

## CHAPTER VI.

PROGRESS IN CULTURE AND CIVILISATION DURING THE  
BRONZE AGE.

THE discovery of bronze, and its introduction into the simple arts and industries of the Stone Age people of Europe, may be said to have speedily revolutionised their whole system of social economy. Not only had all the primitive implements and weapons to be remodelled, in accordance with the principles of a metallic *régime*, but new industries and higher artistic aspirations were engendered which, by degrees, greatly modified the commercial and social aspects of life.

That this metallic innovation first found its way into Britain by means of cutting implements of bronze imported from abroad there can be little doubt, as the oldest metallic objects known—the small hand-daggers generally found in graves—were made of the best quality of bronze. Now, since a knowledge of this compound implies a previous acquaintance with its component elements, copper and tin, it follows that the progress in metallurgy had reached the stage of selecting the best combination of these metals for the manufacture of cut-

ting tools, at the same time as, if not indeed before, the simple metals were known to the inhabitants of the British Isles. That this skill in the working of metals had not been acquired by the ancient nations on the shores of the Mediterranean without a long experience of the uncombined use and qualities of copper and tin, and of the various methods of hardening the former, was demonstrated by Dr Gladstone, F.R.S., at the meeting of the British Association held at Liverpool in 1896. In a paper on "The Transition from pure Copper to Bronze made with Tin" he writes as follows: "The use of copper in Egypt can be traced from the fourth dynasty, when King Seneferu captured the copper and turquoise mines of the Sinaitic peninsula. Tools made of this metal have been found not only in Egypt, belonging to the fourth, sixth, and twelfth dynasties, but also in Assyria, at Lachish in Palestine, Hissarlik in Asia Minor, and Naqada. Attempts were made to render this copper harder and stronger, and that in three ways. First, the admixture of a large quantity of suboxide of copper, or of its formation in the process of smelting, as seen in adzes from Egypt and Palestine, and perhaps Naqada. Second, the presence of a little arsenic or antimony, as shown in many tools from Kahun dating from the twelfth dynasty, and from the Sinaitic mines, as shown in a communication to the French Academy by Berthelot a few weeks since. Third, the admixture of a little tin, as at Kahun, the Sinaitic mines, and Cyprus, perhaps not exceeding 1 per cent. When, however, the superiority of tin, as the hardening material, came to be acknowledged, it was added in larger quantities, and formed the alloy known as bronze. Such proportions as 4 and 6 per cent occur in early specimens, as at Hissarlik; but subsequently about 10 per cent was usually employed. Tools of this composition are found not only in Egypt during

the eighteenth dynasty, but in most countries, and for an immense variety of purposes.”<sup>1</sup>

The existence of a real Copper Age in Egypt, Cyprus, and other countries bordering on the Levant, as thus indicated by Dr Gladstone's researches, naturally prompts us to inquire if there had been a corresponding period in Europe when copper implements and tools had been in use before the invention of bronze. The late Von Pulszky, Drs Much and Gross, and, more recently, Professors Hampel and Montelius, have advocated the affirmative side of this problem, chiefly on the grounds that in Hungary, and on the sites of a few lake-dwellings, a large number of copper relics have been found; and, moreover, that in many countries the lowest type of metallic celt was made of copper in imitation of the stone celts previously in use. But none of these arguments are, in my opinion, applicable to Britain, as the simplest form of the bronze celt is precisely similar to the earliest copper celts. That copper was known in Europe prior to the knowledge of the art of converting it into bronze is likely enough; but as the pure metal was inferior to flint for cutting purposes, it produced no perceptible change on the social industries of the period. It was the art of hardening copper which first stirred up the slow channels of industrial progress in the ancient world and raised mankind to a higher mechanical platform. The finding of so many of these primitive copper celts throughout Europe is, no doubt, suggestive of a Copper period; but at the same time it must not be forgotten that flat axes of the best quality of bronze have also been found in circumstances which render it probable that they are as old as the former. Dr Montelius, one of the most recent advocates of this theory, figures in his *brochure*, 'Findet man in Schweden Ueberreste von einem

<sup>1</sup> Brit. Association Report, 1896, p. 930.

