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IN
PREHISTORIC TIMES

BY THE SAME AUTHORS

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FIG. 1.—Magdalenian Painting.

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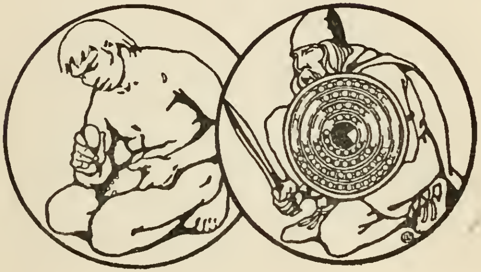

WRITTEN & ILLUSTRATED BY
MARJORIE & C. H. B. QUENNELL
Authors of "Everyday Things in England"

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brother scientists who condemned this idea, pointing out that life must start at some definite point, and spread from this centre to other parts of the world. For the ordinary man, it seems sufficient to suppose that if you find the same kind of fossil in the limestones of America and England, and find the limestone itself in the same relative position to the other strata, then if the two are not twin brothers they must be most nearly related. The modern scientist can find out by observation how long the delta of a river, or any other form of sediment, takes to accumulate. In this way they form a scale by which they can also estimate the age of the older deposits.

To revert then to our strata : The Chart (p. xi) shows the Geological Periods and the stratified rocks. These latter are shown in the order in which they were deposited, starting from the bottom upwards. To illustrate this more fully, we give a section across Wales and England (Fig. 3).

FIG. 3.—Section across Wales and England.

We have Snowdon in the west at A. Its base at 1 is built on Pre-Cambrian, Cambrian, and Ordovician rocks, and there is an outcrop of these more to the east. Eruptive rocks appear at 3, and the Silurian at 4. The Devonian at 5, and at 6 the Gneiss at Malvern. All this west part of England has been disturbed, and the many skins or strata of the earth distorted by enormous physical disturbances. At B are the Malverns, and here there is a fault or break in the stratum, but as we go east the geological conditions become easier to understand ; 8 and 9 are Red Marl or Triassic ; 10 the Lias. At C we have the Cotswold Hills composed of the Oolites, 11 ; the Lias and Oolites are Jurassic. This is overlaid by the Greensand at 12, and the Chalk of the Chiltern Hills at 13; these are Cretaceous. Then we have the Eocene beds at 14.

We shall not be very concerned with the primary rocks in our study of prehistoric life, but shall soon come across references to those of the Mesozoic, or Secondary Period.

Here we find the Cretaceous, or chalk beds, and it was in these that primitive man in Britain dug for the flints he needed to make his implements.

Perhaps the next of our difficulties will be the constant reference which is made by the archæologists to the Ice Ages, and times when the climate of England was much colder than it is now ; when we had glaciers here, and the North Sea was a solid mass of ice uniting Scandinavia with East Anglia. There are many theories as to how this came about.

We all know that the earth revolves round the sun on a path which is called its orbit. It completes the circle in a year, and turns on its own axis in so doing once a day,

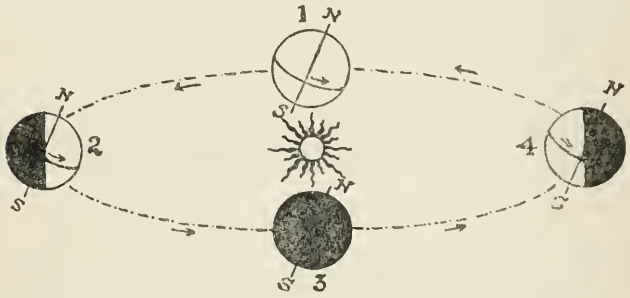

Fig. 4.—Causes of the Ice Ages.

or 365 times in the year. As the earth turns round on its axis, the part which is toward the sun enjoys daylight, and in the part which is away, the people sleep because it is the night.

It is quite a good plan to make a rough working model of all this on the dining-room table, as Fig. 4, and if the family possesses a globe it will help. If not, let an orange take the place of the earth, and drive a knitting-needle through it for the axis. You can eat the Earth afterwards. A candle in the middle of the table can be the sun. If the table is circular, the edge can be the earth's orbit ; if not we can draw one in chalk. If on this path, the knitting-needle is placed in a vertical position, so that the equator of the orange, or earth, is level with the candle,

or sun, then it can be seen that the equator will derive more light from the candle than the top and bottom where the knitting-needle comes through. So we discover in the case of the earth, that the equator is hotter than the polar caps, because it gets more sunshine. If we move the orange round the orbit, turning it as we go, but keeping the knitting-needle upright, we arrive at day and night, heat and cold, but not summer and winter, or why, when we have summer, Australia has winter; but let the knitting-needle lean over, and we have an entirely different state of affairs. This is what has happened, and to-day the angle of inclination of the equator to the orbit of the earth is 23° 27′. Our diagram (Fig. 4) shows how this affects the seasons.

The Vernal Equinox of 21st March is shown at position 1, when day and night are equal. At the Summer Solstice on 21st June, position 2, all the North Hemisphere will be turned towards the sun, and we get the longest days. At the Autumnal Equinox, 23rd September, position 3, day and night are again equal. The Winter Solstice, position 4, comes on 21st December with the shortest day, and the Northern Hemisphere leans away from the sun and warmth.

The scientists tell us that this inclination of the equator to the earth's orbit, through long ages, varies from 22° 6′ to 24° 50′. The former would give us less difference between winter and summer than we have now, the latter would increase the difference. The shape of the earth's orbit changes, and sometimes is roughly elliptical, with the sun much nearer to one end than the other. This would mean short summers and long cold winters.

There is what is called the Precession of the Equinoxes; the earth wobbles as it spins, and this further affects the inclination of the axis. The Gulf Stream gives us now a better climate than our latitude entitles us to. When we bear in mind that the scientists tell us that a very small fall in the temperature would bring back the snow and ice, then it is easy to see how a combination of the conditions we have mentioned may have caused the Ice Ages.

There is no need for alarm, and we need not rush off to buy skates in preparation for the next Ice Age. Thousands of years pass as the earth slowly wobbles on

its journey. If we refer to the Chart, we shall see how all through Pliocene times weather conditions became colder, and culminated in the first Ice Age—then came a more genial time which the scientists call the First Interglacial Period, because they have arrived at the conclusion that there were four glacial periods, with three interglacial periods in between, and a post-glacial one after the fourth glacial period. We may be living in an interglacial period now.

The next of our difficulties may be the constant reference which the archæologist makes to the action of Glaciers ; to large surfaces of land being denuded and deposited elsewhere, and to a period which is referred to as that of the River Drift. We will start with the Glaciers.

A glacier is a very slowly moving river of ice. Gathering its forces from the snowfields on the summits of the mountains, it moves by gravity down the valleys, and collects tributaries as it goes along. In doing this the snow solidifies into ice, and it is quite easy to see that a tremendous pressure must be exercised on the sides of the valleys. If we go into a mountainous region, which during the Ice Age had glaciers, we shall find plenty of evidence of their existence. The sides of the valleys have been worn smooth by the slowly moving mass of ice grinding into the rocks (*roches moutonnées*), there will also be piles of splintered rocks which are called moraines. The intense cold causes the rocks above the valley to crack and splinter, and fragments fall, and are left as embankments at the sides, or rolling on to the ice are carried along. These are called lateral moraines (1, Fig. 5). Where two glaciers join, these meet, and flowing down the middle of the lower glaciers are called medial moraines (2, Fig. 5). In this way glaciers transport materials for long distances. The débris of the lateral moraines falls into crevasses, or cracks in the ice, and appears lower down in the terminal moraines.

The glacier moving downhill, comes to a place where the temperature is warmer, and the ice melts. Here we find what is called a terminal moraine or moraine girdle (3, Fig. 5). These are generally fan-shaped, and represent the heap of broken rock and stone, which has been pushed forward under the nose of the glacier, and gathered up by

FIG. 5.—Glaciers and Moraines.

it in its progress from the bed and sides of the valleys. The existence of old moraine girdles, which have become covered with soil and trees, and now look like hills, is a proof of ice conditions in former times. There are girdle moraines as far west as Lyons in France, which prove that the Swiss glaciers were once of enormous length. High up on the sides of valleys, the *roches moutonnées* show that the glaciers were once very much deeper. All those facts help the scientists in their conclusions as to the duration of the Ice Ages, and the temperature general then.

Behind a moraine girdle, in the bed of the old glacier, we find a sort of enormous basin, filled with hummocks of boulder clay, called drumlins, at 4. To make this apparent the ice of the glacier has been broken away at 5. This clay is the mud which was brought down by the glacier, and was formed by the churning action of its underside on the rocks over which it passed.

Below the moraine girdle, we find what the Germans call Schotter fields. It is here, where the ice melts, that the river comes into being, carrying away the smaller pieces of rock, depositing them first in the shotter, then breaking and rolling the pieces until lower down we find them in the gravel formations of the river terraces. Our readers, perhaps, will know a river whose banks descend in terraced steps ; it is a very usual formation. This connection between the glaciers, their girdle moraines, and river terraces is very important, because by their aid great men, like Professors Geikie and Penck, have worked out the theory of the Glacial Periods.

Professor Penck studied the river Steyr in Upper Austria, and found that each of its terraces connected up with the girdle moraine of an ancient glacier, and from this the following theory of the formation of terraces themselves has been evolved. Diagram Fig. 6 has been prepared to illustrate this.

We must bear in mind that before what we now call glacial times there had been other cold periods, and earlier river systems. Some great climatic changes must have been responsible for the extinction of great reptiles like the Dinosaurs, who, being large bodied and small brained, could not adapt themselves to change. The Ice Ages

played their part in man's development; he learned to suit himself to new conditions and surroundings.

Bed A in diagram Fig. 6 would be pre-glacial. In the First Glacial Period, at the end of Pliocene times, the volume of water in the rivers would not have been large, because so much was locked up in the ice of the glaciers.

Then came the warmer weather of the First Interglacial Period, when vast quantities of water were melted out of the glaciers, and hurrying down the old river bed, or forming another, cut a new channel to B. As the water lost its power to cut channels it began to build up the bed of gravel at C.

Then the Second Glacial Period came on, and the river again shrank in size. At the Second Interglacial Period the bed was cut down to D, and the bed of gravel at E built up gradually afterwards. The channel was cut down to F in Third Interglacial times, and bed G formed, and the final channel H cut in the warmer times after the Fourth Glacial Period, which we call post-glacial. An ingenious method has been applied to form an estimate of the time which has elapsed since the last Ice Age. As the glaciers retreated, during each summer mud was melted out of them and deposited in the form of clay; a band each year. In Sweden this is called banded clay, and in that country Baron de Geer has counted all the bands, and so formed an estimate of time.

To revert to the theory of how the terraces 1, 2, and 3 were formed, we have shown the gravels of which they are composed by a dotted surface, and it will be seen that they are in reality the edges of old river-beds, which have been left behind as the water cut its way down. Our readers may think this sounds very ingenious, but demand some other proof, that all the terraces were not formed in one interglacial period.

This is supplied by the flint implements of varying design, and the fossil remains of animals of widely different periods, which have been found in the gravel formations of river terraces in many parts of the world. This is the period of the River Drift.

Our drawing (Fig. 6) can be taken as showing the terraces of the Somme at S. Acheul. The Somme is celebrated, because here it was, at Abbeville, that M. Boucher

de Perthes discovered large quantites of flint implements in the gravel deposits, in the middle of the nineteenth century. As early as the end of the seventeenth century, a fine pear-shaped flint implement, which is now in the British Museum, had been found near Gray's Inn Lane, London. Mr. John Frere discovered others at Hoxne, Suffolk, in 1797, and realized that those tools belonged "to a very remote period indeed, and to a people who had not the use of metals."

So that just as the fossils led the geologists to the theory of the stratification of the rocks and enabled the various layers to be dated, the flint implements and fossil remains of animals in the terraces suggested the idea that these had been formed at different times. The additional fact that the terraces of the Somme, Thames, and the Wey at Farnham, are much alike in general formation, and that in them are found flint implements which are of the same pattern, suggests that people of the same state of civilization once lived on their banks.

It will perhaps be as well for us now to run through the implements found in the terraces of the Somme, because it will familiarize our readers with the recognized French names for the various divisions of the Old Stone Age. We have no corresponding English names, so the French ones have been very generally adopted.

No implements have been found in the upper plateau No. 4, which leads us to suppose that man did not live on the banks of the Somme before the First Glacial Period. In the next terrace downwards, No. 3, Strepyan implements are found. We shall explain what these are later; meanwhile, how did they get there? We have imagined a mighty river rushing down in flood at the beginning of the First Interglacial period, when the tremendous glaciers began to shrink and melt away, and this would be quite a different matter to the wastage only, which went on during glacial times. This flood of water is not an exaggeration. Remember that we are writing about periods which extended over, not hundreds, but thousands of years; as well that we are living in an interglacial period now. In September 1920 a warm spell of a few days, accompanied by rain after a rather cold summer, caused a serious situation at Chamonix in Switzerland. The papers said a

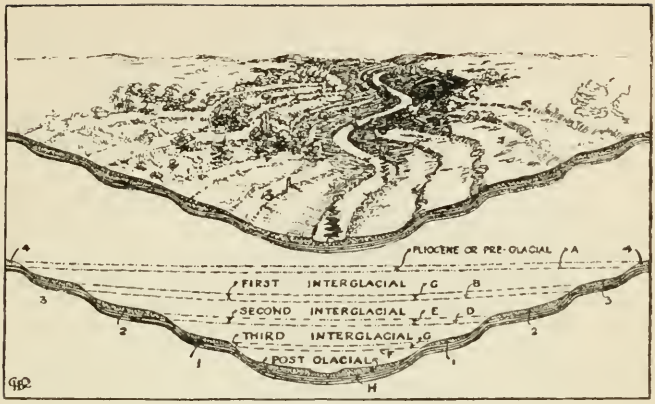

FIG. 6.—The Formation of River Terraces.

glacier had "burst." What really happened was that the rise in temperature caused the Mont Anvers Glacier to melt more rapidly than its accustomed rate of wastage. Masses of ice broke away, and were swept with stone and mud into the valley. Rivers rose, trees were uprooted, and houses carried away. Now think of the whole of the north of Europe under an ice-cap, and the Swiss glaciers extending as far west as Lyons in France, and the temperature gradually becoming warmer. The scientists tell us that it only wants a fall of about 5° centigrade below the mean annual temperature of Europe to have all the rigour of the glacial periods back again, or that a rise of 4° to 5° would cause all the Swiss glaciers to disappear. So that one week rather warmer than usual in the First Interglacial period would have wrought tremendous damage. The new river-bed would have been torn out to level B, and the first layer of gravel formed by the grinding up of the rocks and flints deposited at C. Then perhaps the winter came on or dryer weather. The river shrank, and Strepyan man came down to the water's edge, he wanted to fish or drink ; he may have camped there. In any case he left his tools behind and these were made of flint, and some are found to-day nearly as sharp and perfect as when he used them, neither rolled, nor abraded. The river rose

again, and bringing down more gravel covered up the tools ; sometimes it carried an implement along, and bruising it very considerably in so doing deposited it lower down the river.

In the second terrace (2) are found a few Strepyan tools in the underlying gravels. These may have washed down when the bed E was being formed in Second Interglacial times, because as the bed C over it was being undermined, the Strepyan implements in it may have slid down into the new gravels which were being formed under it. On these gravels sands were deposited, and in these early Chellean implements are found. So man again, during all the long years of the Second Interglacial period, lived on the water's edge of the Somme, and left his tools behind him to be covered up by the gravel deposited in flood times when he had to retreat up to the higher terraces. In the gravels of this terrace are found remains of *E. antiquus*, a southern type of elephant which preceded the mammoth. This shows us that the climate was warm.

In the gravels of the first terrace are found later Chellean implements, and the final gravel bed has not been explored because it is frequently submerged.

It should be noted that disturbances of the level of the earth's surface, in relation to the level of the sea, may have contributed to the formation of river terraces. For instance, well below the bed of the Thames is an old buried channel, in which the river ran, where the land was higher. Any raising of the land's surface would make the river run more rapidly on its way to the sea, and so have more power to cut its way down, and form terraces, or it may have been that the Ice Age locked up tremendous quantities of water, and thus lowered the sea-level. Since Neolithic times there has been little change in the earth's surface.

Fig. 7 shows the terraces of the River Wey at Farnham, Surrey, and we include this because it is nearer home than the Somme, also nearly all the flint implements illustrated in this book have been drawn from specimens found at Farnham. The gravel beds are shown by solid blacks. At A no implements have been found, so this may have been the bed of an enormous river of pre-glacial times which extended as the dotted line right across the country

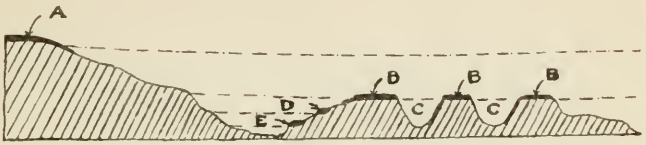

FIG. 7.—The Farnham Terraces.

to Hindhead. The next river formation was on the line B, and of this there are gravel beds remaining on three ridges, valleys between having been cut since to C. D and E show rivers which were gradually shrinking to pigmy dimensions.

It is quite easy to see that such tremendous rivers could not have existed as part of our present river system. These old rivers were ambitious pushing fellows wanting more elbow-room, and this they had. The Thames at London stretched five miles wide between Highbury and Clapham. Europe in Pleistocene times had a different shape, and was a bigger place than it is now, and raised higher above the sea-level. The Atlantic was perhaps 100 miles more to the west: the Mediterranean consisted of two inland seas.

The Irish Sea, English Channel, and North Sea were wide valleys feeding noble rivers. One, which we will call the River of the Men of Galley Hill, had for its tributaries the Thames, Rhine, and Elbe, and it discharged its waters into a northern sea just south of the Faroe Isles. Another, which we will call the River of the Men of S. Acheul, had for its tributaries the Seine, Somme, and all our southern rivers, and flowed westward to the Atlantic through the fertile *lands* of what is now the English Channel. England during some parts of the glacial periods was connected to Europe by a watershed of dry land where the Straits of Dover now are. There was an isthmus across the Mediterranean at Gibraltar, and another south of Sicily. These trackways are very important because by them the Arctic animals could come south when it was cold here, and the southern animals come north when it was warm. This is the explanation of the hippopotamus in England: he did not need to swim, and was not cut out for flying; he walked here. In Aurignacian times the Sahara, till

then a pleasant grassland, became a desert, and this led to the migration of men and animals.

Before we leave the question of rivers and their terraces, we must refer back to Fig. 6. On the upper drawing of the river the gravel of the terraces, which is shown dotted, is overlain by deposits which are shown by hatched lines.

These deposits are in the nature of Loess, or loam, brick-earth and soil washed down by rain, and have been a great puzzle to the geologists. At one time it was thought that great lakes were formed during the temperate periods between the Ice Ages, and that the deposits were made by the settling of the boulder clay which had been dissolved in the water; these would be called lacustrine. Some such cause must be looked for in the thick deposit of brick earth at Caddington, to which we shall refer later, but this could not have been the case at S. Acheul on the Somme. Here, owing to the investigations of M. Commont, it is thought that these deposits on the terraces on the top of the gravel are what the scientists call sub-aerial, that is, deposited on the surface by the wind, as opposed to sub-aqueous, or under the action of water. The Loess, to which constant reference is made by the archæologists, is a greyish-brown sandy and chalky loam deposited by wind in the form of dust. This was caused by the action of frost during a glacial period. As the ice retreated the earth would have been a very barren place. There is evidence that at this period there were great winds and blizzards, which swept over these deserts and blew the dust about. This frequently led to the destruction of animal life, and their bones are found now in great quantities embedded in the Loess. The position of the Loess lands is very important; beginning at the Ural Mountains they stretch across South Russia to the Carpathians and the Danube, then by way of the north-west of Austria through South Germany into the north of France. The Loess did not lend itself to the development of thick forest, so this track remained open as a route for prehistoric man from east to west. Æolian is the term for a deposit laid down by winds; pluvial for that by rain. On the second terrace of the Somme at S. Acheul (p. 11) at its base, on the chalk, are found the gravels with the remains of *E. antiquus*, the southern elephant, and rough flint

hand-axes, or bouchers, of Strepyan times. In the sands over the gravel are early Chellean implements, and these two layers were deposited by water. Then above this we start the sub-aerial deposits. First we have a white sandy loam with land shells. Above this is the older Loess, or Derm, in three layers, consisting of sands, and sandy loams, with gravel at base. Here are found remains of the red deer, and in the upper layer implements of the Upper Acheulean period. Above these three layers come three others of the younger Loess, or Ergeron, each layer divided by thin sections of gravel, in which are found Mousterian implements. Above this comes brick earth, which is weathered Loess, where are found Upper Aurignacian and Solutrean implements, and in the soil washed down on the extreme top there are implements from the Neolithic to the Iron Age. (Refer to Chart and check the order of these industries.)

