those of us who are interested both in the life that was lived in ancient times and in the various survivals of its forms and customs, our Viking sword is an object of considerable value. When we study it artistically and technically we see that it is a masterpiece of early technology and early art combined.

*Belt buckle, Frankish, VII Century. Interlaced design in silver niello*

Gift of J. Pierpont Morgan, 1917