Kupperalter,' two metal celts, found together in a cultivated field at Pile, in Sweden, which could be used as an argument to prove that bronze was known and utilised in Sweden before copper. One of the celts is a large well-shaped implement, over 8 inches in length, with perpendicular borders and raised edges, and ornamented with a series of curved lines running across its surface. The other is smaller (6 inches in length) and has no raised border, nor indeed any specific character which in appearance would differentiate it from the most primitive type known. But the former is described as being made of copper, and the latter of bronze. The use of pure copper in the manufacture of some of the axes, even supposing that it had been so utilised before the introduction of bronze, could have lasted only a very short time in Western Europe—so short, indeed, that during its prevalence not a single progressive change or improvement is to be noted in respect of any specimen that can be shown to be older than the Bronze Age. No advocate of the Copper-Age theory holds that all the objects made of copper found in Hungary are actually earlier than the Bronze Age—many of them being similar in style and pattern to objects regarded as characteristic of that period. The existence of these Hungarian copper implements, like the ornamented copper celt from Pile, must, therefore, be explained on other grounds than the chronological priority of the discovery of copper over bronze.

As soon as the metallurgic art had taken root among the prehistoric people of Scotland, they began to manufacture their cutting implements and weapons of bronze, modelling them, in the first instance, after the analogous objects of the Stone Age, or the imported metal specimens which already had passed through the stage of imitation in some outside area. I have elsewhere<sup>1</sup> shown that a similar derivative

<sup>1</sup> Prehistoric Problems, p. 330.

connection can be traced between not only the flat axe, whether of bronze or copper, and the stone celt, but also between the knives, saws, sickles, daggers, &c., of the two culture periods. By-and-by, however, all these objects underwent progressive modifications, probably in proportion as their makers had gained greater knowledge and experience in the art of working the metal. But as no remains of any kind of buildings, excepting sepulchres, have as yet been discovered on the Scottish area which can with certainty be assigned to either the Stone or Bronze Age, we are deprived of the best source of evidence regarding the evolutionary phases through which these objects passed in their transitions from stone into metal. The relics at our disposal have been for the most part discovered accidentally, either as concealed hoards or as stray objects in the soil. Such hoards have been found in various circumstances, as, for example, by peat-cutters, and by workmen engaged in digging drains, foundations of houses, gravel-pits, &c. The dredging for marl in lake-beds — an occupation which was very common at the beginning of this century — has brought to light some valuable antiquities. The plough has played no mean part in such discoveries; nor must we neglect to mention the services of the poacher, the mole, the rabbit, and other burrowing animals. Occasionally evidence of chronological sequence is to be derived from the contemporaneity of articles thus associated. Evolutionary changes, indicating progressive improvements in the various parts of a composite object, are sometimes of much value in this respect, as, for example, the development of the different parts of a fibula. Now it can be clearly demonstrated that the original safety-pin occupies an intermediate stage between the primitive straight pin and the highly ornamental brooches of later times, such as were in use among the Celts, Saxons, and

Scandinavians. The connection between such derivative objects is often obscure until all the intermediary links of a series are exhibited side by side. No better illustration of this can be given than Dr Hans Hildebrand's description of