Think how bewildering it must have been to find all these evidences of ancient civilization in one and the same terrace, because not only were the implements found in the lowermost gravels of a later age as one went down from terrace 3, 2, and 1, but they also were later in each terrace as one approached the surface. It is owing to the genius of the French archæologists that we have found out all this.

In England we have had similar problems. At Caddington, Bedfordshire, Mr. Worthington G. Smith found an actual palæolithic flint worker's working-place, and how he did so is most interestingly told in *Man, The Primeval Savage*. This working-place was buried under brick-earth and clay, at a depth from 4 to 13 feet below the surface. Here Mr. Smith discovered flint implements of Acheulean type, with the anvils and hammer stones which had been used in their production, and specimens can be seen at the British Museum. These are sharp, and have not been rolled. In the 4 to 13 feet thickness of ground *over* these were discovered rougher implements of Chellean type which were earlier in date, and were covered with scratches or abraded, and had been rolled along. The suggestion is that man lived on the lower level, or palæolithic floor, on the banks of a lake, in one of the later interglacial periods, then an Ice Age came on, and he retreated

to sunnier lands. At the beginning of the next interglacial period, a slowly moving, half-frozen mass descended from the higher ground near Caddington, and brought with it these older implements which had been left by earlier men still, and deposited these on the top of the later ones.

If you go to Caddington, you can see by the sections of ground which are visible in the brickyards, how this contorted drift pushed along in a semi-fluid state and then came to rest. Truly, in the Ice Ages the old earth was cut and carved, shaped and modelled in a terrific way.

We may now sum up the problems which have confronted the archæologists in their studies. We started the chapter with William Smith's work on stratification, and this has enabled the scientist to gauge the age of sedimentary rocks by measuring the rate of deposit in modern formations. On p. 5 how the astronomers help by their calculations of alterations of the inclination of the earth's axis; and on p. 8 how the girdle moraines of old glaciers and their connection with the river terraces give another clue.

Another method may be instanced. The scientist finds that there has been little, if any, difference between the appearance of men and women, or the domestic animals, of the time of ancient Egypt and our own day. This being the case, the Piltdown man (shown p. 21), *E. antiquus*, and the sabre-toothed tiger must be very remote, though it must be borne in mind that sudden changes of climate would have correspondingly rapid changes of men and animals.

Out of all these facts, the archæologists have endeavoured to form a scale of time by which to measure the age of these prehistoric civilizations, and this we have incorporated in our Chart. It should not be taken too much to heart, and need not disturb any boy's or girl's Faith; it seems to us a splendid picture; all these thousands of years, and man moving through them alert, resourceful, and plucky, and on an upward path!

FIG. 8.—Pithecanthropus, the Sub-man of Java.

CHAPTER II

THE STREPYAN, CHELLEAN, AND ACHEULEAN MEN OF THE OLD STONE AGE

WE can now pass to a consideration of the most interesting part of our study—Prehistoric man. What did he do on the banks of the Somme, the Thames, or the Wey; how did he fend for himself, his wife, and children? Or did he at first look after himself, and preach the doctrine of self-help to the family? Perhaps before we endeavour to sum up his doings, it will be well to take stock of his scanty belongings.

Having done this latter, we shall then have to look about

for a model to help us. A painter uses a dummy which he calls a lay-figure; this he dresses up and poses for the picture. In the case of prehistoric man, our model must be drawn from the savage races of modern times; and remember there are still people who use stone, because they cannot work iron, but such types are few and far between now, and have lost their old self-reliance and interest by contact with civilization. Obviously we cannot draw any useful comparisons between prehistoric and civilized man; they are poles apart so far as their lives are concerned; but, if we go back a little to the earlier voyagers, we can find records of people who were still living as simple and primitive a life as the prehistoric men.

Darwin started on his epoch-making voyage in the *Beagle* on the 27th December 1831. He was not quite twenty-three, and was away for nearly five years, during which time he went round the world, and saw many native races. He wrote his book on *The Voyage of the Beagle* on his return, and if any boy or girl has not read it, it is a defect which can be speedily remedied, because there is a cheap edition in the "Everyman" series. We shall draw on Darwin, then, for comparisons. Even before his time the poor Tasmanians had been banished to an island, and had ceased to exist as a nation. They were an exceedingly primitive people, and fortunately for us Mr. H. Ling Roth's book on the *Aborigines of Tasmania* contains a most graphic and interesting account of all that went to make up their everyday life. Messrs. Spencer and Gillen's books have been drawn upon for details of the native Australians. Now for prehistoric man himself.

We have referred to the archæologist as a pick and shovel historian, because he digs for his knowledge. This means he digs for what is left of man. It is rather sad that man does not lend himself to the fossilization of his remains. He has always been a restless individual. The lower animals in kindly fashion seemed to arrange that their bodies might sink in the water, settle in the mud, and become beautiful fossils. This often came about as the result of drought—the poor beasts maddened by thirst would dash into the muddy bed of a river, and be too exhausted to pull themselves out. That they did so, has enabled us to find out about them. Man did not do

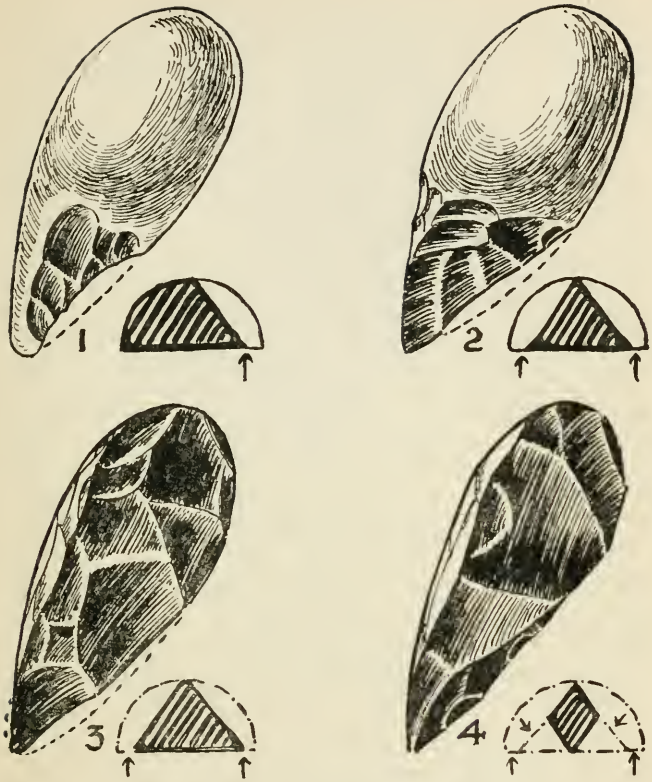

FIG. 9.—A Theory of Flint Flaking.

this ; he was too busy or too careful, and died out in the open ; just dropped in his tracks, and did not think how inconvenient it would be for us—this neglect on his part to become a fossil. So his remains are very seldom found.

We have made a series of drawings of the types of skull which are known, and which are being referred to constantly by the archæologists, and which our readers are sure to meet if they begin to study seriously. Fig. 8 is of the *Pithecanthropus erectus*, or the first of the sub-men.

In 1891 Prof. E. Dubois found the roof of a skull, two molar teeth, and a thigh-bone (femur) at Trinil in Java. The position is interesting because of its relation to Australia and Tasmania. The remains were found in river deposit of late Pliocene, or early Pleistocene, character. These were found in conjunction with the bones of many of the lower animals of the same period ; but there were no implements.

The brain-pan of Pithecanthropus exceeds that of any ape, and equals about two-thirds that of modern man. Prof. G. Elliot Smith thinks that its features prove that the man belonged to the human family, and enjoyed rudimentary powers of speech. Darwin, writing of the Fuegians, said: "The language of those people, according to our notions, scarcely deserves to be called articulate. Captain Cook has compared it to a man clearing his throat, but certainly no European ever cleared his throat with so many hoarse, guttural, and clicking sounds." The thigh-bone of Pithecanthropus shows that he walked upright, but the teeth are more simian than human. Pithecanthropus was a link between gibbon and man. He probably retreated to the trees when he was alarmed, and may have contrived rough shelters or nests there, but of this, of course, we cannot be sure. The scientists went to Java because Europe was deserted by the man-like apes in early Pliocene times, as the temperature became colder. A more genial climate than ours was necessary for the development of this link, which, with brain, added to bone and muscle, was to connect them with us.

It is sad that Prof. Dubois could not find any tools or implements associated with Pithecanthropus, because it might have helped to clear up the knotty question of the Eoliths. These are very primitive flint implements (see Fig. 9), which one school of archæologists say must have been made by very primitive men ; the opposing school contesting that they have been produced by natural causes.

Our readers will, we think, agree with us that the early flints (as Fig. 18), the human origin of which is unquestioned, could not have been produced at once. Thousands of years in all probability passed before early man got into his dull head the idea of shape. At first he must have

FIG. 10.—*Eoanthropus Dawsoni*, the Piltdown Man.

used any stick, stone, or shell that came handy. Probably happy accident came to his aid ; he broke a flint and found that it had a keen cutting edge. At the identical moment that it occurred to him to turn this flint into a rough tool by trimming it into shape, he took the first step towards civilizing himself.

When man discovered the use of fire, he had an ally which not only cooked his food and warmed his body, but would at the same time have sharpened and hardened a stick of wood, so that it could be used as a spear. Put any piece of wood in a fire and char the end ; when scraped it is pointed in shape.

In *Pre-Palæolithic Man*, by Mr. J. Reid Moir, an interesting suggestion is put forward as to the development of the flint implement. We have made a drawing (Fig. 9) to illustrate this. Mr. Moir thinks that primitive man first used a split flint as 1. Its base would have had a sharp edge all round. Perhaps in use this edge got chipped, with the result that it became sharper. The flaking may then

have been developed by man to make a scraper. In 2 this is done on both sides, with a resulting third edge or keel. By flaking all over the face 3 was obtained, and this is called the rostro-carinate type. 1, 2, and 3 all have flat bases. In 4 the edges of the base have been knocked off, and a type is obtained which is like the Chellean implements we shall see later.

Fig. 2 gives a rostro-carinate or eagle's beak flint in more detail.

Our drawing of Pithecanthropus (Fig. 8) has been based on the plaster cast at the Natural History Museum at South Kensington. Here can be studied the fossil remains of man, and there is a fine collection of casts of primitive skulls. In drawing from these, it is evident that one may obtain an expression of character which may be either too brutal or too civilized, but the shape of the skull remains, and this determines the poise of the head, and many general characteristics of the face. We do not know if Pithecanthropus ever lived on the banks of the Somme, or Thames, because no human remains of his type have been found in England. His cousins may have existed nearer the equator in Africa, and their descendants then have found their way across the isthmus we referred to into Europe.

Our next illustration (Fig. 10) is of a very celebrated person, the Piltdown Man, *Eoanthropus Dawsoni*, or the Man of the Dawn, so named after his finder, Mr. Charles Dawson. We should be very proud of Eoanthropus, because he is the first known Englishman. In 1912 men were digging for gravel, and came across a skull which they broke up and threw away ; a rather brutal thing to do, and in this case supremely foolish as well. One piece of the skull came into the possession of Mr. Dawson, who, recognizing its value, at once made search for the remaining portions. Other parts of the skull were found, a lower jaw, and later on a canine tooth. Since 1912 scientific men all over the world have written articles, indulged in friendly controversy, and found out all sorts of things about the Piltdown man. The remains were found in old river, or plateau, gravels, at Piltdown in the Sussex weald, the age and formation of which is uncertain, but in the gravels are fossil remains of animals dating from late Pliocene,

and early Pleistocene, times, and as well the roughly worked flints called Eoliths; and some later ones, Palæoliths of an early type. Both the fossil remains of the late Pliocene and the Eoliths are much water-worn and rubbed, as if they had been rolled along, whereas the early Pleistocene fossils and the early Palæoliths have sharp edges and are not water-worn.

FIG. 11.—The Piltdown Man's Bone Implement.

From these facts the scientists assume that the Pliocene fossil remains and the Eoliths are older than the gravel, and were brought down by early rivers from some other land surface, as at Caddington (p. 16), and deposited with the stones which form the gravel. It is further assumed that the Piltdown man, and the Pleistocene fossil remains, and the early Palæoliths may be of the same age, Early Pleistocene. Boys and girls can judge this for themselves, because at the Natural History Museum at South Kensington, in the gallery of Fossil Mammals (Table Case 1), they can see a plaster cast of the skull, and the various fossil remains under it.

If this is so, then the Eoliths have to be accounted for, and must have been produced by some ancestor of the Piltdown man, who might have resembled the Java sub-man; though unfortunately no earlier human remains than the Piltdown man have been found in this country, and the Java man forgot to have his implements at hand when he started to become a fossil.

To revert to the skull, the Piltdown man is altogether a much more presentable person than his Java ancestor; he had a respectable forehead—a better one, indeed, than the Mousterian man of Neanderthal type whom we shall meet later on. The brain capacity is about 1300 cubic centimetres, which is about equal to the smaller human brain of to-day; but with this evident increase in brain power, he still retained a very animal lower half to his face. The canine tooth is ape-like in shape, and would

have been used as a weapon for offence or defence. The jaws stick out and give the face what is called a prognathous character. The skull is extraordinarily thick, 10 to 12 millimetres, as against 5 to 6 in modern man. The Piltdown man could, and probably did, butt a rival away, but notwithstanding all this he was on the upward grade.

The skull is what the scientists call mesaticephalic in shape, cephalic index about 78, and, as we shall be constantly meeting this and other terms used in relation to skulls, we will explain them now. The cephalic index is the ratio or percentage of the breadth of the head to the length, the latter being taken as 100.

Skulls with index of 70–75 = Dolichocephalic (long).
,, ,, ,, 75–80 = Mesaticephalic (intermediate).
,, ,, ,, 80–85 = Brachycephalic (round).

For example, assuming a skull has a breadth of 135 millimetres and a length of 180, we get $\frac{135 \times 100}{180}$ = cephalic index of 75. If our readers have a large pair of calipers, they can measure up their friends, and inform them what their cephalic index happens to be.

One detail about the Piltdown man is, that the scientists think, by the shape of his brain, that he was right-handed. This makes him seem much more intimate.

As well as the Eoliths and Palæoliths, Mr. Dawson discovered a very extraordinary implement made of the thigh-bone of an elephant, and this cannot be later than early Pleistocene, because the bone of which it is made came from *Elephas meridionalis*, or *E. antiquus*, which lived in Europe in late Pliocene or early Pleistocene times. There were larger elephants than the Mammoth, who comes later, and had need to have been to provide thigh-bones of sufficient size to make this implement. It is 16 inches long, 4 inches wide, and 1 to 2 inches thick, shaped rather like the blade of a bat, and not water-worn ; so like the early Palæoliths its age must be the same as the gravel in which it was found. The use of the implement is unknown. There is a model of it at the Natural History Museum, and we give a cut (Fig. 11) which has been

FIG. 12.—Piltdown Man making Flint Implement.

FIG. 13.—Making Fire.

drawn from this. It will be noticed that the implement appears to have been perforated at one end, so a thong may have been attached here, and the implement thrown at small game, and then retrieved from the thick undergrowth by being hauled back, but this sounds a clumsy way when stones were at hand.

Our next drawing (Fig. 12) looks rather like a new design for the four of spades. This is not the case ; it shows the Piltdown man making flint implements. The ones illustrated are about 3½ inches long. The stone held in the right hand acted as a hammer, and with this flakes were knocked off, and shape given to the implement. Flint flaking is an art, as can be easily tested by trying to make an implement oneself. It is a comparatively easy matter to strike off a flake, but a very difficult one to shape it. The actual idea of symmetry marks a great advance, and is the beginning of a sense of proportion ; a feeling that the implement will not only cut as well as the rough flake, but that it would look better, and be more pleasant to

handle, if it were shaped. It is this shaping which makes us feel that the Eoliths must have been made by humans, because we cannot believe that they would arrive at the stage shown in Fig. 12 without endless experiment.

These flints of the Piltdown man are presentable looking objects; he has begun to take a pride in his work, which, when you come to think about it, is the most satisfactory emotion that boy or man can experience.

Fig. 14.—Strepyan Boucher or Hand-axe.

These implements would have had all sorts of uses. Flint can be made as sharp as a razor, and they served as the knives of the day, and were used to cut up a beast, scrape a bone, dig up pig-nuts, or shape a stick. Flint is extraordinarily hard—until quite recently it was used in connection with steel and tinder to produce fire. If a piece is struck against steel, minute fragments of the latter fly off, heated by the blow to such an extent that they burn in the air as sparks. Prehistoric man probably obtained his fire in this way, using, instead of steel, marcasite, an iron sulphide found in association with flint, or he may have done so by friction, rubbing one piece of wood up and down in a groove in another piece, until the dust ignited (see Fig. 13).

We will now refer back to our diagram (Fig. 6), and go into the detail of the implements which are found on the banks of the Somme. In the gravels of terrace No. 3, the worked flints are said to be of Strepyan, or Pre-Chellean, design. Strépy is a place in Belgium. The implements are roughly flaked, and generally have some part of the original crust remaining. Fig. 14 shows a rough form of boucher, a term invented by Prof. Sollas, in honour of M. Boucher de Perthes, who first found worked flints on the Somme (p. 9). The French call this a *coup de poing*; hand-axe is another term. The boucher was held in the hand, but, we think, not as a dagger, point down; we say this, because in the collection of our friend, Harold

FIG. 15.—*Machærodus*, the Sabre-toothed Tiger.

Falkner of Farnham, all the points are intact, and only the side edges show signs of wear. We think the butt was held in the palm of the hand, with the first finger along one edge, to cut with the other.

Strepyan man also used flints fashioned for scraping fat off the skins of the animals he killed, and the bark off all the odd pieces of wood that he must have needed. His spears would have been of wood. When he lived on the banks of the Somme in the First Interglacial period, he had as companions two huge elephants, *E. meridionalis* and *E. antiquus*; the hippopotamus, rhinoceros, and sabre-toothed tiger; and a horse, *E. stenonis*. The naturalists tell us that the teeth of *E. antiquus* were adapted to eating the small branches and foliage of trees. This gives an interesting indication of the Strepyan climate. It must have been warm and genial for these southern animals to have flourished.

How man fended for himself we cannot tell, armed only with a boucher, which he perhaps hafted as a spear; he could have but little chance against an elephant, 15 feet high to the top of the shoulder.

If looks are any criterion, the sabre-toothed tiger, *Machærodus* (Fig. 15), must have been an evil beast. There is a plaster cast of one at the Natural History Museum. Machærodus was widely distributed and existed in England with the cave men who came later on; this we know

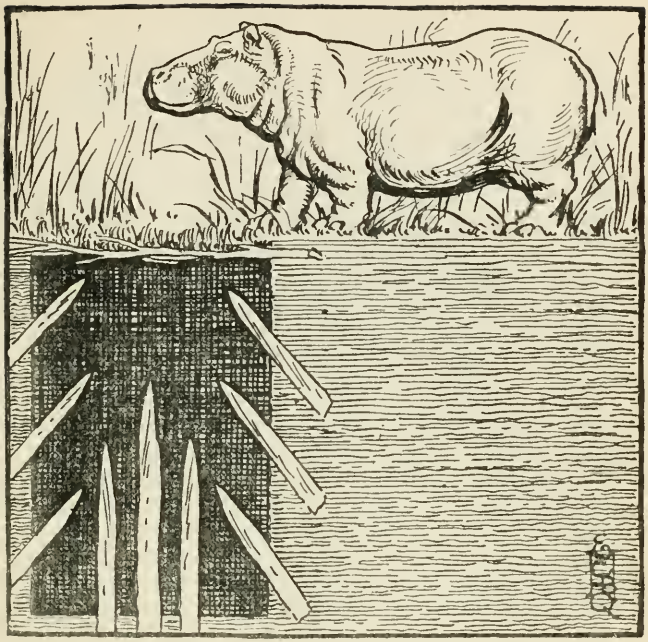

Fig. 16.—The Pitfall.

because his teeth have been found in Kent's Cavern and Cresswell Caves. Man could only have combated such animals by craft ; fire and traps were his weapons, and one expects that he was not too proud to eat the remains of the tiger's feast. Fig. 16 is of a pitfall in use by the natives of British East Africa. Labour was plentiful in Strepyan days, and everybody lent a hand. To dig the pit would not have been beyond the wit of prehistoric man, and the stakes could have been sharpened and the points hardened by fire. Such a pit would have been a beginning of the long battle between brain and mere bulk. This would have been one way in which prehistoric man obtained the meat that he needed for his food. He was, of course, as carnivorous as his foe the tiger. He

possessed neither flocks, nor herds, and did not grow any corn.

Darwin tells us that "the Gaucho in the Pampas, for months together, touches nothing but beef. But they eat, I observe, a very large proportion of fat."

Again, Darwin gives us a splendid picture of how to support life, when there is not a butcher's shop just round the corner, but you have to catch your supper before you can cook it. He was in the Falkland Islands at the time. His Gaucho separated a fat cow from a herd of wild cattle, and caught it with his *lazo*. It was then ham-strung, and killed by driving a knife "into the head of the spinal marrow." These details are given because, when you are a prehistoric man, you can't afford to be sensitive. A large circular piece of flesh was then cut out of the back, with the skin attached; this was roasted on the embers, with the hide downwards and in the form of a saucer, so that none of the gravy was lost.

Though the weather was wet, the Gauchos managed to light their fire. First with their flint and steel they get a spark on to their piece of charred rag or tinder. Then "they sought beneath the tufts of grass and bushes for a few dry twigs, and these they rubbed into fibres; then surrounding them with coarser twigs, something like a bird's nest, they put the rag with its spark of fire in the middle and covered it up. The nest being then held up to the wind, by degrees it smoked more and more, and at last burst out in flames."

For fuel the Gauchos "found what, to my surprise, made nearly as hot a fire as coals, this was the skeleton of a bullock lately killed, from which the flesh had been picked by the carrion hawks."

Darwin enjoyed his supper, and recommended "*carne con cuero.*"

Chellean Man

The next stage in man's development, which is recognized by the archæologists, is that called "Chellean." This name comes from Chelles, on the Seine, near Paris. There has been considerable controversy as to what Chellean man was like. Here in England at Galley Hill,

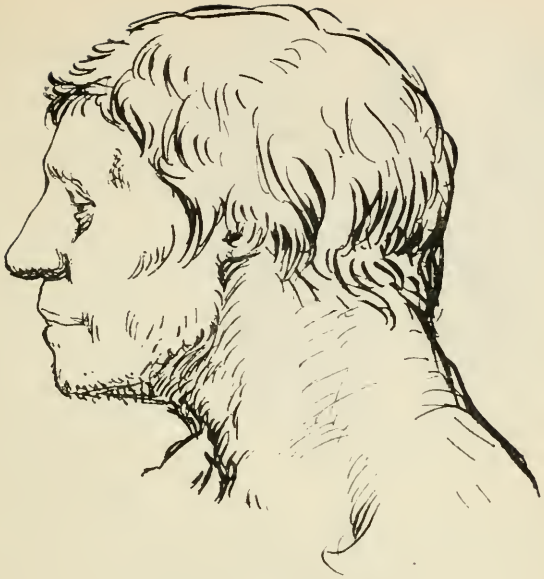

FIG. 17.—Galley Hill Man.

Swanscombe, Kent, a skeleton was found in 1888, which we illustrate (Fig. 17), and which Sir Arthur Keith contends is that of a Chellean man. The head is of great length, but not very high. The skull is very thick, the eyebrow ridges not nearly so much developed as in the later Neanderthal type. The chin is beginning to be quite modern, but the teeth are primitive. It may well be that here in England in Chellean times the men were developed who in the end became *homo sapiens*. Chellean implements are found at Swanscombe which correspond to those found in the sands above the lower gravels of the second terrace of the Somme (Fig. 6). Later types are found in the first terrace.

The boucher (Fig. 18) has developed since Strepyan times. It was still formed by knocking flakes off a flint nodule, and remains the most useful tool of prehistoric man; but the Chellean boucher is quite a well-made implement,

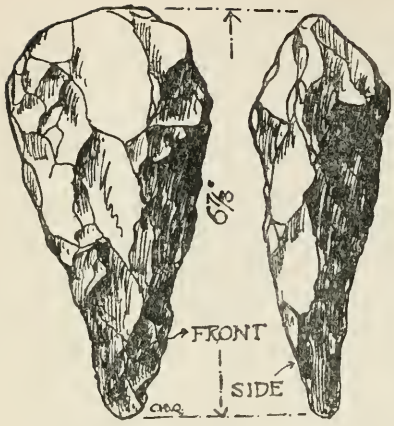

FIG. 18.—Chellean Boucher or Hand-axe.

and the man who made it was becoming a good craftsman. His flint work was far in advance of that of the Tasmanians. Sometimes it has a thick butt end, and a longer point, while others are oval in shape, as Fig. 19. The earlier the type, the thicker the implement. Fig. 20 shows a woman using a flint scraper, one of the most useful implements of prehistoric man.

The people who know how to make these flints were widely distributed. Prof. Sollas says that bouchers are found in all the continents of the world, except Australia.

Many hundreds of flint implements are often found in the same gravel pit, and this is thought to prove that large numbers of prehistoric people camped together. This is doubtful; food was scarce. It is, of course, always difficult to remember that an interglacial period extended over thousands of years, so that if a river bank was a favourite camping-place, the tools could have been dropped year after year, and covered up by gravel and sand in times of flood. We dig these to-day, and forget the long time which it took for the gravel to be deposited. Another point to be borne in mind is that, so far, all the remains of prehistoric man that we have noted have been found near water. The men of the river drift had to camp by the side of a river, or lake, because they had not any pots or pans in which to store water. Thousands of years passed before man made pottery.

Another point to remember is, the one which was pointed out to the nineteenth-century geologists, in regard to the same sort of fossils found in the rocks in different

parts of the world: these were not all living organisms at the same time. Life proceeds from a centre and spreads. So this widely distributed Chellean civilization did not start all over the world at one given minute. If it started in India, or Africa, it took time for it to reach the Wey, by the isthmus across the Straits of Dover. Prehistoric man was a great traveller, and that by the most urgent necessity of all: the need to find food. Darwin mentions two Spanish girls taken captive by Indians. "From their account they must have come from Salta, a distance in a straight line of nearly 1000 miles. This gives one a grand idea of the immense territory over which the Indians roam." So it was with prehistoric man. Remember he started as a hunter, then developed into a herdsman, then became a farmer, and settled down to guard his possessions. Remember as well that we call the industry Chellean, not because it originated at Chelles, but by reason of the wonderful way the French archæologists have explored the remains of prehistoric man; they have done this so well that we have adopted their names for want of better ones of our own. England must have been an outpost of Chellean civilization.

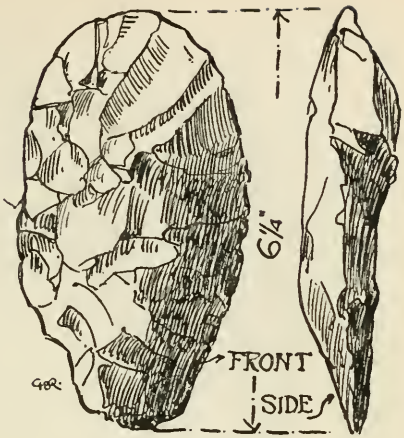

FIG. 19.—Oval Implement.

Chellean man had to encounter much the same sort of animals as those of Strepyan times. The huge *Elephas antiquus* remained as a problem for the hunters to tackle. They probably employed the pitfall to trap animals; the Australians still catch emus in this way, or they may have

Fig. 20.—Chellean Scraper.

been the inventors of another device which is still employed by native races. This consists of a large and heavy piece of wood, which is suspended above a path, pointing downwards, by a grass rope. Fig. 21 shows how the animal, pushing its way along, cracks the rope, with the result that the spear falls on to the spinal column.

We may turn to Darwin to gain information as to the appearance of savage races. Writing of the Fuegians he

said: "Their only garment consists of a mantle made of quanaco skin, with the wool outside; this they wear just thrown over their shoulders." But the skin cloak appears to have been a party frock, and not for general use. Darwin saw them in their canoes; the sleet falling, and thawing on their naked bodies. He refers to the Fuegian wigwam which "resembles, in size and dimensions, a haycock. It merely consists of a few broken branches stuck in the ground, and very imperfectly thatched on one side with a few tufts of grass and rushes. . . . At Goeree Roads I saw a place where one of these naked men had slept, which absolutely offered no more cover than the form of a hare."

FIG. 21.—Falling Spear.

The Tasmanians made much the same form of shelter, using bark instead of grass and rushes, and we have shown the type in Fig. 22. Treat the drawing with respect, because it shows house No. 1. They also went about quite naked, using occasionally a fur cloak. Both the Fuegians and the Tasmanians liberally anointed their bodies and heads with grease mixed with the ochreous earths. In this way they gained a certain protection from the weather, and it helped to keep them clean. Earth is a fine deodorizer. There is a good tale told of a party of Tasmanians given some soup, on the top of which floated fat; this they scooped off with their hands, and put on their heads, but they did not drink the soup. Primitive man almost invariably roasts or bakes his meat.

Later on we give instances of human remains being

Fig. 22.—A Break-wind.

found, buried with red ochre, for use in the spirit world. This points to the covering of grease and ochre, having developed from a protection into a decoration of the body.

Darwin wrote of the Fuegians: "The old man had a fillet of white feathers tied round his head, which partly confined his black, coarse, and entangled hair. His face was crossed by two broad transverse bars; one painted bright red, reached from ear to ear and included the upper lip; the other, white like chalk, extended above and parallel to the first, so that even his eyelids were thus coloured."

We have just referred to skeletons being found with colour for decorating the body, and implements for use in the spirit world, and such burials point to a belief in a future life. But we can find no traces as yet of such a belief on the part of the Chellean man. Captain FitzRoy of the *Beagle* could never ascertain that the Fuegians had any distinct belief in a future life. When driven by extreme hunger they killed and ate the old women, before their dogs, because, as they said, "Doggies catch otters, old women no." In the Uganda, before a human sacrifice, the victim was made to drink from a magic cup to destroy his soul first. A horrible idea, but yet proving that even

the most degraded types as a rule believe in a future life.

As to what the Chelleans believed, we cannot say.

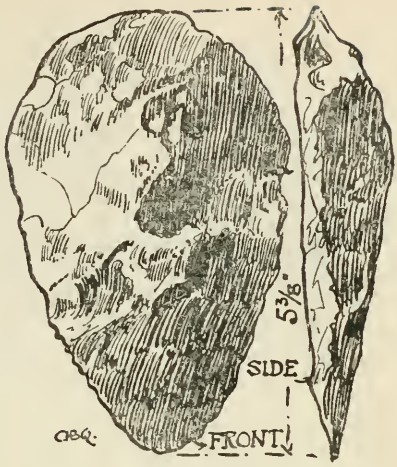

Fig. 23.—An Acheulean Boucher or Hand-axe.

Acheulean Man

We can now turn to Acheulean types of implements. Here we still have the boucher (Fig. 23), but it is a much better one ; thinner and more finely flaked, with a truer edge. Scrapers were used as well, but Acheulean man does not seem to have had many more sorts of implements than his Chellean ancestor. It must be borne in mind that these names are terms used to denote certain stages in the development of flint implements. In reality the design of these was a continued growth, and prehistoric man did not, in any one year, leave off making Chellean types and introduce a new Acheulean fashion.

In the description of the sub-aerial deposits on the terraces of the Somme (p. 14), we noted that the earliest Acheulean types are found in the sands and gravels at the base of the lower Derm, and the later types in the lowest strata of the older Loess. This older Loess is in three layers, and in the middle and upper layers no implements are found. It is supposed to have been deposited in glacial times, so it seems as if the weather gradually became too cold for man to camp by the riverside. This view is borne out by the remains of the animals found and in the implements. In the sand and gravel of the earlier Acheulean times, we have our old friend *E. antiquus* and the red deer, both southern animals ; but in the later

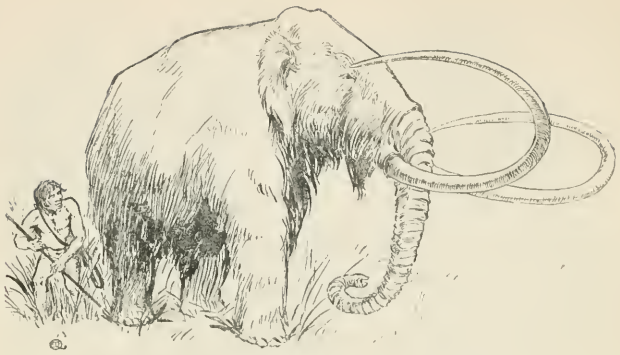

FIG. 24.—*Elephas primigenius*, the Mammoth.

Acheulean of the lowest layer of the older Loess, we meet for the first time, *E. primigenius* (the mammoth), *Rhinoceros tichorhinus* (the woolly-coated one), horse, and lion. These were northern animals who came south as the weather became colder and the Fourth Glacial period drew on.

The mammoth was not so large as *E. antiquus*, and closely resembled the existing Indian elephant, excepting only the tusks, which are very long and curved. Its teeth were more adapted for eating coarse grasses than the foliage of trees. The country was becoming barer and bleaker, and trees were scarce. Its curved tusks perhaps acted as hay-rakes, and helped to gather up food. Its warm coat and thick skin, with a layer of fat under, protected it from the cold weather. We know all about the mammoth, because whole carcases have been dug up in the frozen Arctic regions, with the flesh, skin, and furry coats, protected through the ages by the ice and snow in which they were embedded. Our sketch (Fig. 24) gives a general idea of this animal, and Fig. 25 shows the woolly-coated rhinoceros.

If reference is made to the Chart, it will be seen that during Acheulean times the weather was getting colder, and as the ice-cap crept down, so these animals from the northern regions retreated before it. Man appears for the same reason to have looked about for warmer shelter

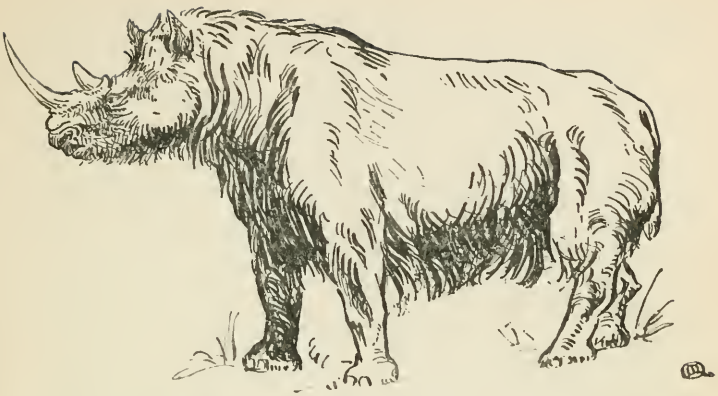

FIG. 25.—*Rhinoceros tichorhinus*, the Woolly-coated Rhinoceros.

than the open-air camps, and to have retreated to the caves and caverns.

Before we pass on to the Cave-dwellers, let us sum up what we have found out about prehistoric man, and draw some comparisons. We say that he was a nomad and a hunter, but unless we are careful to think a little, the mental picture we form is of some one rather like ourselves ; a little rougher perhaps, and more whiskery, but with a background of solid comfort somewhere. We shall be right in imagining the Chellean a man like ourselves, with an active brain, but comfort as we understand it did not exist for him.

We do not realize that prehistoric man was a nomad, or wanderer, because he had to hunt for his food ; that unless he hunted he starved. It is really extremely difficult to imagine a state of affairs when a man's sole possessions consisted of a flint boucher for tool ; a wooden spear for a weapon, and a skin for covering ; when all else had to be searched for ; when pots and pans did not exist ; when pottery and weaving had not been invented. Yet such people have existed until comparatively recent times. Tasmania was discovered in 1642, by Abel Janszoon Tasman, who named it Van Diemen's Land, after Anthony Van Diemen, the Governor of the Dutch East Indies.

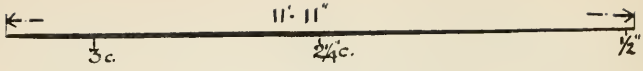

FIG. 26.—Tasmanian Spear.

In an amusing way it has been renamed after its discoverer. After his time Tasmania was visited by other voyagers, Captain Cook being one in 1777, and they found the Tasmanians to be to all intents and purposes a prehistoric people. It seems as if, in remote ages, when Asia, like Europe, had a different coastline, the Tasmanians had come from the mainland into Australia and, retreating again before stronger races, found their way in the end into Tasmania, before it was so much cut off as it is now. There may have been an isthmus across Bass Strait, as there was in Europe across the Straits of Dover. At some later period this disappeared, and the Tasmanians were left free to remain the simple primitive folk they were when first discovered.

They had not the use of iron, and their only tools were made of flint, and very rough ones at that. They had not any "boucher" which was as good a piece of work as that of Chellean man (Fig. 19). Generally the Tasmanians went about quite naked, but on occasions wore a skin cloak. Kangaroo skins were dressed as rugs to sit upon. Wet and cold did not appear to harm them, and their houses, as Fig. 22, were the merest break-winds. When in 1831 the miserable remainder of the natives were exiled to Flinders Island, and lodged in huts, it was found that they caught cold far more readily than when living in the open. Like the Fuegians in their native state, they greased their bodies, and anointed themselves with red ochre; this gave a certain protection. They were also fond of making necklaces of shells, and ornamented their bodies by forming patterns of scars (cicatrization) left by cuts made with a sharp flint. They were nomads moving about the country in search of food; this meant that in hard times the very old and infirm people were left to die, and sometimes the babies had to be sacrificed.

In hunting game like kangaroo they used plain spears, as Fig. 26, made of a hard wood. This is not quite the

simple thing it seems. Pithecanthropus would have picked up any long stick to hit with, and it may have slipped from his hand. He then discovered that unless one end was heavier than the other, it did not follow a very straight line of flight ; it might knock down a bird, but would not pierce with its point the skin of an animal, so through the long ages the Tasmanian spear developed. This was cut, trimmed, and scraped with flint. Straightened by being passed over a fire, the teeth were used instead of the later shaft-straightener (Fig. 46). The end was charred by fire, and so hardened, and then pointed by scraping. The point was at the heavy end ; 20 inches from this the circumference was 3 inches, in the middle 2¼ inches, and 2 inches from the end only ½ inch. The total length was 11 feet 11 inches. The Tasmanian could throw this, and kill an animal at from 40 to 50 yards, and did not use a throwing-stick, as Fig. 34. Unlike the Australians they used neither boomerangs nor shields. Their other weapon was the waddy, or wooden club, about 2 feet 6 inches long, and they threw stones with great accuracy.

The Tasmanian wooden spear had its counterpart in England in the Old Stone Age. In a very interesting book just published, written by Mr. O. G. S. Crawford, and called *Man and his Past*, is an illustration of what is probably the only known palæolithic wooden object. It is apparently the broken head of a wooden spear about 15 inches long, pointed at one end, and about 1½ inch diameter at the other. It looks exactly as if the end had been broken off the Tasmanian spear (Fig. 26), and was found at Clacton in Essex, in the *E. antiquus* bed in association with an early type of flint implement.

It may well be, that here in England, Chellean man hunted and killed smaller game than this southern elephant ; to have attacked *E. antiquus* with such a spear would have been to add so trifling an injury to such a tremendous insult, that the huge beast would have turned on the hunter with disastrous results ; probably the pitfall was the method adopted (p. 29).