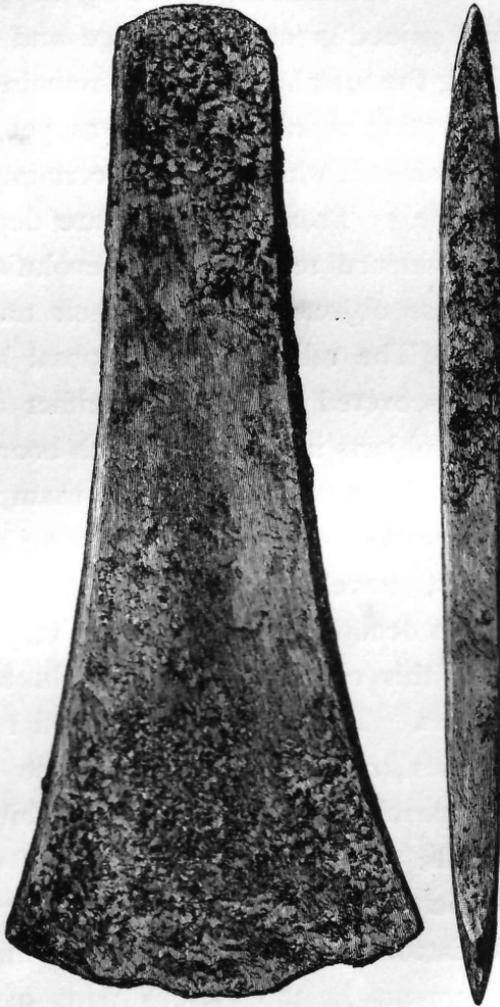


Fig. 82.—One of five bronze axes found at the "Maidens," Ayrshire (†).

the successive transformations which connect the Roman fibula with the boar's-head brooch of Scandinavia, so characteristic of Viking burials and hoards in this country.<sup>1</sup>

<sup>1</sup> See *Scandinavian Arts*, pp. 22-30.

I. *Axes, Chisels, &c.*

The division of axes into flat, flanged, winged, and socketed, not only sufficiently defines these implements, so far as any classification is necessary, but also describes the chronological order of their development. The flat celt (figs. 82 and 83) was the first to spread over Europe, and it is the form most com-

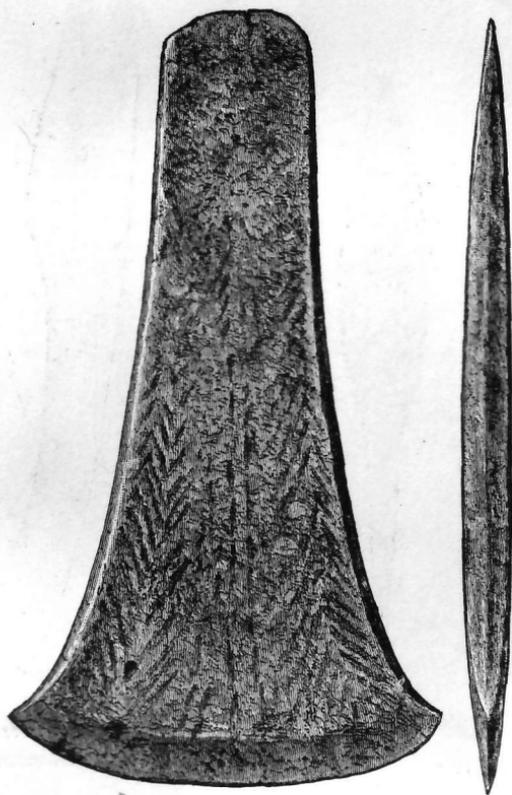


Fig. 83.—Bronze celt found on Bog Farm, near Kilwinning ( $\frac{1}{2}$ ).

monly met with in the British Isles. In the course of time, probably owing to improvements in the manner of hafting, the first alteration was made by raising a flange on each side; then these flanges became larger and curved inwards (fig. 84) until the two nearly met, thus forming two imperfect sockets, one on each side. Coincident with these

changes a stop-ridge appears between the flanges, and a loop on one of the edges of the axe to fasten the handle more securely (fig. 85). Finally, we have the single socket, which is the culmination of previous adaptations, all of which now disappear or become merged into this more perfect mode of fastening the handle. Nothing remains to show these evolutionary stages except the direction of the socket and the

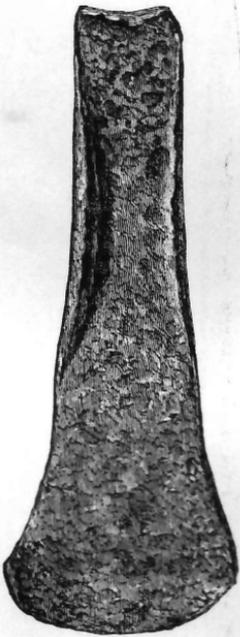


Fig. 84.—Bronze *winged celt* found near Largs ( $\frac{1}{2}$ ).