We think the illustration in Mr. Crawford's book is the first which has appeared of this Clacton spear. The book itself consists of a series of brilliant essays on the whole Art of Archæology, and should be read by any boy,

or girl, who wishes to acquire the proper atmosphere for more detailed study.

The Tasmanians were wonderful trackers, with very acute sight, hearing, and smell.

They ate the animals and birds they caught. Without any preliminaries these were thrown on to a wood fire which singed the hair and feathers and half-cooked the carcase. Then the bodies were cut apart with a flint and gutted, and the cooking finished off by spitting the joints on sticks, and toasting over the fire. A little wood ash served instead of salt. The meat was always roast, because there were not any pots to boil in.

The Tasmanians ate shell-fish as well, and these the women caught by diving into the sea and searching the rocks under water. They had not any nets, hooks, or lines. The women were not treated very well, and had to do all the other work while the men hunted. They sat behind their lords at meals, who, reclining on one arm in Roman fashion, passed the tougher morsels to their dutiful spouses.

The Tasmanians had one notable possession in their raft. This was not hollow like a boat, but made of cigar-shaped rolls of very light bark like cork. One large central roll had two smaller ones lashed to it with grass rope to prevent rolling; see section on Fig. 27. So that it was a raft in canoe shape. With these, or in them, they crossed from headland to headland, and the type may have been a survival of the earlier boats by which their ancestors found their way down from the mainland, and bridged the gaps between the islands, if the isthmus we referred to on p. 40 did not exist.

This raft is of great interest, because at some time or other it must have been a notable development. Pithecanthropus, if he ever went boating, did so on any floating log, and discovered to his disgust that it needed pointing, if it was to be paddled along, and also that some sort of arrangement was necessary to prevent it rolling over in the water, and giving him an involuntary bath. The beginning came in some such way. One development was the dug-out, and certain prehistoric men, with fire and flint, shaped and hollowed their log in this way.

The Tasmanian was another and very much readier

method. The rafts were used for fishing, and carried three to four men comfortably; the spear, which was their only fishing implement, served as well for a paddle. A clay floor was made at one end, and here a fire was lighted.

It is difficult for us to realize, with matches at hand, what a precious possession fire was to any primitive people. To obtain it they had to follow the method Darwin saw practised by the Tahitians. "A light was procured by rubbing a blunt-pointed stick in a groove made in another, as if with the intention of deepening it, until by friction the dust became ignited" (Fig. 13). It must have been a difficult business, depending on a supply of dry moss, or fibrous bark, which could be lighted from the dust set on fire by friction. The Tasmanian then carried his fire about with him in the form of decayed touchwood, which would smoulder for hours, and could then be blown into flame.

They made grass rope and string, by twisting long wiry grass or fibrous bark, as Fig. 28. This illustration is of great interest, in that it leads up to the development of the spinning spindle shown in Fig. 40. Primitive man, of course, used sinews and hide thongs for ties. They also made clumsy reed baskets, and at the British Museum is a water-carrying vessel, made by skewering up the corners of the leaf of a large seaweed kelp. It looks rather like a mob-cap. With a grass rope they climbed high trees. They passed the rope round themselves and the tree; cut holes in the bark for their big toes, first on one side, and then the other, and as they went up, jerked the rope and themselves up the tree together.

It is not known if they had any idea of trade or barter, but they did not grow any crops, or possess any domesticated animals. They were without any overlords, laws, or regular government.

If they ailed, an incision was made in the body, to let the pain escape. The dead were sometimes burned, and sometimes placed in hollow trees. After burning, the remains might be buried, but the skull retained and worn as a memento, or at other times this was buried separately. They believed in a life after death on a pleasant island with their ancestors.

We will finish off this account of the Tasmanians, by an amusing description of one of the ways they had of settling their quarrels: "The parties approach one another face to face, and folding their arms across their breasts, shake their heads (which occasionally come in contact) in each other's faces, uttering at the same time the most vociferous and angry expressions, until one or the other is exhausted, or his feelings of anger subside." An extremely sensible method, and amusing for the onlookers, which is more than can be said of civilized methods of quarrelling.

It is not very creditable to the civilized white races, that the Tasmanians should have been used so badly that they have now become extinct. Truganini the last survivor died in 1877, and, we hope, found the dream of the pleasant island and the kindly ancestors come true. A nation can die of a broken heart, even as individuals; or shall we say, they lose heart. Think of a people who have supported life with no other aid than spears, waddies, and chipped flints, then other people come in ships, with a wonderful apparatus for living, which makes the sticks and stones seem foolish and inadequate. Thus the old people lose interest, and heart, and the desire to go on living, or become hangers-on, and so come to an end. All of which is very sad.

We have written enough to prove that Chellean and Acheulean men, in their flint bouchers, possessed tools with which they could make the spears that they needed to kill game for food; their mode of living must have been very similar to the Tasmanians. Shall we now try to conjure up a picture of a tribe here in England in Chellean and Acheulean times, and find out if we can how they supported life?

The tribe was like a large family in those days. There might have been a headman, who would have been the boldest of the hunters, but little if any system of government. The women did all the work, and looked after the children, and meant more to them than the father, whose place was with the hunters. So much was this the case that the custom grew up in savage races of tracing descent on the mother's side.

The tribe would not have been particularly quarrelsome,

FIG. 27.—A Bark Raft.

unless their neighbours trespassed on their hunting-grounds. War is a civilized institution, based as a rule on the desire to obtain some other nation's property. Prehistoric man had little temptation in this way. Our tribe may have camped on the banks of the Wey for the summer. The river was a much bigger one than it is now, and one hopes they found the fishing good. In any case they would only have had the wooden spear to lance the fish with, and a flint boucher to cut it up afterwards. There would have been berries to eat, the roots of bracken and ferns, and nuts in the autumn, crab apples, wild cherries, and sloes. The bee had to give up his store to greedy hands that tore the comb, and crunched it up without waiting to run out the honey. There were snails and shell-fish, grubs and beetles, and luscious caterpillars.

Greatest joy of all a dead elephant, or hippo, or perhaps a rhinoceros, then would the tribe have sat down, and eaten their way through the carcase; if it happened to be a little bit high, we need not sniff, because we still like pheasant in the same condition.

But rough plenty would not last; hard times and winter would come on, and the tribe range far and wide in search of food. They would grow lean-ribbed as wolves, and just as savage. They would be driven by hunger to attack living game, and in the fight some would die that the others might live. The survivors at the meal would not have presented a pleasant spectacle; they would have torn the beast to pieces, and eaten it raw.

It must have been a hard life, yet the Call of the Wild still takes the big-game hunter to Africa, and the explorer to Polar Regions. The sick and ailing went to the wall, because little could be done for them. If a tooth ached, it continued to do so, until it stopped of its own accord. Chellean man did not practise dentistry. Notwithstanding all this, he was not a degraded savage, because this means a falling from high estate. He possessed the soul which makes man the restless individual that he still is. Just as the inventor of to-day has conquered the air, and seeks to harness all the powers of nature, so Chellean man experimented with his chipped flints, and found out the way to support life. There were doubtless good, bad, and indifferent men, as there are now; some who push the

world along, and others who retard its progress, but whether he hated, loved, hunted, or fought, our ancestor was fighting our battles as well as his own, and through all the thousands of years slowly struggling on an upward path.

Fig. 28.—Making Grass Rope.

Note.—In the limited space of this chapter, we have not been able to write much as to the actual manufacture of flint implements, or show the infinite variety of their shapes. At the British Museum, in the Prehistoric Room, in one of the table cases, there is a series of flints arranged to explain their manufacture, and in the cases of the Gallery over, a collection of magnificent specimens. If readers are interested, they should pay a visit to Bloomsbury, or the County Museums which have collections. A sight of the actual implements will make our pages more real.

FIG. 29.—Mousterian Cave-dwellers.

CHAPTER III

THE CAVE-DWELLERS

OUR next period is that of the Cave-dwellers, or Mousterians, so called after the cave of Le Moustier, in the valley of the Vézère, Dordogne (Fig. 29). Here again we are indebted to the French archæologists, who have examined the prehistoric remains so carefully that we have had to adopt their names. At Le Moustier the river has in course of time cut its way down through the limestone, which is left in cliff formation at the sides. In the cliffs, caverns were formed by surface water finding its way down from the top and wearing away pockets of softer stone, or by the river cutting out holes in the banks. This left the caves ready for the occupation of man, and, as the weather became colder, he looked about and found ready-made houses, a thing we should like to do to-day. When prehistoric man first inhabited these, they were just above the flood-level of the river; to-day they are often high up on the banks, because the river has continued to cut out its bed. All along the Vézère are caves, which are known all the world over by archæologists, and later on we shall hear of La Madeleine, La Micoque, Crô-Magnon, and others.

We will start by considering Mousterian man. In 1907 a skeleton was discovered in a cave on the banks of the Sourdoire, a tributary of the Dordogne, in the district of La Chapelle aux Saints. Let us at once point out that this is the first time we have found any evidence of people burying their dead in a place of sepulchre. The Piltdown man, and his cousin of Java, the man of Heidelberg, just dropped in their tracks, were brought down by the river currents, settled into the mud, and were covered up by

FIG. 30.—Neanderthaler or Mousterian.

gravel. In the case of the man of La Chapelle aux Saints, it is evident that he had been buried with care and perhaps love. Flint implements were laid ready to his hand for use in the hunting-grounds of the spirit world, and food for his sustenance. Think of the difference this means in the mental outlook of the relatives, and regard it as a notable step up the ladder of civilization. A similar discovery was also made at Le Moustier in 1908.

These discoveries were very important, because they enabled the archæologists to be quite sure of their facts in respect to other skeletons which had been found. In 1857 a specimen was discovered in a limestone cave at Neanderthal, near Düsseldorf, Germany; unfortunately, as in the case of the Piltdown man, the workmen who found it, not realising its value, broke up the skeleton. Remember the Java man was not discovered until 1891, and the Piltdown man in 1912, so the scientists were not

prepared for the Neanderthaler in '57. Some said the latter individual must have suffered from "something on the brain," to have had such an extraordinary shape to his head, but Huxley the great Englishman and others recognized the skull as human. From time to time various other skulls were found, until that of La Chapelle aux Saints confirmed the opinion that all belonged to one race, which is called the Neanderthal or Mousterian (*Homo Neanderthalensis*).

Our drawing (Fig. 30) shows what these men looked like, and has been made from the casts of the skulls of the Neanderthal and La Chapelle aux Saints men at the Natural History Museum. The most noticeable characteristic of the Mousterian skull is the one very *prominent* ridge going right across the brows. The frontal bones are very thick, and there is not much chin to the lower jaw. The head is large in proportion to the height, and the shin and thigh bones suggest that the man stood with knees bent forward a little (see Fig. 31). The arm, again, is longer than that of modern man. It should be noticed that the head is placed on the shoulders in quite a different way to ours. If any of our readers stand with bent knees, they will find that the head and shoulders swing forward. Mousterian man must have loped along, head to ground like a hunting animal, and would have found it difficult to look up (Fig. 32).

FIG. 31.—Poise of the Mousterian Figure.

Mousterian man was widely distributed, and though he seems to have been the first to use the cave, he did not entirely desert the camping-places of his ancestors on the river banks. He is supposed to have lived at the end of the Fourth Glacial period, so perhaps, as the weather gradually became warmer, he spent some of his summers on the Somme. Here M. Commont has identified his implements in the Ergeron, or younger Loess, which, as we

FIG. 32.—Mousterians on the March.

have seen (p. 14), was deposited by wind on the terraces.

The boucher disappeared soon after the beginning of the Mousterian period; this in Acheulean times was made by knocking flakes off a nodule of flint. The flakes were used for making small scrapers and the like. Mousterian man appears to have dressed one side of his implement first on the nodule, and then to have detached it as a large flake. This, again, is an interesting fact, and shows that man was beginning to economize in the use of material. The weather too was becoming colder, and the hills would have been covered with snow. Flint is only found in chalk of the cretaceous beds. In many parts of the country it has all been cut away by the action of water, and the flints taken with it to form gravel in the river terraces lower down. Flint suitable for making implements must have been valuable to prehistoric man, and a stray flint from the surface is not so good for flaking as one quarried out of chalk. So for some it meant a long journey, and encounters with woolly rhinoceros *en route*, to obtain the raw material for his industry, then perhaps the bartering of skins in exchange for the flints, and a toilsome carrying home of the heavy stones. Perhaps it occurred to Mousterian man that if instead of wasting a whole large flint to make one boucher, he used the flakes, he could make several implements out of one nodule. This is what he did, and it marks one more step up the ladder.

Fig. 33.—Mousterian Spear-head.

We call these Levallois flakes. Sharp-pointed flints are also found notched on one side, evidently for use as lance-heads (Fig. 33).

Spherical balls of limestone have been found, and it is thought that these may have been used as bolas. Darwin describes the bolas used by the Gauchos of Monte Video, South America. "The bolas, or balls, are of two kinds.

The simplest, which is chiefly used for catching ostriches, consists of two round stones covered with leather, and united by a thin plaited thong about 8 feet long; the other kind differs only in having three balls united by thongs to a common centre. The Gaucho holds the smallest of the three in his hand, and whirls the other two round and round his head ; then, taking aim, sends them like chain shot revolving through the air. The balls no sooner strike any object than, winding round it, they cross each other and become firmly hitched." The Gaucho lives on horseback, but the Eskimo goes on foot, and he uses a bolas with seven or eight cords, and attached stones, and this he uses to bring down birds on the wing. The stones are formed by being knocked together till they become round.

The Reindeer and Musk Ox were newcomers from the north in Mousterian times, and were hunted by prehistoric man for his food ; but we do not find anything that would lead us to suppose that he had as yet domesticated animals.

There is one very black mark against the Mousterians, and that is evidence, which is supposed to point to cannibalism, contained in deposits in the Rock Shelter of Krapina, in Croatia. Here were found human bones which had been broken, as if to extract the marrow, and burnt by fire. We shall find on p. 61 that the Australian aborigines, while not being habitual cannibals, yet practised this dreadful art, as a ceremonial way of disposing of the dead bodies of their relatives.

It will be seen from the foregoing that, though we know a little more about the Mousterians than about Chellean and Acheulean man, it does not amount to very much. We must then search for some primitive people living under similar conditions, and at about the same stage of civilization as the Mousterians, and see if we can draw useful comparisons. The aborigines of Australia are such a people. Of them Messrs. Spencer and Gillen have written that they " have no idea of permanent abodes, no clothing, no knowledge of any implements save those fashioned out of wood, bone, and stone, no idea whatever of the cultivation of crops, or of the laying in of a supply of food to tide over hard times, no word for any number beyond three,

FIG. 34.—Australian Spear-throwing.

and no belief in anything like a supreme being." They have not been treated quite so brutally as the Tasmanians were, and are still allowed to exist on sufferance, and end their days as a race on the unfertile lands. In the beginning, it seems as if they followed the Tasmanians into Australia from the mainland, and settled there, driving some of the latter people into Tasmania and mixing with them to some extent.

The scientists divide mankind into three groups: the Cymotrichi, with wavy hair like ourselves, and the Australians come into this group; the Lissotrichi, whose hair is perfectly straight, like that of the Eskimo; the Ulotrichi, whose hair is very twisted, as in the case of the Negroes, Bushmen, and Tasmanians. Their spear shows a considerable development on that of the Tasmanians, and resembles the Mousterian type. About 10 feet long, some have hardwood points on to which barbs were spliced. Others a flint point, as Fig. 33. The Australians use a spear-thrower. This has many forms, but the essential feature is a stick about a yard long, with a handle at one end, and a peg at the other. Figs. 34 and 35 show the spear-thrower in use. First the end of the spear is fitted on to the peg of the thrower. This is held in the right hand well behind the

body, the left hand balancing the spear. It is then thrown up and forward, the thrower imparting an additional impulse as the spear leaves the hand. Darwin when in Australia saw the natives at practice. He wrote: "A cap being fixed at thirty yards distance, they transfixed it with a spear, delivered by the throwing-stick with the rapidity of an arrow from the bow of a practised archer."

This short range means that the Australian must be an expert hunter and tracker, if he is to approach within striking distance of his quarry, the kangaroo. Mousterian spear-throwers have not been discovered in Europe as yet, but we can safely assume that the shorter type, as Fig. 67, which is a harpoon-thrower, was not arrived at without many simpler forms going before. The Australian uses a wooden shield, which is a development on the Tasmanian equipment. Very much narrower than those of mediæval times, it is a long oval in shape, varying from 2 feet to 2 feet 6 inches in length, by 6 to 12 inches in width. Rounded on the outside, the inside of the shield is hollowed out so as to leave a vertical handle. When one thinks that this is all cut out of the solid with a flint, it becomes a notable piece of work. The shield points to quarrels and fighting, because its only purpose can be to protect the user against spear thrusts. We do not know if the Mousterian used shields.

Before we forget it, let us say that our readers should pay a visit to the Ethnographical Gallery at the British Museum, and see there a spear-head made by the Australians, in recent times, from broken bottle glass ; it is an astonishing production, and the man who made it a great craftsman. A visit should be paid to the British Room where there are Mousterian types, and so comparisons can be drawn.

The Australians make very useful knives out of long dagger-shaped flakes of stone, and by daubing resin at one end form rounded handles. They mount sharp flakes in the ends of sticks with resin, and these are used as chisels and adzes. There are stone picks inserted like the spear-heads in cleft sticks, only at right angles ; these were secured with tendons and resin. Stone axes are made, and these are hafted in a withy handle, made supple by heat, and then bent around the axe, and fastened with

FIG. 35.—Australian Spear-throwing.

tendons and resin. This suggests that the flaked stone found by Mr. Falkner at Churt, near Farnham, Surrey (Fig. 36), may have been mounted in much the same way.

The Australian implements should be seen at the British Museum. Some of their work is ground and polished, and here in Europe we associate this with the next period, the Neolithic. Their methods of hafting are of great interest, and prehistoric people must also have used some such way to protect their hands from the razor-like edges of the flints. Like the Tasmanians, the Australians walk abroad without any clothes, but wear skin cloaks in their huts; they stitch these together with sinew, and use bone awls and pins for piercing the skins. Necklaces and forehead bands of shells and teeth are worn, and they make themselves beautiful by pushing a short stick, called a nose-pin, through the thin membrane which divides the nostrils. Their bodies are anointed with grease and red ochre. They also sacrifice joints of their little fingers, as we shall find the Aurignacians did in Europe. Their huts are very simple, and serve for the camp of a day or so, which makes a break in their wanderings. Fig. 37 shows such a type, which may have been used by Mousterian

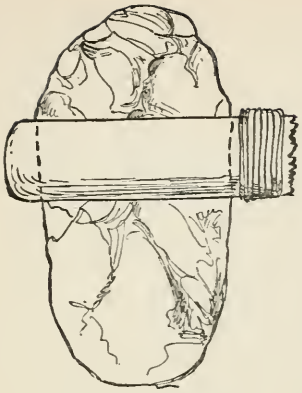

FIG. 36.—Hafting.

man in the summer when he left his cave. It represents the next development that we should expect from the Tasmanian's break-wind (Fig. 22). It is, in fact, like two break-winds leaning together, and was made of any rough branches that came to hand.

The Australians have another method of lighting fires by friction: one stick is held in the hands and rotated in a hole in another, until the wood dust is ignited (Fig. 38). Darwin gives an improvement on this method: "the Gaucho in the Pampas . . . taking an elastic stick about 18 inches long, presses one end on his breast, and the other pointed end into a hole in a piece of wood, then rapidly turns the curved part like a carpenter's centre-bit."

Another interesting development is the bark canoe of the Australians, as Fig. 39. The lines of this are much the same as that of the Tasmanians (Fig. 27), but the construction is that of a real boat, not a raft. A long strip of bark is stripped from the gum tree with a stone axe and warmed over a fire to make it supple. Curved saplings, bent as ribs, give the shape, and a stretcher goes across the tops of these, and the boat is prevented from spreading by grass rope ties from side to side. The prow and stern are tied up with stringy bark. A small fire is carried on a clay floor. The Australians are great fishermen, and have invented a barbed harpoon, and fish-hooks of shell and wood.

The point of the comparison is that in Europe, after Mousterian times, we come across well-made harpoons, which could only have been used for fishing. These could not have developed without long experiment. Mousterian man may have gone fishing with a spear without barbs, and from his poor catches may have thought out the more effective harpoon. Therefore they must have used some

FIG. 37.—Australian Hut.

FIG. 38.—Making Fire.

form of canoe, which, of course, has long since disappeared, so we turn to another primitive people for inspiration. The Australians make another form of canoe where bark is sewn on to the framework. The coracle of Wales and Ireland, the kayak and umiak of the Eskimo, were of this form, only skins were used instead of bark, and this may have been the Mousterian method. We do know that in Europe in Neolithic times the dug-out canoe was employed.

The Australians carry on trade by barter. The red ochre they need for decorating their bodies, may be exchanged for stone suitable for making implements. They have not any form of writing, but send news about by message sticks. There is one in the British Museum from North Queensland. It resembles a short wooden lath about 3 inches long, with zigzag cuts and notches. The meaning of the message is "that the dogs are being properly cared for, and that the writer wants clothes." The lady would not have worn more than a skin cloak, with perhaps a hair fringe round her waist, and a necklace of shells, so that her dress allowance would not have needed to have been a very large one. We do not hear the husband's reply, but expect it was that he was short of the equivalent of cash. The Australians are excellent hunters, as were the Tasmanians. Kangaroos are eaten, also almost all the other animals and birds, grubs and the pupæ of ants, fish and shell-fish. Their cooking is very much like that of the Tasmanians (p. 42), the animals being first gutted are cooked in a pit. All tendons are removed for use.

Another notable development is that the women collect the seeds of various grasses and plants, and grind these down between stones and winnow by pouring from one *pitchi* into another, so that the husks are blown away.

They make rough cakes of the resulting flour. The *pitchi* is a shallow wooden trough used for shovel or scoop as well. The Mousterians may have collected seeds in the same way, and so have started the long chain which led up to the household loaf of to-day. The Australian women use a yam or digging-stick, like the one illustrated (Fig. 62), but not loaded with a stone to increase weight. The yam-stick is not used to cultivate the soil, but for digging up honey ants or lizards which are eaten. Remember we have seen that Darwin found people living exclusively on meat, and that this was general before the advent of agriculture; but this collecting of seeds would naturally have suggested the idea of growing plants for food.

The Australians did not practise cannibalism, except in a ceremonial way, when, as is the case in Victoria, they regarded it as a reverent method of disposing of dead relatives.

We have seen (p. 43) that the Tasmanians made rush baskets, and grass rope for climbing trees and tying up their rafts. With the rope they would have learned the principle of twisting together short lengths of fibre, so that these made a continuous string. This is the principle of all spinning. The wool with which the stockings of our readers are darned is in reality a number of short hairs kept in shape by the twist of the spindle of the spinning machine. Fray out an inch of wool and see. The Arunta tribes in Central Australia can manufacture twine of fur or human hair. For this they use a spindle as A (shown in Fig. 40): this is a stick about 14 inches long, which at the spinning end is pushed through holes in two thin curved sticks, about 6 inches long, placed at right angles to one another. Some fur or hair is pulled out, and part of it twisted with the finger into a thread long enough to be tied on to the end of the spindle; this is rotated by being rubbed up or down the thigh. The remainder of the fur held in the hand is allowed to be drawn out as the spindle twists the thread; this is then wound up on to the spindle, and more of the fur paid out, and more thread twisted. This, we think, is the greatest achievement of the Australians, and they, as we have seen, are to all intents and purposes living in a Stone Age. The problem is, for how long they have used the spindle;

did they bring it with them in remote ages from the mainland; did prehistoric man, whom the Australians so closely resemble, use a spindle? They must have needed rope, and if they made it in this way, then the sixteenth-century spinning-wheel, and the eighteenth-century spinning-jenny, would have their roots very deep in the past, because both are only mechanically driven spindles which trace their descent from something like Fig. 40. The Australian does not use his twine for weaving, but contents himself with making net bags. Fig. 28 shows a still more primitive method of making twine out of long shreds of bark.

The Australians have a very complicated system of relationship. A group will be divided into two classes or phratries: one-half may be Crows, the other Lizards. A Crow would marry a Lizard, not another Crow; would be kind to all the other Crows, and regard the birds of that name as feathered friends. This was a means not only of binding men together in fellowship and friendship, but it preserved the decencies, and prevented the marriage of persons too closely related for it to be seemly. Each group had various ceremonies, generally concerned with invoking the totem animal to promote plenty. In Aurignacian times in Europe, it is suggested that the cave paintings may have had totemic significance. Totemism is very widely spread, and gives us a new respect for primitive peoples; it shows them shaping their lives to a system, and not just chattering their way along like so many monkeys.

The Australians have not any other settled form of government, but each group or tribe has a headman, who by reason of skill in hunting or special gifts takes the lead. They are not a quarrelsome people. War is a terrible luxury in which primitive man cannot afford to indulge. His quarrels were mere skirmishes as to boundaries of hunting-grounds; it never occurs to the Australian to steal his neighbour's territory. In his opinion this is inhabited by the spirits of their ancestors, and so would be a useless possession to him.

The Australians very frequently associate death not with natural causes, but with magic wrought by an enemy. This leads to trouble, because if the medicine

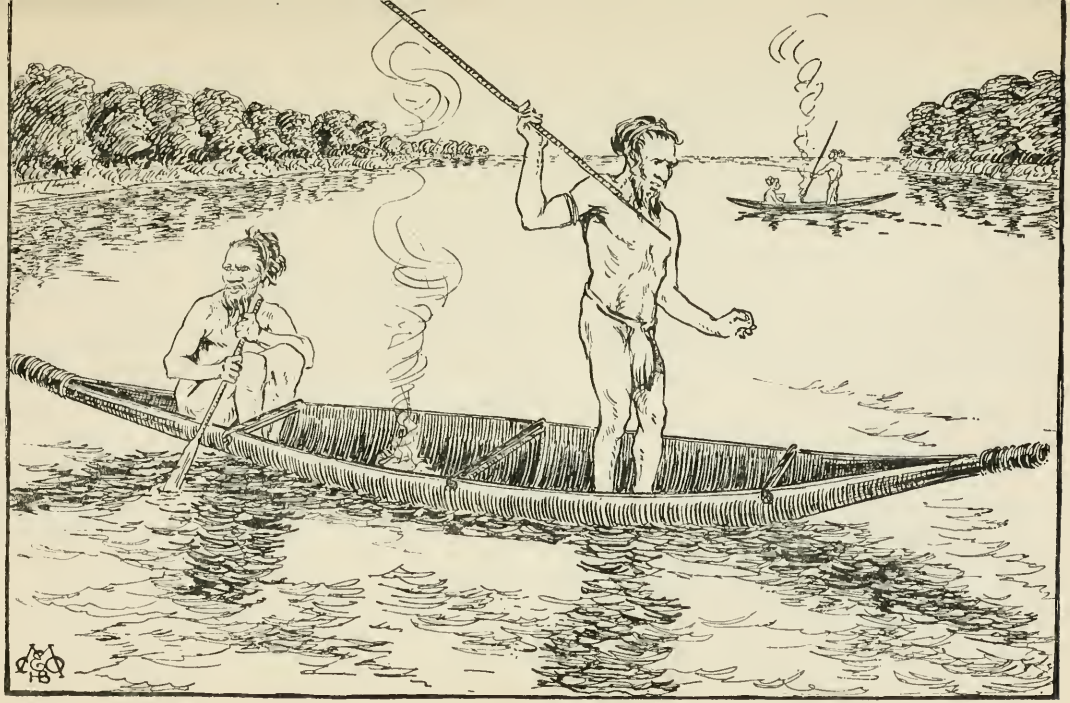

FIG. 39.—A Bark Canoe.

man of the tribe names the enemy, and the enemy is a neighbour, he is tracked down and put to death. In this way the unfortunate native helps to bring about his own extinction. This fear of magic has always been strong in the minds of primitive people.

Games of all sorts are played by the children, who practise throwing spears, and also an amusing little implement called the "weet-weet," because it has the form of a kangaroo rat. Then a day comes when the boys are grown up, and are initiated and become men. Dances are performed by the men before the novitiates to typify essential qualities. The dog and kangaroo are shown for endurance and speed. The boy has one of his front teeth knocked out to teach him to bear pain. The bull roarer, a long flat leaf-shaped piece of wood scored across, is whirled round on a thong, and the whistling noise it makes is thought to be the voice of a god. It is the boy's introduction to the spiritual life of the tribe ; to a knowledge of the Mysteries, and of the High God who lives in the Sky.

When an Australian is born it is assumed that he brings with him a *churinga* ; these are long flat pieces of wood or stone with rounded ends, marked with various totem devices, and considered sacred objects. These are deposited in caves, and only brought out for ceremonies.

The Australians have various methods of disposing of their dead, but burial is the most general. With the bodies are interred weapons, food, and a drinking-cup for use in the happy hunting-grounds, so that in one more detail they resemble the Mousterian man of La Chapelle aux Saints, with whose remains a flint boucher was found.

We need not continue these comparisons, but we hope that those we have given may help to build up a picture of what the surroundings of Mousterian man may have been like.

At the end of the second chapter we gave a sketch of Chellean man, and tried to show that his most urgent need was food ; that unless he hunted, he starved, and could not depend, as we do, on a shop round the corner, and the effort of other men. This was the material side of his life ; but what of the spiritual ? We shall be quite wrong if we think of primitive man as being only concerned with

food, because man has always demanded some other interest.

We have the very early belief in a life hereafter, in the happy hunting-grounds, where conditions were kindlier, and there was more opportunity to expand. The Chapelle aux Saints burial, with flint implements to hand, for use in the spirit world, points to this. How did this come about? Primitive man, or woman, curled round asleep by his fire, dreamed dreams and saw visions; his spirit seemed to separate from his body, and he joined old friends who were dead, and with them followed in the chase, or did the wonderful things we all do in our dreams. When he awakened and rubbed sleepy eyes to find his own fireside, he told his friends of his adventures; that so and so was not dead, but a spirit in a wonderful world. We can see the beginnings of ancestor worship. An acute fit of indigestion, coming after too much mammoth, would have provided the nightmare, and its equivalent horrors, and an underworld of bad spirits.

FIG. 40.—A Primitive Spindle.

The man of imagination would have polished up the tale, and filled in the gaps, and gaining much renown thereby, became the medicine man or priest. He would exorcise the evil spirits, for a consideration, or bring messages from the good ones. At other times, in the excitement of hunting, the voice of the man would be echoed back from the hills, where by search he could find no other people. It was magical and mysterious, just as it was

when his own face looked back at him from the pool to which he stooped to drink.

The sun, moon, and stars gave him cause for wonder, and glaciers mightier than the Baltoro seemed to him alive, as they crept to the sea. He made them gods. Perhaps on a stormy day he looked through a rift in the clouds, and saw others heaped and peaked into glittering pinnacles lighted by a sun he could not see himself, and thought of it all as the pleasant country of the land of dreams. The long nights and storms made him fearful.

We can never know very much about the poor Mousterian, because, most sadly to relate, at the end of the Fourth Glacial period he became extinct in Europe. He had done as much as was possible for him. His large head, with the thick frontal bones, must have been very good for butting a brother Neanderthaler, but it was no use against the stone wall of advancing civilization, and like the Tasmanian and Bushman, the Red Indian and Australian of nowadays, he fades out of the picture, and his place is taken by a cleverer people.

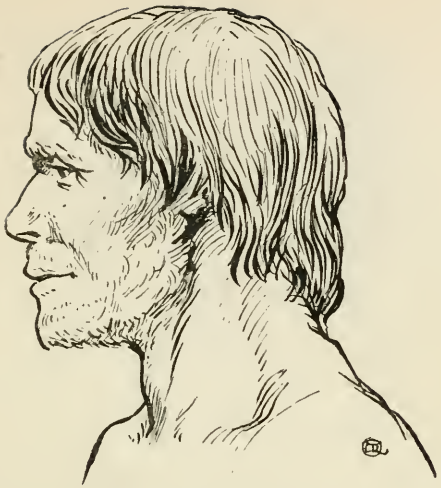

FIG. 41.—The Crô-Magnon Man.

CHAPTER IV

ARTISTS OF THE OLD STONE AGE

AURIGNACIAN MAN

WITH Mousterian man the Lower Palæolithic period of the Old Stone Age came to an end, and the next phase we shall consider will be the Upper Palæolithic. At the base of this we find the Aurignacian or Loess men, and of these there are at least three types. Fig. 41 shows the Crô-Magnon, and is a sufficient explanation why the poor old Neanderthaler or Mousterian went to the wall.

The Crô-Magnon man gains his name because his remains were found in a rock shelter of that name in the valley of the Vézère ; the same river which has the cave of Le Moustier on its banks (p. 49). The bodies had evidently

FIG. 42.—Combe Capelle Man.

been buried with reverence and were probably clothed. Flint implements for use in the spirit world were found with the skeletons. The Crô-Magnon people were a fine race, with an average height of 6 feet. The skulls are dolichocephalic (p. 24), cephalic index 73·41, well shaped with a capacity of 1590 to 1715 cubic centimetres, quite up to the average to-day. The faces were broad and the chin well developed. Man's jaw was the last thing to be civilized. Our drawing (Fig. 41) has been made from the plaster casts at the British Museum, and shows a type which can be recognized as modern man (*Homo sapiens*).

The second type (Fig. 42) was discovered in 1909 at Combe Capelle, on the Couze, a tributary of the Dordogne. The body when buried had been provided with flint implements, and perforated shells were found which had probably been used to decorate the clothing. The skull is very long and narrow, and the skeleton that of a man of short stature, in contrast to the Crô-Magnon, who was tall.

An Aurignacian skeleton has been found in this country at Paviland, in South Wales.

At the same time there appears to have been a third type, the Grimaldi, in Europe during Aurignacian times (Fig. 43). Skeletons have been found at the Grotte des

FIG. 43.—Grimaldi Man.

Enfants at Mentone, which show marked differences to the Crô-Magnon man. The skulls are dolichocephalic, but the mouth projected in a prognathous manner, with the chin retreating under. The nose was flat and of negroid character; the people not more than 5 feet to 5 feet 6 inches in height. Prof. Sollas, in his book *Ancient Hunters*, reviews the evidence which points to these people as the ancestors of the Bushmen of South Africa; they may, in fact, have first come from Africa, and then have been forced back by the cleverer Crô-Magnons. The Aurignacians were cave-dwellers but lived as well in the open; their camps have been found in the newer Loess (p. 14), and for this reason they have been called the Loess Men. If, as has been thought, the Bushmen may be the descendants of the Aurignacians, we may perhaps assume that the Loess men had the same sort of huts. These the Bushmen constructed, much as the gipsy does to-day, with a frame-work of bent sticks covered with skins (Fig. 44). Darwin wrote of the "toldos" of the Indians near Bahia Blanca, South America, "these are round like ovens, and covered with hides; by the mouth of each a tapering chuzo (spear) was stuck in the ground."

FIG. 44.—Type of Huts suggested by Aurignacian drawings.

Fig. 45.—The Spokeshave.

The Aurignacian people improved on the Mousterian flint implements; we find several sorts of scrapers, knives, and gravers; the latter a tool for engraving of which they made very clever use. There are scrapers flaked ingeniously into very useful spokeshaves, and Fig. 45 shows a man shaving down the shaft for a lance. The Aurignacian man, judged by the variety of tools which he possessed, must have been a clever workman making all sorts of things; remember all his woodwork has disappeared, and we only find now the imperishable flint, and some bone implements. With his burin, or graving tool he easily cut pieces out of reindeer horns, and made arrow and spear heads. This use of bone marks another step forward, and from now on we shall find many examples of this new material. Bone bodkins were used to pierce skins and pass sinews through, then the bodkin had a blunt barb formed at one end to pull the thong through

FIG. 46.—Shaft-straightening.

like a crochet-needle, and so led up to the bone needles of Upper Solutrean times later on (Fig. 52). Later on we shall find barbed harpoons. The Aurignacian used the bow and arrow—we know this because shaft-straighteners have been found, bored to take shafts of different thicknesses. These were used as shown in Fig. 46. The shaft, after having been shaved clean, would have been passed over a wood fire to make it supple, and then slipped through the hole of the shaft-straightener, which is cut obliquely. It can be seen that pressure applied on the handle would bend the shaft in any desired direction. The natives of the Punjab in India still straighten bamboos in this way, only their shaft-straightener is a substantial post set strongly in the ground. Through this there are bored holes, and the warmed bamboo is put through these, and curves removed by bending the stem in an opposite direction. The Eskimo, on the other hand, follows the Aurignacian way. The early bow, like the early gun, was probably not very effective, and the spear must have remained the great weapon. Darwin, writing of the Indians from the south of Chile, said: "The only weapon of an Indian is a very long bamboo or chuzo, ornamented with ostrich feathers, and pointed by a sharp spear-head."

The boring of holes in the shaft-straightener, and the use of the bow, suggests that the Aurignacians used the bow-drill both to bore holes and make fire, as the Eskimos do (Fig. 47).

FIG. 47.—The Bow-drill.

The Aurignacians hunted as the Mousterians had done for their food, and people had not yet learned how to domesticate animals, or grow foodstuffs. The reindeer were very plentiful; so much is this the case that the French archæologists talk of the Upper Palæolithic as the Age of the Reindeer. The climate was improving, and as the Fourth Glacial period receded, game became more plentiful. The horse was eaten in those days, and in France huge mounds of the bones have been discovered, left as the débris of many Aurignacian feasts. Even so late as 1831 Darwin wrote of South American troops: "Mare's flesh is the only food which the soldiers have when on an expedition."

Here is an account of how the horses may have been caught, taken from Falconer's *Patagonia*: "The Indians drive troops of wild horses into a 'Corral' encompassed by high cliffs between 30 and 40 feet high, excepting at one spot where the entrance lies. This is guarded to keep them secure."

In our part of the country, at Ivinghoe Beacon, is a curious cleft in the hills, which tradition says was a wolf trap in olden days, and its form certainly lends to it the appearance of a corral. There appears to have been plenty of food in Aurignacian times. Fig. 48 has been drawn from the skeleton of the Irish Deer (*Cervus giganteus*)

in the Natural History Museum This splendid animal was found in Europe during Pleistocene times.

There is another fact which goes to show that the conditions of life were becoming easier. Man and perhaps woman began to draw, and to do so extremely well. This is a most interesting fact, and one which should be noted, that the tribe was content to let these people spend their time in this way. One can imagine that the Mousterian or Neanderthaler, very much occupied with the struggle for existence at the end of the Fourth Glacial period, would have dealt sternly with the budding artist, who desired to cut his share of the "chores," because he wanted to draw; but in Aurignacian times he was allowed to do so, and drawing and sculpture extended into the Magdalenian period. These drawings and paintings are something altogether beyond the art of ordinary savage people. The Australians, for instance, decorate their wooden shields with red, white, and black, wavy lines, and lozenges, which have a pleasantly decorative effect; but of the polychrome figures which marked the culmination of Magdalenian art, the Abbé Breuil has written: "et qui place les vieux peintres des âges glyptiques bien au-dessus des animaliers de toutes les civilizations de l'orient classique et de la Grèce." So here is another problem; it is quite certain that endless experiment must have been made before the artists could have arrived at such marvellous dexterity. How did these wonderful people jump out of the void of time? These drawings were first discovered by a Spanish nobleman, Marcellino de Santuola, who lived at Santander, Spain. He was interested in archæology, and was digging one day in the cave of Altamira, near his home. With him was his little daughter, who tired of watching the digging, wandered round the cave, and alarmed her father by calling out "Toros! Toros!" Bulls in a cave would be somewhat alarming, and M. Santuola, hurrying to the rescue, found the small girl gazing at the roof of the cavern. Here he discovered drawings and paintings of bulls, bison, deer, horses, and many other animals, some life size. The discovery threw the archæological world into commotion—most discoveries do; people could not believe that these really wonderful drawings could have been produced at such an early stage in the world's history.

FIG. 48.—*Cervus giganteus*, the Irish Deer.