Fig. 85.—Bronze *palstave* found on the farm of West Glenbuck, Ayrshire ( $\frac{1}{2}$ ).

side loop (fig. 86). It is only in the Iron Age that we meet with the transverse socket, and even then the change seems to have been effected very gradually, as both in Hallstatt and La Tène the prevailing type of axe retained the vertical socket.

As to the methods of hafting these various forms of the implement, it may be observed that the first three types were inserted into slits in the wooden handle, and hence, when in

use, the wood was apt to split; whereas the fourth had, instead, the handle inserted into the socket in one solid piece.

The flat axes vary greatly in size, from a few inches up to  $13\frac{5}{8}$  inches in length, this latter being the largest known in Scotland. They were cast in open stone moulds, several



Fig. 86.—Socketed bronze axe-head found on the farm of Knock and Maize, Leswalt, Wigtonshire ( $\frac{1}{2}$ ).

specimens of which may be seen in the National Museum. The socketed axes are generally shorter than the intermediate flanged types, but they vary considerably both in size and in the shape of the blade. The bronze celt represented in fig. 87, and included in the collection of antiquities presented by

Sir Herbert Maxwell to the National Museum, is referred to by Sir Herbert as "a very delicate little article, and, so far as I have seen, there is none similar to it in any collection in Great Britain or on the Continent. Mr Evans assigns it to



Fig. 87.—*Miniature ornament in the form of an axe-head found on the farm of Stelloch, Glasserton, Wigtownshire (†).*

a late period of bronze manufacture, but it is difficult to say whether it has been intended for an ornament or for use as a small glyptic tool or chisel."<sup>1</sup>

Chisels and gouges are generally socketed or tanged, and differ from the axes only in being elongated and more slender. The simplest form is a bar of metal sharpened at one end and blunt at the other so as to receive the blows of a hammer. When tanged there is usually a projecting rim or bar of the

metal about its middle so as to act as a stop-ridge for the wooden handle.

So far as I know, no bronze hammer has yet been discovered on Scottish soil; but a few specimens of this most essential tool have been recorded from England and Ireland, all of which have a socket for the handle at one end. A few of these are figured by Sir John Evans.<sup>2</sup> On the site of the lake-dwelling of Wollishofen, near Zürich, six hammers of this same type were among the remains dredged up, two of which, along with a bronze anvil from the same place, are

<sup>1</sup> Proc. Soc. A. Scot., vol. xxiii. p. 221.

<sup>2</sup> Bronze Implements, &c., p. 178.

figured by me.<sup>1</sup> It is remarkable that the principle of hafting the stone hammers and axes by a transverse perforation for the insertion of the wood—if these implements are really to be regarded as products of the Stone Age—should have been so thoroughly discontinued during the Bronze Age, while in the Iron Age, especially within the British Isles, even at a comparatively early period, the perpendicular socket was almost entirely superseded.

## 2. *Knives, Saws, Sickles, and Razors.*

One of the most noteworthy facts in connection with the Bronze Age in Scotland is that neither knives, in the proper sense of the word, nor saws of bronze have as yet been discovered among its remains. The small hand-dagger with riveted handle, found occasionally in graves, may have served the purposes of a knife. The objects described by Sir John Evans as a knife is a dagger-like blade with a socket for the insertion of a handle; but specimens of these implements are rare in Scotland (fig. 100). In England they are more frequently met with; and in Ireland they are fairly abundant, not less than thirty-three having been recorded in Sir W. Wilde's catalogue. One of the Scottish specimens found at Kilgraston, Perthshire, is engraved by Sir John Evans,<sup>2</sup> and another by Sir D. Wilson.<sup>3</sup> Fragmentary specimens have been found at Clova and a few other localities.<sup>4</sup>

A flat bronze blade with a perforated tang, found in the lands of West Cairns, is figured and described by Mr M'Call in his 'History and Antiquities of the Parish of Mid-Calder.'

<sup>1</sup> Lake-Dwellings of Europe, fig. 4, Nos. 8, 18, and 21.

<sup>2</sup> Bronze Implements, &c., fig. 243.

<sup>3</sup> Prehistoric Annals, vol. i. p. 390.

<sup>4</sup> Proc. Soc. A. Scot., vol. xxvii. p. 12; vol. xxviii. p. 239.