Just as the Neanderthaler was not at first believed to be a man, and the Eoliths are not yet generally recognized as the work of man, so the Altamira drawings were received with scepticism. That stage has been passed through now, many books have been written, innumerable papers read before learned societies, and other drawings discovered in certain French caves, which have convinced the archæologists that in the Altamira cave are authentic works of the earliest period of the world's art ; and we owe the discovery to one small girl who called "Toros!" in alarm to her father.

The old painters seem to have started with drawings in outline like Fig. 49, and then later in Magdalenian times they passed on to colour (as Fig. 1), and some of these have an engraved outline. If our readers are interested, they should try and see a book by the Abbé Breuil, a distinguished Frenchman who has made a special study of this work.

We must pass on to a consideration of what purpose

the drawings served. At Altamira they are in a dark cave, which has a total length of 280 metres ; and a metre is about 3 feet 3⅜ inches. There is no light in the cave, and the figures occur over all the walls. They cannot be seen now without a light, and a lamp must have been used when they were painted ; so we have another discovery, that man had artificial illumination in Aurignacian times. A dark cave, though, does not make a good picture gallery for display, and it does not seem as if the Cave were the National Gallery of the day.

Many suggestions have been made as to the uses of the paintings ; one is that as most of the animals drawn are those which were hunted for food, the paintings formed a magic which placed the animals under the power of the medicine man of the tribe. Many of the animals are drawn with arrows sticking in their bodies ; on some the heart is shown in red. This was a practice which lingered on till recent times—to make a model of your enemy and stick it full of pins ; that is, if you were a spiteful person and wished him harm.

The Aurignacians were accomplished sculptors and modelled quite good little figures in the round about 4 to 5 inches high, and as well in low relief. A curious detail is that the faces are not rendered ; in their drawings and paintings, they seldom if ever presented the human figure, except occasionally by grotesque faces. This may have arisen from the fact that primitive people think that a picture or figure of a man becomes part of his personality. If damage be done to it, then it reacts on the man, so any recognizable portrait of an individual doubles his risks. In the case of the animals drawn this was desirable to the Aurignacian.

Another suggestion is that the mammoth, the bison, or any of the animals drawn, might have been the Totem of the tribe ; that they were grouped in clans, as the brothers of the bison perhaps. This, as we have seen, was a practice with the Australians, the Red Indians of America, and the boy scouts of to-day. The Altamira cave in this case would have been the temple in which were preserved totem symbols. One peculiarity at Altamira is that one drawing is frequently found made on the top of another. The interiors of the loftier caves must have first turned

FIG. 49.—Aurignacian Drawing.

men's ideas in the direction of fine building ; something which should be nobler than their little huts, and suitable for ceremonies. Imagine prehistoric man first finding his way into a cave, from the lofty roof of which hung down stalactites, like pendants to the fan vaulting of Henry the Seventh's Chapel at Westminster. The stalagmites like rising columns, and all the glittering points would have thrown back the light of his lamp. The cave originated the idea of building which we shall see later as Picts' houses, and at first must have been used as the tribal temples. In the painted caves of France and Spain are found the imprints of hands. A hand has evidently been smeared with colour, and then printed on to the surface of the rock or the hand placed there first, and then colour dusted over it, leaving a white silhouette when the hand was removed. Many of the hands show traces of mutilation ; that is, the end of a finger has been cut off at the joint. This dismal practice was widely spread and lasted until recent times. It was a form of sacrifice. It existed among the Australians, the Bushmen of South Africa, and some of the Red Indians, for example, and was practised for a variety of causes, generally as a sign of grief, and to implore the better favour of the gods in future. It seems reasonable, then, to suppose that the Aurignacian people lost the fingers, which must have been so useful to them, in some such way.

The Aurignacian women, and perhaps the men as well, appear to have been fond of trying to make themselves beautiful. Here in Great Britain, at Paviland Cave in Wales, were found perforated wolves' teeth for use as a necklace, and an ivory bracelet made by sawing rings through the hollow base of a mammoth's tusk. Fig. 50 shows a wolf's tooth from Ivinghoe Beacon. We can also be quite sure that so gifted a people as the Aurignacians must have experimented in the production of music. We know that they had bows and arrows. The twang of the bow led to our piano. The latter is only a harp on its side, the strings of which are struck with hammers instead of plucked with the fingers, and the harp is the bow with many strings ; the reed and pipe would lead to the horn, and the drum has always been the great instrument of the native musician. At Alpera, in Spain, are

some wonderful paintings of late Palæolithic date, and here are shown figures of women who seem to be dancing. Now dancing means some sort of music, and the cheerful tum-tum of a drum is almost necessary if one is to keep time. In the original Alpera drawings are figures which appear to be wearing quaint head-dresses; perhaps this was a masquerade. If all this sounds improbable, remember their wonderful drawings; to such people much is possible. Dancing has always been an accomplishment of savage people. Darwin wrote of a "corrobery," or dancing party, of the aborigines in Australia, held at night by the light of fires, the women and children squatting round as spectators. An "Emu dance, in which each man extended his arm in a bent manner, like the neck of that bird. In another dance, one man imitated the movements of a kangaroo grazing in the woods, whilst a second crawled up, and pretended to spear him." In this way they dramatized their everyday life.

FIG. 50. — Perforated Wolf's Fang, from Ivinghoe Beacon.

SOLUTREAN MAN

The next division of the Upper Palæolithic is the one which the archæologists have named the Solutrean, after Solutré, near Maçon (Saône-et-Loire) in France. Solutrean man appears to have lived in England, because evidences of his industry have been found at Paviland Cave in South Wales, and Cresswell Crags, Derbyshire; as well as in France, Central Europe, and the North of Spain, but not in Italy. The Solutreans may have been horse hunters who invaded Europe along the open grasslands of the Loess (p. 14). It has been assumed that they were a warlike race, because of the very beautiful flint lance-heads which have been found; some of these are like an assegai, and would have been deadly weapons (Fig. 51). They are beautifully flaked flints, shaped like a laurel leaf, from which they get their name (*pointe en feuille de laurier*); the smaller types

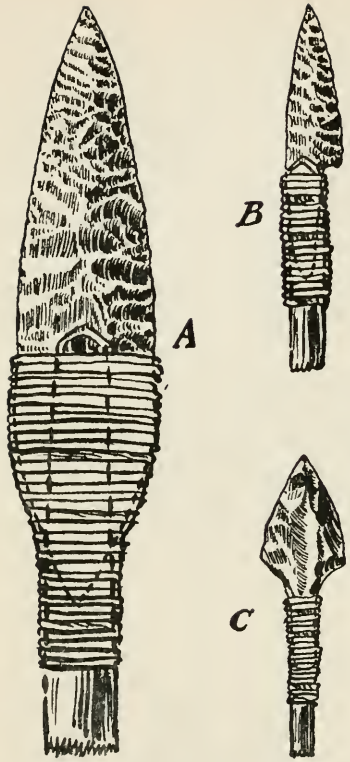

FIG. 51.—Solutrean Flints.

like a willow leaf, and so called (*pointe en feuille de saule*). B shows the highest Palæolithic development of flint flaking, the *pointe à cran*, or shouldered point, by which a primitive barb was formed. C is an arrow-head with a flint tang which could be bound on to the shaft.

Flint flaking came to its highest point of development in the Old Stone Age in Solutrean times, though it was to revive again later in the New Stone, or Neolithic Age. The Solutreans made borers, scrapers, and arrow-heads; they, in fact, carried on the traditions of the Aurignacians; bone and ivory were used; and painting and drawing continued. Perhaps the most wonderful development of this time was the bone needle; at the beginning the sewing had been done in the same way that a shoemaker sews the sole of a shoe now, by boring a hole with a bone awl, and then passing a thread through. Of course, the Aurignacians had not any thread, but must have used fine sinews in this way. The next step was to hook the end of the awl so that the sinew could be pulled through, using the awl first to pierce the hole, and then as a crochet-needle to pull the thread through. The final step was to combine the two operations into one by the use of the needle, which pierced the hole, and carried the thread through

Fig. 52.—Making of Bone Needles.

itself (see A, B, and C, Fig. 52). To realize the joy of a Solutrean woman who first used a needle, let us imagine ourselves sewing to-day like a shoemaker, punching holes one at a time.

Fig. 52 shows a Solutrean needlemaker at work; first she cut a splinter of bone out of reindeer horn, as at 1. This was done by cutting a groove on each side with a flint graving tool, as at 2. The splinter was then shaved down with a scraper, as 3, and polished with a piece of stone, as 4, and the eye bored with a flint borer, as 5. You

can see, at the British Museum, the actual needles and the implements with which they were made, and it is worth a visit to see these. A sewing machine is a mechanically operated needle. At the British Museum you can see the start of the whole long business which led up to the sewing machine. Magdalenian women later on used hollow bones as needle-cases.

Though the Fourth Glacial period was now long past and the weather was gradually becoming more temperate, it did not improve in a regular way. The weather was colder than in Aurignacian times, and the mammoth and reindeer were still found in Europe.

Magdalenian Man

We can now pass on to the Magdalenian men, who succeeded the Solutreans. The typical station of the industry is on the Vézère, not far from the Castle of La Madeleine, hence the name. The Solutrean excelled in flint flaking, and the tool and the implement he made of it were both in this material. The Magdalenian used flint for his scrapers, borers, and gravers and finished them roughly. For the implements he made, he preferred bone and ivory. This detail at first may not seem of much importance, in reality it is as vital as if to-day we gave up steel and concrete and started using some new material. Flint was to have a wonderful renaissance in Neolithic times, later on, before it slowly gave way to bronze. In many ways the Magdalenians appear to have been the descendants of the Aurignacians.

Magdalenian man appears to have been widely distributed over Europe. At Altamira, in Spain, he added the masterpieces of painting to the earlier drawings of the Aurignacians. He lived in France, Germany, and Belgium, and here in England his handiwork has been found at Kent's Hole in Devon, and Cresswell Crags in Derbyshire. We are so anchored nowadays, with our houses to live in, and farms to raise foodstuffs, that it is difficult to realize this widespread distribution of prehistoric man, but in reality he needed far larger areas of land on which to hunt and find food. Prof. Sollas has an extremely interesting

FIG. 53.—Chancelade Man.

chapter in his book *Ancient Hunters*, in which he sums up the evidence of what Magdalenian man was like. So far as can be judged there were two types, the tall Crô-Magnons, and a shorter race like the Eskimo of to-day. A skeleton of the former was found again in the Vézère at Laugerie-Basse, Dordogne in France, which had been buried in a contracted position with knees drawn up. Cowrie shells were found with the bones, and it is thought must have been sewn on to the clothing of the body, which was probably fully clothed when buried.

In 1888 another skeleton was found on the banks of the Beauronne, near Perigueux, Chancelade. It was of a shorter man than the Crô-Magnon, in many ways like the Combe Capelle type, the skull large and like those of the Eskimo to-day, with a ridge along the top. The head dolichocephalic and extraordinarily high (p. 24). Fig. 53 gives some idea of the appearance of the Chancelade

man. It has been suggested that he was the ancestor of the Eskimo, and was gradually pushed out of the fertile regions by the new race of men who came in Neolithic times, later on.

The climate was improving, and the Ice Age receding as a distant memory. The reindeer and mammoth were going north, and the Chancelade men, as hunters perhaps, followed their tracks, and so left the way open for the herdsmen and farmers who were to follow.

Magdalenian man made his spear and arrow heads in ivory and reindeer horn ; these were spliced on to wooden shafts and consisted of long lance-like points (as 1, Fig. 54). From these developed harpoons, first with one row of barbs, and then with two, as 2 and 3. This was a most useful discovery, that the barb would hold a fish after it had been speared ; one can imagine the disgust of the early fisherman who lost his catch off the plain lance ; his joy when he held it on the barbed harpoon. The first good fisherman's tale must have started with some such exploit. Spearing fish sounds a little unreal to-day, but there is an interesting account in Sir Walter Scott's *Redgauntlet*, of sport carried on in this way on horseback. "They chased the fish at full gallop, and struck them with their barbed spears." The scene is laid in the estuary of the Solway at low water, when the "waters had receded from the large and level space of sand, through which a stream, now feeble and fordable, found its way to the ocean." Magdalenian man must have had many a good day's sport like this. Out of the barb of the harpoon, the fish-hook must have developed. All this was possible in bone, though an impossibility in flint. Bone lends itself to decoration, and so the Magdalenian incised simple designs on his lance-heads. Smaller bone points have been found which suggest arrow-heads, but no bows. These being wooden would have decayed. This influence of material on design is very important ; it is a very false and bad art which wastes material or tortures it into a shape which is unsuitable, so these early Magdalenians were proper designers, in that they used their material in a right way. The harpoons show them to have been fishermen, and there are Magdalenian drawings of seal and salmon engraved on stone. One expects that the

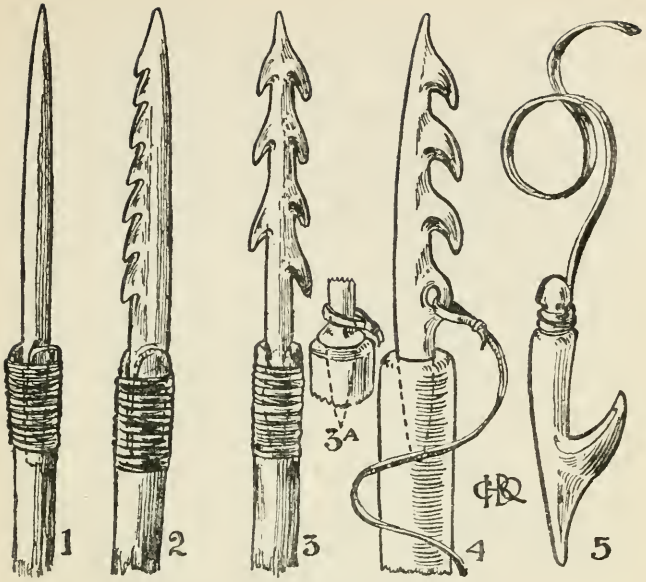

FIG. 54 —Spears and Harpoons.

rivers then would have been like those in Western Canada to-day, where the salmon come up from the sea in tremendous quantities.

Nos. 3A and 4 (Fig. 54) show another interesting development of the harpoon. Magdalenian specimens have been found with a movable head, and this suggests that they were used in the same way as the harpoons of the Eskimo. No. 5 is our suggestion of how the fish-hook developed out of the barb of the harpoon. As there are many other points of resemblance between the Eskimo and the Magdalenians, we will see if any useful comparisons can be drawn.

The Eskimo are very widely distributed, as they must be, because they live by hunting. They depend on the seal, whale, and walrus for food and clothing, and these they hunt all along the Arctic coasts from Greenland to Alaska. They are a very gifted pleasant people, who

have not any idea of war, because their main concern is a struggle for existence amidst ice and snow. They do not work iron, though in later days they have made use of any pieces which they could get hold of from traders. The Eskimo works in bone and wood in a really wonderful way, as we shall see. He also appears to have inherited the skill of the Magdalenian in drawing. Dr. Nansen writes of an Eskimo from Cape York, who " took a pencil, a thing he had never seen before, and sketched the coast-line along Smith's Sound from his birthplace northwards with astonishing accuracy."

We will start with their methods of hunting. Seals are speared at blow-holes in the ice, but far more interesting are the methods by which they are harpooned in the open summer seas. The Eskimo then uses his kayak; this is a boat as Fig. 55, which varies somewhat in the various districts, but in all is constructed on the same principle. On the west coast of Greenland it is about 17 feet long, and made of driftwood on a frame as Fig. 56, which is all bound together with thongs, and covered with sealskin. The kayak is decked over, and paddled with a double-bladed paddle. If we assume that the early Magdalenians were as clever as the Australians, and first made a bark canoe as Fig. 39, they would have found, as they left the rivers and ventured to sea, that the deck was an improvement. The harpoon with movable head (as 4, Fig. 54) suggests that they did go to sea, and attacked some larger quarry than the salmon. If they harpooned the seal with No. 3, the first convulsive plunge would have snapped off the head, and this was a precious possession. The head was made then to fit into a bone holder on the end of the lance, so that when the seal dived he wrenched it out of the holder only to find that it was still attached to the shaft by a leather thong. The Eskimo uses two harpoons, which are very beautiful developments of this idea.

No. 1, Fig. 57, shows their bladder dart. The head is removable and attached by a thong to the centre of the shaft, where in addition they fix a blown-up bladder. When the seal dives he is encumbered by the shaft, which is at right angles to the thong, and the bladder, which also marks his position when he comes to the surface.

No. 2 shows the Eskimo harpoon. This had in old

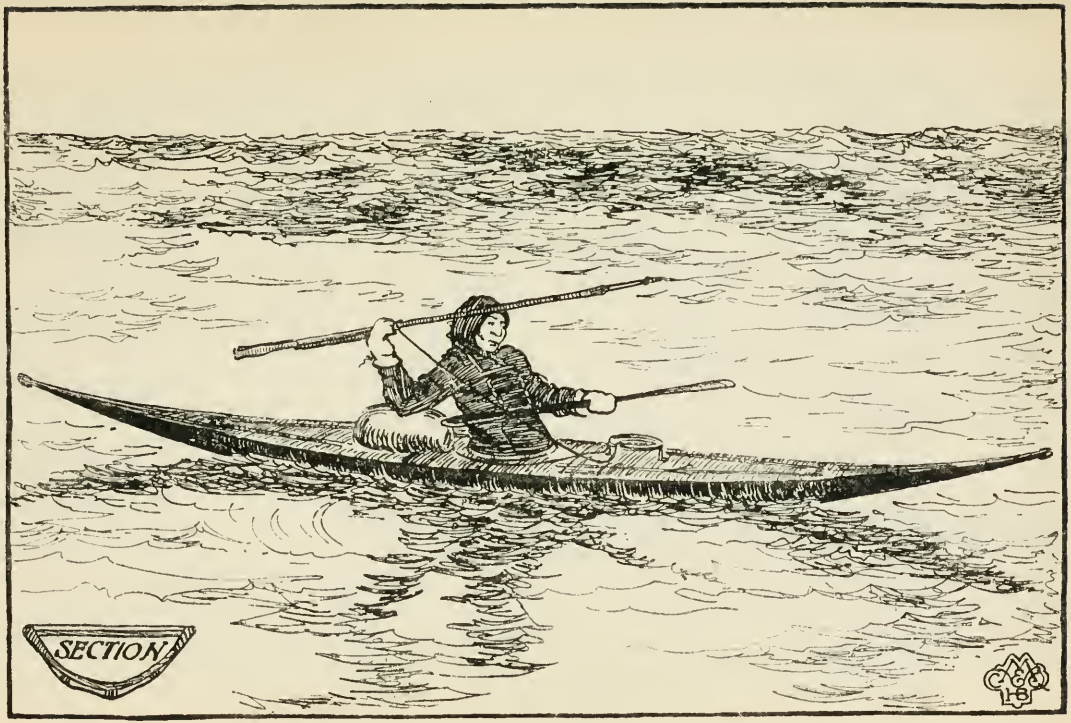

FIG. 55.—The Kayak.

Fig. 56.—Framework of Kayak.

days an ivory head, tipped with flint, fitted on to a bone shaft. This latter is protected from snapping, by being attached to the wooden shaft with thongs in a sort of ball and socket joint. The line is attached to the ivory head, and then passes over a stud on the harpoon shaft ; the loose line is carried on a holder on the kayak in front of the Eskimo, and the end is attached to a large sealskin float which rests at his back. The harpoon is thrown with a thrower in the same way that the Australian hurls his spears (Figs. 34 and 35). The head of the harpoon buries itself in the seal, and is so attached to the line that it turns at right angles in the wound. It is at once wrenched off the bone shaft, and the position of the seal is noted by the float which is thrown overboard. The wooden shaft floats and is picked up.

As there are many very beautiful ivory or bone harpoon-throwers of Magdalenian times, it seems fair to assume that the seal was hunted then as it is by the Eskimo to-day.

No. 3, Fig. 57, shows the bird-dart which is thrown with a thrower. The forward projecting barbs kill the bird if the actual point misses. All these weapons are carried by the Eskimo on the deck of the kayak, neatly fitted under thongs and ivory studs.

The Eskimo's clothing is of sealskin, and his coat is arranged to fit closely around the circular rim of the hole in the deck in which he sits. He can be tumbled right over by a rough sea, and yet right himself with a turn of the paddle.

The Magdalenian had bone needles, and his clothing may have been like this.

At the British Museum there is a sledge made of drift-wood, with bone platings on the runners, all tied up with thongs. It should be seen to realize how primitive man manages without nails and screws. As well there are kayaks and a model of the umiak or women's boat. Fig. 58 shows an Eskimo game played rather like cup and ball. A very much simplified Polar bear is carved in

ivory and pierced with many holes; the bear has to be caught through one of the holes on the end of the stick.

The boring of holes brings up the question of whether Magdalenian man used the bow-drill. Small ivory rods have been found, perforated at one end, with a slit at the other shaped into a mouth. This is thought to have been the bow. The bowstring was tied through the hole at one end, given a twist round the drill, and the bow then being bent, a loop in the bowstring was slipped into the notched end of the bow, and kept the latter bent. Our cut (Fig. 47) shows how the drill could then be rotated. Such drills are used by the Eskimo, and many other primitive people to-day, both to bore holes and produce fire by friction.

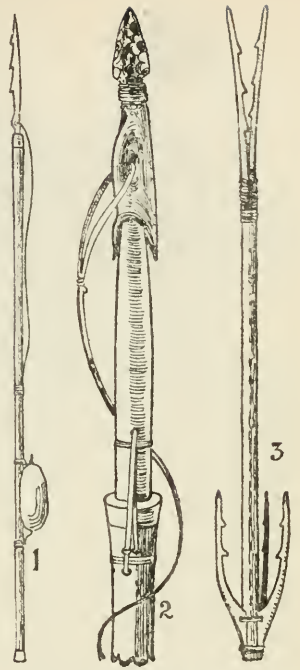

FIG. 57.—Eskimo Bladder Dart, Harpoon and Bird Dart.

Drawings have been discovered which are thought to represent tents or huts, and suggest that the Magdalenians had improved on those of the Aurignacians, as shown in Fig. 44. This round beehive form, made perhaps of willow withies, would have been weak in the crown, if the tent was of any size, yet it could be constructed very simply anywhere that saplings were found. One of the Magdalenian drawings suggests a type, as Fig. 59. Almost all the early hut builders seem to have dug a hole in the ground of circular shape. The earth removed was heaped up round the outside. In the centre of the hole a roof tree was set up, formed of the trunk of a tree, with a fork perhaps left at the top. Around this saplings were placed, their feet stuck into the surrounding mound, with the

Fig. 58.—Eskimo Game.

tops leaning against the roof tree. These formed the rafters, and if in between these were interlaced smaller boughs, it is quite easy to see that the whole could be covered with skins, or rough grass thatch. Quite a comfortable little house could be made in this way, and we know that it is a type which was general in Neolithic times.

Other Magdalenian drawings suggest a type, as Fig. 60, and this is a form of hut which is constructed by the North American Indians.

The Magdalenians had their winter quarters in caves and rock shelters, and the period is named after the cave of La Madeleine on the banks of the Vézère. Did Magdalenian man, as he slowly travelled to the north, take with him a memory of the rock shelters of France, and hand down a building tradition to the Eskimos of to-day? They have very interesting rock houses, and others which are constructed in a skilful way with blocks of snow. Stone lamps have been discovered, which suggest that the Magdalenian not only lighted but warmed his houses, as the Eskimo does to-day, by burning fat in a stone lamp with a moss wick.

Fig. 61 shows the skin tent which the Eskimo uses on his summer wanderings. The plan resembles that of the houses; there is the semicircular bed-place at A, and a central gangway at B, with cooking pots at the sides at C. The diagram shows how the tent is made with poles and covered with skins, the front portion being of membrane to admit light. Large stones serve to hold down the

FIG. 59.—Type of Huts suggested by Magdalenian drawings.

skins. We have included these drawings because we want to get as many representative types as we can of primitive dwelling-places. We shall find it useful later on.

The Magdalenian, like the Eskimo, may have used his lamp for cooking, but here is an interesting description by Darwin of a Tahitian who prepared a meal in another way: "having made a small fire of sticks, placed a score of stones, of about the size of cricket balls, on the burning wood. In about ten minutes the sticks were consumed, and the stones hot. They had previously folded up in small parcels of leaves, pieces of beef, fish, ripe and unripe bananas, and the tops of the wild arum. These green parcels were laid in a layer between two layers of the hot stones, and the whole then covered up with earth, so that no smoke or steam could escape. In about a quarter of an hour, the whole was most deliciously cooked." This was a method used in Neolithic times later on. The Magdalenians may have used the reindeer for food in the winter, by drying the flesh over a wood fire, and then

FIG. 60.—Type of Huts suggested by Magdalenian drawings.

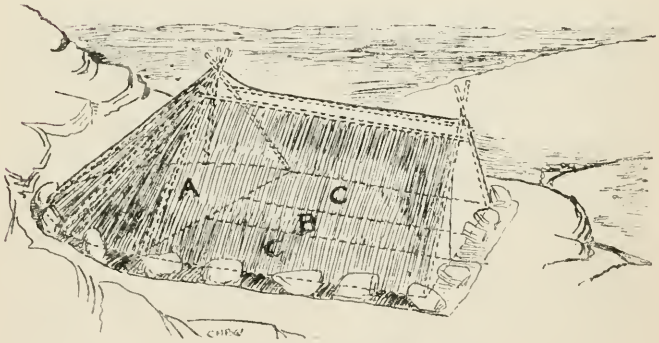

FIG. 61.—Eskimo Summer Tent.

pounding it up, and preserving it by pouring over hot fat, rather like the pemmican of the Indian and Eskimo.

Fig. 62.—Digging-stick.

We cannot be sure whether the Magdalenians had started cultivating the soil. Perforated stones have been found which may have been used to load the digging-stick, as Fig. 62. This is the method the Bushmen adopt, and Darwin mentioned the use of the digging-stick in Chile, to dig up roots, though this does not mean cultivating them.

The Magdalenian period marked the highest development of the art of prehistoric man. The paintings are of astonishing merit ; without being great sticklers for detail, these old painters caught the very spirit of the animals they painted. The mammoth swings along alive from the tip of his trunk to the end of his tufted tail. The bison and boar charge ; the reindeer and red deer move in a slow, easy canter. The drawings are proof of the immensely developed power of detailed observation which came to the hunter as part of his craft, and which is different to the sympathy shown in later days, when animals were domesticated. Fig. 63 shows a Magdalenian painting of a boar, and the frontispiece, Fig. 1, a bison, from the Altamira Cave.

The artists of those days used reds and browns, blacks and yellows, and were adepts at producing high lights, half-tones, and shadow. They appear to have started with a black outline, and then to have fitted in the body of the work, adding tone, or wiping away colour to get the effect of lights. The figures are often of life size, and their vigour makes us wish that we could draw animals in such a living way.

M. Daleau has found in France, red oxide of iron, which formed the basis of one of the colours, the pestles with which it was ground, and the shoulder blades of animals that served as palettes. Brushes were used, and would not have been difficult to make. The paints were carried

FIG. 63.—Magdalenian Cave Painting.

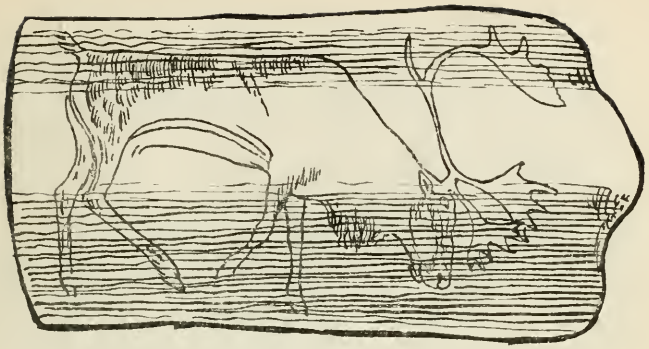

FIG. 64.—Grazing Reindeer, engraved on a round bone.

in little tubes made of reindeer horn ; truly there is nothing new under the sun, and we shall find some day, perhaps, a catalogue of a Magdalenian artists' colourman. We have said that these old painters caught the very spirit of the animals they drew, and to do this they realized that it was necessary to compose, or design, their shapes and outlines. To-day we can snapshot a horse while galloping, and the resulting photograph will not convey the sense of action that the Palæolithic artist has obtained in Fig. 63. This is because the human eye cannot record movement with the rapidity of the lens of a camera. The artist realizes this, and presents instead a convention, or design, which we find more real than the reality of the photograph.

The Magdalenian engravings on ivory, sometimes on the handles of their shaft-straighteners, were just as wonderful as the paintings. There is one in the British Museum from La Madeleine, of a mammoth which is splendid in its vigour. Figs. 64 and 65 are fine examples of engraving on bone. Fig. 66, of an ivory dagger at the British Museum, shows that Magdalenian man could carve in the round, as well as cut an incised line. Fig. 67 shows a harpoon-thrower, the use of which was described on p. 88. Remember that all the engraving and carving was done with flint implements.

FIG. 65.—Deer crossing a Stream, engraved on a round bone.

The drawings and engravings convince us that the artists knew the animals, and that their work was actual life-drawing; in this way we can find that among the Magdalenian animals were mammoth, reindeer, and the great Irish deer, the bison and horse, the musk ox, glutton, and Arctic hare. These show that the climate was for some part of the Magdalenian period colder than in Aurignacian times.

The illustrations we have given are sufficient to prove that the Magdalenians were a very highly gifted race. These people were becoming civilized, and they were artists, and so would have been pleasant and friendly. We cannot say how they said "How do you do" to one another; perhaps like the New Zealanders they rubbed noses. Darwin when he went there wrote: "they then squatted themselves down and held up their faces; my companion standing over them, one after another, placed the bridge

FIG. 66.—Magdalenian Carved Ivory Dagger.

of his nose at right angles to theirs, and commenced pressing. This lasted rather longer than a cordial shake of the hand with us ; and as we vary the force of the grasp of the hand in shaking, so they do in pressing. During the process they uttered comfortable little grunts."

To sum up, if it is correct, that certain bone rods which have been found at Aurignacian stations in France, are the bows of bow-drills, as Fig. 47. then this must be noted as another very considerable step forward. It is obvious that the Aurignacians must have had some ready method for drilling their shaft-straighteners as Fig. 46. The bow-drill led to the modern lathe. We shall see that in later times the people knew how to turn quite well, and it is probable that they used a type of the primitive pole lathe. In this the rotary movement was conveyed, to the article to be turned, by a rope which was passed around it in the same way that the bowstring was applied to the drill to turn it. The potter's wheel, which again follows later on, is descended from the bow-drill.

At the end of the third chapter we suggested that man, at first only concerned with food, had begun to realize that there was a spiritual side to his nature. In Magdalenian times we find the manifestations of this in an appreciation of beauty ; there were artists in those days.

Now Art is a much maligned word ; it really means *doing* things, whereas science is *knowing* things. People nowadays think of an artist as a painter ; we should like to define that individual as any man, or woman, who puts more into a job of work than they expect to take out of it ; the business man is one who wants to take out a little more than he puts in.

Fig. 67.—Magdalenian Carved Ivory Harpoon-thrower.

We should like to point out that an engineer may be a very good artist. A fine motor-car is a work of Art ; it has Beauty of form, and is designed with Truth, or it would not do its job, so that it possesses two of the great qualities ; there remains only Goodness. It therefore follows that no man can do fine work unless he has some appreciation of the underlying principles on which humanity has built itself up. At the very worst he can only be one-third bad, so credit must be given to the artists of all kinds.

We like to think that good work has been one of the prime factors in the civilization of man, and we believe that dull mechanical work destroys the brain. If this is so, what of the poor factory hand of to-day, chained to the machine as its slave ? It is not possible for him to dream dreams, or see visons ; the utmost limit of his, or her, endeavour, is, perhaps, to watch an automatic machine making nuts, each an exact counterpart of its fellow.

We wonder, when our turn comes to be dug up, and have our skulls measured, say in 5000 A.D., if the archæologists of that far-away tomorrow will say, Here was a people who threw away their heritage, and arrested their development, because they lost the use of their hands.

But so far as our friends the Magdalenians are concerned, judged by their work they had made great advances, and, like the Eskimo whom they so closely resembled, must have been a pleasant people.

FIG. 68.—Round-headed Ofnet Man.

FIG. 69.—Long-headed Ofnet Man.

CHAPTER V

THE END OF THE OLD STONE AGE

THE Azilians who followed after the Magdalenians, were the last people of the Old Stone Age. After this we come to Neolithic times, or the New Stone Age. The Azilians, like all these early peoples, were widely distributed, and traces of their handiwork have been found as far apart as the cave of Mas d'Azil, Ariège, near Lourdes in the south of France, and Sevenoaks and Hastings in England, and Oban in Scotland. The Scottish discoveries of harpoons are very interesting. It shows that the ice was retreating, and man making his way into the tracts of the newly uncovered land.

We know what some of the Azilians were like because they had a curious habit of removing the heads from the bodies of their dead and burying the skulls like eggs in nests. At the Ofnet Cave, near Nördlingen, Bavaria, South Germany, twenty-seven were found together buried in red ochre. This would suggest that the Azilians used to paint their bodies in their lifetime, and so the colour was buried with them for use in the spirit world. One skull of a small child had many shells placed near it—perhaps as

play-things. Round another was a chaplet of deer's teeth, and all were placed in the same way, looking westward. The actual bodies were probably consumed by fire ; later on cremation was a usual method, the ashes being buried in an urn.

Here is a new fact; most of the old races we have been writing about were long-headed (dolichocephalic); we now find side by side with this type, brachycephalic, or a rounder headed people. The fact that individuals of the two races were buried in the same grave points to their having lived together happily. So that if some Magdalenians moved north after the mammoth and the reindeer, others remained behind.

Our drawing (Fig. 68) has been made from the rounder headed Ofnet skull. Fig. 69 is of the longer headed type.

We do not find any beautiful paintings in this period. Man was beginning to look on animals from a different point of view. In the old days he had the hunter's eye, quick to note beauty of body and grace of movement, which he expressed in drawings ; in Azilian days he may have begun to look on himself as a herdsman, though so far only the dog was domesticated. The climate was milder, with westerly winds and warm rains; the waters were rising. Great Britain was an island, and great forests spread over the land, except where the Loess lay thick (p. 14), and by fineness prevented the trees from taking root. Man, who had been free to roam over the tundra, was now hemmed in, so the old care-free life passed away, and he began to have possessions.

These had to be useful, and we do not find any cunning work in ivory. The awl takes the place of the needle. Flint is revived for making implements, but in a rougher way than those of Solutrean times. Stag horn is used for harpoons instead of reindeer, so the Azilians also were fishermen.

The most interesting things which they have left behind them are the painted stones found at Mas d'Azil. These are flattish in shape, about 2 inches across, and painted with signs, as Fig. 70. Some of them are surprisingly like early forms of letters—red and black was used. The use to which these stones were put is unknown, but they may have been tallies or accounts. If to-day you ask

FIG. 70.—Azilian Painted Stones.

a labouring man to cart bricks or tiles, and keep count, he will do so in tens. These he chalks up on the barn door, and obtains his hundreds by ten tens. So these stones may have been tokens or tallies used by Azilian man in keeping the accounts of his trade by barter. We can be quite sure that some sort of trade had been in existence even long before this time. We have seen on p. 83 how cowrie shells were found with the Crô-Magnon type of skeleton at Laugerie-Basse. Four were near the head, and two at each elbow, knee, and foot. They must have been sewn on the clothing. These would have come from the Mediterranean, and would have been rarities in the centre of France. The chiefs would have desired them on the principle that fine feathers, or shells, make fine birds, or men. So perhaps skins or harpoons were given in exchange. Don't be amused at these simple folk, because the exchange of commodities still remains as the basis of our trade, and we use money or bills of exchange as tallies or tokens. Life was becoming easier, and was perhaps not so much of a desperate struggle for survival as it had been.

The Glacial Period had receded into the past, and the climate was temperate. Whereas in Magdalenian times the countryside had the appearance of the Arctic tundra where the Eskimo now live, in Azilian times it became well wooded.

Before we leave the painted stones, we must draw attention to the fact that some of the markings are very much like Roman letters. From this some archæologists have argued that the stones were the text-books from which Azilian boys learned their A B C. This is a tremendous flight of imagination, and a short cut indeed at the same time We feel that the Roman letter had to wait for thousands of years yet before it arrived at the character we know now. Turn the subject over in your mind, and think how prehistoric man conveyed informa-

tion or asked for it. Our early friend, the Java sub-man, had rudimentary powers of speech ; he progressed as a baby does now. Our own very youngest brother learns to say " bread," because his small brain teaches him that this is what the grown-ups call the stuff which is so pleasant to eat ; speech comes first, then letters. All letters seem to have started as pictures. We know prehistoric man could draw splendidly ; if he met a man who did not understand his own language, he would naturally draw the thing he desired to obtain. We remember once buying a goose in Wales, from an old lady who spoke only Welsh, which we did not understand. We pointed to the goose, and by signs conveyed the idea that we wished to buy it. We then in the same way invited her to take as much money from our hand as she desired ; but we wished her to kill, draw, and deliver the bird in time for dinner the next day, at a farm some miles away. So to the great delight of the old lady we drew pictures of the doom and journeyings of the goose, and in due course we dined off it ; but this would be a very laborious method for all the actions of everyday life. The drawings then were standardized and simplified and in time became letters, and our old A B C, like everything else, has behind it a history stretching out across the horizons into the very beginnings of time itself. Our readers will know Kipling's delightful tale of *How the Alphabet was made*, in " Just So Stories."

The probable Azilian deposits at Oban were found in a cave opening on to a sea-beach. Prof. Sollas mentions the fact that in a beach at Glasgow, which corresponds in age with the one at Oban, no less than eighteen dug-out canoes have been discovered. These may have belonged to Azilian man. On the rocky floor of the cave at Oban were successive deposits : first a pebbly gravel washed in by high tides, then a bed of shells, then gravel, and on top of this another shell-bed with a final topping of black earth, formed in later ages. The level of the land has gone up, perhaps as it lost its tremendous load of ice, or that of the sea gone down, because the cave is now some 30 feet above the sea-level.

In the shell-beds are shells of oysters, limpets, whelks, the claws of lobsters, the bones of large sea fish, red deer,

goat, pig, and many other animals. Ashes remain where the cooking hearths were. From all these remains we can be quite sure that Azilian man was both fisherman and hunter, and the bones of the large sea fish mean that he took his harpoon to sea, in some form of canoe, or boat, covered with skins.

Man about this time seems to have been drawn more and more to the water. In Norway and Sweden, Azilian remains have been found which point to dwellings built on enormous rafts anchored in lakes. All sorts of implements fell through the logs of which the rafts were composed, and have since been discovered in the peat which has formed in the old lake beds. Flint implements were used, and harpoons, spear-heads, and fish-hooks. The bones of dogs have been found, and it is thought this proves that they were domesticated by the Azilians.

We do not know why man should have chosen such strange homes for himself and his family ; probably fear drove him there, but he had now no foes to fear like the sabre-toothed tiger. That fierce animal had long since gone ; perhaps it was the most terrible foe of all, his fellow-man, of equal cunning with himself, and far more subtle than the clumsy mammoth, that compelled him to take refuge on the water. We shall see how in Neolithic times he built the Lake Dwellings on piles, and lived over the water, as he does to-day in New Guinea. If at about this time the dog became the friend of man, then again this marks another very notable step, and it would be extremely interesting to know how the long friendship began. Kipling in the " Just So Stories " gives us an idea. It is a proof of great intelligence on the part of prehistoric man, because the dog would have been as useful an ally as fire, and flint, as well as being an excellent companion. It is almost impossible for us to imagine a world to-day with only wild dogs and wolves in it.

We wanted to sum up the general impressions to be gathered from the life of prehistoric man, and the dog gives us the opportunity of doing so, by showing the difference that he made to man when he became friends.

We have seen that the most urgent need of prehistoric man was food ; that as he had not domesticated any of the animals, except the dog, and did not grow any corn,

he had to hunt to live, and was a wanderer because he followed the game. When the dog came as a friend, he brought an even keener sense of smell than that of prehistoric man, and so could follow the trail; at the same time he would have simplified the task of stalking the animals. It was necessary to get within the limited range of a spear thrown by hand, before prehistoric man could kill his supper, and the dog would have helped by driving the game towards the hunter.

With a more acute sense of hearing, the dog would have given prehistoric man the feeling of security which he so badly needed. The man would have been afraid of so many things; the nasty little noises of the night would have alarmed him so much more than the howling of wolves, which he knew; there was the constant dread of magic and evil spirits. Prehistoric man then, crouching at the side of his camp-fire, looked out into encircling gloom, and saw the firelight reflected in the eyes of wild animals with more assurance when he had the dog beside him for a friend; if the supper had to be shared, the dangers seemed to be halved.

If we go back and think of the other things we have written about, we must bear in mind that the ancient hunters were helped in their wanderings by a differently shaped Europe to the one we know to-day. The isthmuses at Sicily, Gibraltar, and Dover, not only led to wide wanderings on the part of Palæolithic man, but opened the way for interesting migration of animals. The Southern types could come North, and the Northern go South if need be.

Great climatic changes, like the Ice Ages, played their part in man's development, by adding the stern necessity of altering his mode of life, if he wished to survive. We look back on a Europe of those days, as on a broad but dimly lighted stage. Across it pass the huge *E. antiquus*, the hippo, and sabre-toothed tiger, later come the mammoth and reindeer, with hyænas, lions, and bears; and man moves among them and seems to have changed least of any.

Mr. Crawford, in his book *Man and his Past*, has taken an idea from Samuel Butler's *Life and Habit*, and applied it to prehistoric man; it amounts to this, that man by the use of tools has added limbs to himself. He rides a bicycle

to-day and, by the use of gears, progresses as rapidly as if he had as many legs as a centipede. A flint implement was as useful to prehistoric man as another hand.

No animal uses tools ; they will use beak, claw, and tail as tools, which is a different matter. Man then, in times of great changes, was not called upon to alter his own body, to suit the altered circumstances. The animal does this, or rather in many generations, and at the cost of countless lives, it is done, or, as in the case of the great reptiles, the type becomes extinct. The weather becoming colder, the animal will gradually develop and grow a thicker coat, but man, with his tool, makes himself one quickly, and so leaves time to do all sorts of other things as well.

In using his tools, man was worried and made to think ; his brain, and soul, chained up in the clumsy body, were stimulated by this endeavour to do work. It is this tool-using habit of man, and all that it means, which makes the early flint implements so interesting ; the hand-axes and scrapers, the borers and burins, have been prime factors in civilization, and their utility has many times meant the difference between life and death to whole races.

Then we have the tremendous revelation of Magdalenian art, blazing up in the middle of the Stone Age, and then the flame being extinguished ; how did this come about ? In any summary of the Old Stone Age, there is always this problem to be thought of.

It was the tools of prehistoric man which made possible the beginnings of so many other things. The harpoon must have been used from some sort of boat or canoe. The huts have developed into our houses ; the perforated wolf's fangs, or cowrie shells, strung together as a necklet, and the hollow base of a mammoth's tusk sawn off as a bracelet led the way for all the other people who wanted to make themselves beautiful. Bone needles made fine sewing and embroidery possible ; all this is part and parcel of archæology, and there still remains plenty to do.

Archæology is like the design of a Roman pavement, built up of many small fragments, or tesseræ. The main design is beginning to be known, but many of the details are missing. It is for this reason that research work goes on ; that camps are dug over, and ancient cities uncovered. Many months' work may result in just one small piece of new

knowledge. The archæologist is delighted, and tells all his friends, and the little new tesseræ is fitted into its place in the larger pattern ; but first it is tested in all ways, to see that it really fits, because these people are learned, and jealous that before any addition is made it shall be real knowledge.

If this book has given any of our readers any idea of even the outline of the pattern of this knowledge, we shall be very happy, because they can then start serious work on their own account. We can then pass on to how Neolithic man carried on his everyday life, which will be the subject of our next book. And now, in the friendliest way possible, we should like to take leave of our readers for a little time.

"The Dance" by P. C. Q.

INDEX TO TEXT AND ILLUSTRATIONS

NOTE.—*The ordinary figures denote references to pages of text, those in black type the Illustrations.*

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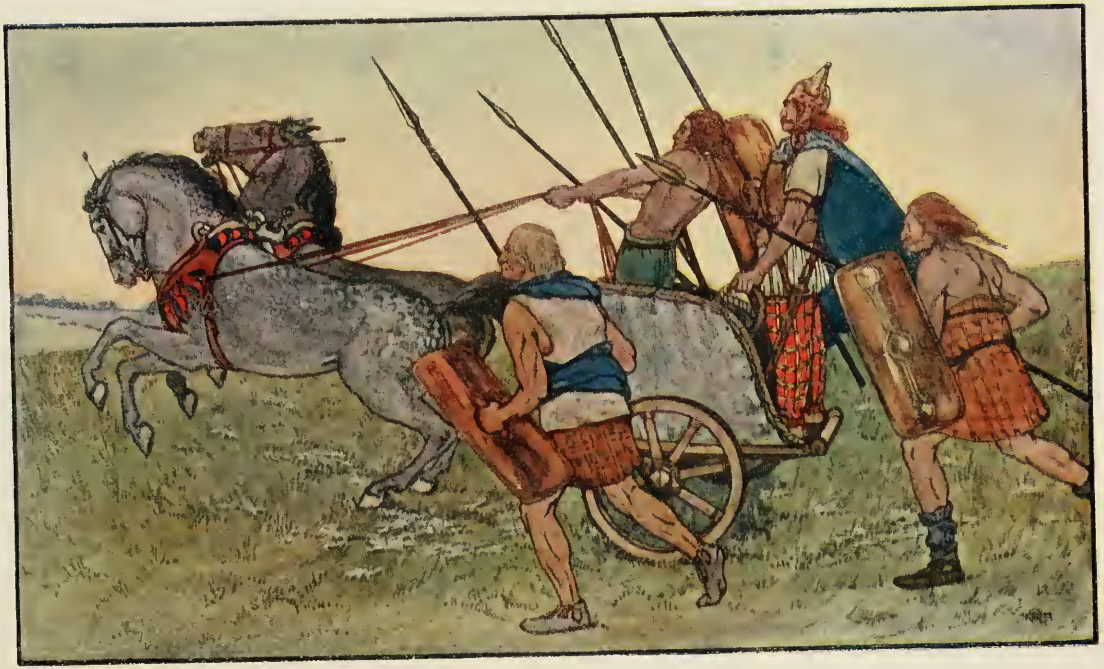

FIG. 1.—Warriors and Chariot of the Early Iron Age.

To face Title-page.]

THE EVERYDAY LIFE SERIES—II

EVERYDAY LIFE
IN THE
NEW STONE, BRONZE & EARLY IRON AGES

WRITTEN & ILLUSTRATED BY
MARJORIE & C. H. B. QUENNELL
Authors of "Everyday Things in England"

"For he who would proceed aright in this matter should begin in youth to visit beautiful forms; and first, if he be guided by his instructor aright, to love one such form only—out of that he should create fair thoughts; and soon he will of himself perceive that the beauty of one form is akin to the beauty of another; and then, if beauty of form in general is his pursuit, how foolish would he be not to recognize that the beauty in every form is one and the same."

From the speech of Socrates,
Symposium of Plato.

Design by P. C. Q.

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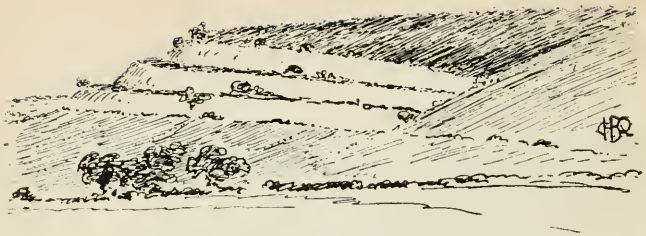

FIG. 2.—The Linces, Cheddington, Bucks.

INTRODUCTION

THIS book, like *Everyday Life in the Old Stone Age*, and *Everyday Things in England*, is primarily intended for boys and girls of public school age, but may be of some interest to their elders. It can only be an outline, but we hope that as such it will give our readers a broad view of certain principles which have governed the work of man. One of the first facts to be understood is this, that man when beginning very wisely models his work on something which has gone before. We can test this by thinking of the first motor-car, it was like a horse-drawn carriage with an engine under the driver's seat, only without the horse. The first train was a string of stage-coaches linked up to "Puffing Billy." We call the man who is responsible for maintaining the power in a modern engineering shop, a millwright, because he is the lineal descendant of the man who first produced power, by making wind and water mills. If we go back to prehistoric times we find that the bronze celt, or axe, was at first of the same shape as the stone one which had preceded it. Having made a start, by the adoption of a new material to an old form, man very soon discovers its possibilities and so progress is made. History, then, cannot afford to neglect all these points of contact, which link up the development of man, and the influence which his work has had on him. The tale is a long, long tale, that goes back to the time when the man of Java descended to the foot of his tree, and upending, walked abroad to play the part of man.

Another point to be borne in mind is that all work in its designs and construction is closely related. Nowadays the specialist tries to shut off one trade from another in water-

tight compartments, but if we come to a proper understanding of the matter, we shall find that, if we have the science of knowledge, the art of performance is not so much a mystery as some would have it.

It may seem strange to suggest a wide view at an early stage, but how else can one see life as a whole, and determine what we are going to do. We shall, later on, talk much of the Hills, because men lived on the Hills in the time we are writing about. To live on the hilltops is good, for as we walk along the old trackways, we can look down on the flat vales, and see the white roads winding through the cornfields, and the villages clustered round the churches. We get a fine idea of the lie of the land ; there may be a grubby patch on the horizon, where the smoke of an industrial town poisons its inhabitants ; we will not go that way. So resting on the hillside now, we can map out our path, because once we are in the vale, among the trees, and in the villages, we shall be caught up in the throng, and lose our sense of direction. Our work, then. is to present in these books an outline of knowledge, which may lead to specialization later on. Before we pass to the subject-matter of this book, we should like to give a reminder that when we talk of the Old Stone or Palæolithic Age, the New Stone or Neolithic Age, followed by those of Bronze and Early Iron, we are using terms invented by the archæologists to denote various stages in the development of man.

We have to think of man's development, proceeding continuously, though not always improving or progressing. We found out in Part I. that man is rather like a tree. The race has periods of youth, and passes by way of flower, to fruition, and then decay, but always there is the promise of re-birth, so that the morsel of achievement which Nature deems worthy to survive may be carried on. It would be dismal without this promise, and the larger view of history an intolerable misery if we had not the hope that all will come right in the end. So we must be prepared for periods when the gods seem to nod and slumber, and little progress is made. There are other periods, like the one we are living in to-day, when the miseries and suffering, caused by a Great War, can only be remedied by a determined effort on the part of all the people, to be decent and kindly, and to do good work.

We must bear in mind, in dealing with this Neolithic period, that moving impulses in the direction of progress will be born out of favourable conditions, and intelligent peoples in some particular place, and that the impulse will spread from this to other parts of the world, so that one part of Europe, for example, will be ahead of another, and the movements and periods will overlap. Bronze may have been used in one place, while in another stone was still employed.

Another reminder must be that we are still, even up to the end of the Early Iron Age, and the coming of the Romans, for all practical purposes, so far as Britain is concerned, in the Prehistoric period, so called because it deals with all that time before there were written histories. We shall find then in the New, as in the Old Stone Age, that our historians are of the pick and shovel variety, because they have actually to dig in mother earth for the remains of man and his works.

Having discovered Neolithic man and his simple apparatus for living, we shall have to do what we did in Part I., search for modern primitive races, as a model of what prehistoric life may have been like. Here we must be careful that our models are real primitives, and not degraded races, and there is all the difference in the world. The real savage is very frequently a person with unexpected virtues and cleverness, and a moral and spiritual code which is found to be admirably suited to his surroundings. We discovered this of the Australian native, through Messrs. Spencer & Gillen's books, to which we referred in Part I. In this book we have drawn on an admirable account of a gifted people, the Akikúyu of British East Africa, given in a book by Mr. and Mrs. Routledge, which we recommend to our readers.

These people are quite different from those tribes who, often by contact with the worst sides of our civilization, have become hangers-on, and so have fallen from high estate. Frequently it is this latter type which is first thought of, so we implore our readers to clear their minds of any such misconception, and think of early man as being the child of mankind, on the threshold of the world's life, with all that it held before him, testing its possibilities, and trying conclusions with it.

Again, there is the effect of emigration to be considered. To-day, if a tramp determines that instead of starving here,

he will go to America, and make his fortune, he is a pluckier type than the tramp he leaves behind, and he is of more use to America, than the one remaining here is to us.

The development of man has depended on the struggle for existence, and the quality of the fight which he puts up against his difficulties. The more virile types which a country possesses, the greater progress it will make.

Our early immigrants, the Mediterranean men, the Bronze Age men, the Brythons, and Belgæ, of whom we shall tell in this book, were of great value to our country, and all played their part in its development.

We must try to appreciate this idea of movement and energy. We must think of man as a worrying individual, consumed by curiosity, and always trying experiments; failing dismally and losing heart; trying again, and meeting with some little success which spurs him on. His inspirations is like the pale flame of the will-o'-the-wisp, sometimes it leaps up and burns brightly, at others dies down, but always it eludes him, and never can be grasped. If you come to think about it, this is just as it should be, because perfection is finality.

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MARJORIE AND C. H. B. QUENNELL.

BERKHAMSTED HERTS.
August 1922.

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EVERYDAY LIFE IN THE NEW STONE, BRONZE & EARLY IRON AGES

CHAPTER I

THE NEW STONE AGE

Before the New Stone Age

BEFORE we begin with the doings of the men of the Neolithic or New Stone Age, it may be as well to give our readers a reminder of the periods which are associated with the Palæolithic or Old Stone Age with which we dealt in Part I.

We started with the period of the River Drift, so called because of the flint implements found in the gravels deposited by rivers. Man lived on the banks of the Thames up to Oxford ; along the Lea to the Dunstable area ; around the Solent and Avon in Hampshire, and the Wey at Farnham, and on an area in E. Anglia, bounded by Thetford, Hoxne, Bury St. Edmunds, Mildenhall, and Lakenheath.

Then we came to a period when men lived in caves, like Kent's Cavern and Brixham Cave, N. and S. of Tor Bay, Wookey Hole in Somerset, Cresswell Caves in Derbyshire, and others in Wales.

Finally we saw how, at the end of the Old Stone Age, man seemed to have been drawn, or driven, to the water. The people, called Azilian, after Mas d'Azil (France), lived on great rafts anchored in the middle of lakes, as at Maglemose, Denmark. At Oban in Scotland, Azilian deposits were found in a cave opening on to a seabeach. This Azilian

civilization is the first of which we have any evidence in Scotland during the Old Stone Age, and we must not forget that the Northern part of Great Britain was covered with ice during the Glacial periods, and probably was too bleak and desolate in the Interglacial periods to attract settlers, until the ice had finally retreated in early Neolithic times. France was always ahead of us in civilization, because the greater part of it was never glaciated.

At Oban were found the bones of large sea fish, red deer, goat, pig, and many other animals, and the life led there must have resembled that which we trace in the Kitchen Middens on the Danish coast. These middens are of the greatest interest, because they belong mostly to the earliest Neolithic period, and it is here that we shall start this, Part II. of our series.

The Kitchen Midden People

A midden is a rubbish heap, and in Denmark these mounds are sometimes 100 yards long, by 50 wide, by 1 high, and were formed of the refuse of the meals and life of prehistoric man. They are labelled there with the splendid name of *Kjökken-möddinger*, and are largely formed of oyster shells, with the bones of stag, roe-deer, and wild boar. The long bones have been cracked to extract the marrow. The people do not appear to have grown any crops, or domesticated any animals, except the dog, so they had not made any great advances on the civilization of the Old Stone Age. It must have been the pleasant loafing life of the beach-comber. The sea when it is angry casts up all kinds of edible flotsam, and in kindlier mood, at low tide, early Neolithic man could hunt over the rocks, as we do to-day during our summer holidays, and find lobster and crab, oyster and mussel, prawns and shrimps, and the humble winkle.

We find the remains of similar people, and their shell heaps, in different parts of the British Isles, and at the British Museum, in the Prehistoric Room, are flints from the Castle Hill at Hastings. These people possessed dug-out canoes, or skin-covered boats, with which to go fishing, and used harpoons like the Old Stone Age men. It may well be that, as their flint implements were rough and not very effective, they were forced to the seaside by the encroaching forests. As the weather improved, after the

Ice Ages, the trees grew, and man could not as yet make sufficient clearings in which to start agriculture.

The evidence that we can gain, points to this dim beginning of the Neolithic period, some 7000 to 10,000 years ago, as a time when the world was gathering its forces. The Old Stone Age culminated in the wonderful flint work of Solutré, and the Magdalenian paintings; after that came decline. The old hunters followed in the track of the Mammoth and the Reindeer, and reached northern latitudes, where their successors of to-day, the Eskimo, live. They left behind them the less virile types, and the early midden people lived, one thinks, in rather a kitchen atmosphere without the wit to mend their ways.

FIG. 4.—Danish Midden Axe.

Then wise men came out of the East, and later we shall try to show how we in England were affected by these migrations. There were kings in Egypt as early as 4500 B.C., and the Mediterranean, which had seen the Crô-Magnon, and Grimaldi men, in the Old Stone Age, was to see these others who, coming from the East, or South-East, in the New Stone Age, were to press along to the cry of "Westward Ho," and build up new civilizations.

Whether the midden people died out, or were stimulated by these new-comers we cannot be sure. They had domesticated the dog, and it may have occurred to them to do the same with other animals, and so save themselves the trouble of hunting.

This we find is the next step; man became a herdsman, and had flocks to tend. This added to his responsibilities; while as hunter, or beach-comber, his cares were few, he must have found that with possessions his troubles began. It was necessary to find pasture for the little flock, and in the winter, no matter how hard the times were, he must keep alive some few to carry on the strain; the animals needed guarding at night; better pots and pans were necessary for storing milk, and in a hundred ways he was moved to bestir and adapt himself to the new conditions which arose out of becoming a man of property.

We will now turn to the geographical conditions which

confronted Neolithic man in England, and the bearing which these had on his mode of living, and the necessity that he was under of finding pasture for his flocks.

In the Old Stone Age, men walked across dry land where the Straits of Dover are now (see p. 13, Pt. I.); but as the waters rose after the last Ice Age, the isthmus across got smaller and smaller, until England was completely severed. It is probable that this did not occur until some time after the beginning of the New Stone Age, and even then the Channel would not have been so wide as it is now for a long time. This was, and still is, the great Gate into England ; here have passed men of the Old and New Stone Ages, Iberians, Goidels, Brythons, Belgæ and Romans, Saxons, Danes, and Normans. There have been, and are to-day, other routes, but none that can compare with the southern end of Watling Street.

We have drawn our map (Fig. 3) because we want our readers to bear in mind the physical characteristics of England ; its shape ; its mountains and rivers ; where are the watersheds and the marshy ground. As we are going to add to this map, in each part of the series, we have drawn an England as we know it now, but readers will remember that constant alteration has brought it to its present shape. Thanet has been an island, and the Lympne Flats under water. The Wash and Fens were unreclaimed, and the East Coast by Dunwich has been steadily eaten away ; there have been alterations along the South Coast and by the Isle of Wight.

In the early Neolithic days, men could stand in Gaul and look across to Kent, and say, "There is another land there like our own ; there also can we walk dry foot on the hills, and find pasture for our beasts. The grass is growing brown here, let us go and see what the country is like."

On our map (Fig. 3) we have shown the chalk, and it will be noticed how closely Neolithic man kept to it. We might call them the Men of the Rolling Downs.

A drought in these early days would have led to great migrations, and the pressure from behind have forced the men on the coast to make the great adventure. The Old Testament contains the finest pictures of nomadic herdsmen. In Genesis xiii. we read how Abram and Lot returned out of Egypt, and there was strife between their herdsmen, because the land was not able to bear them, and Abram said to Lot, "Is not the whole land before thee ? Separate thyself, I

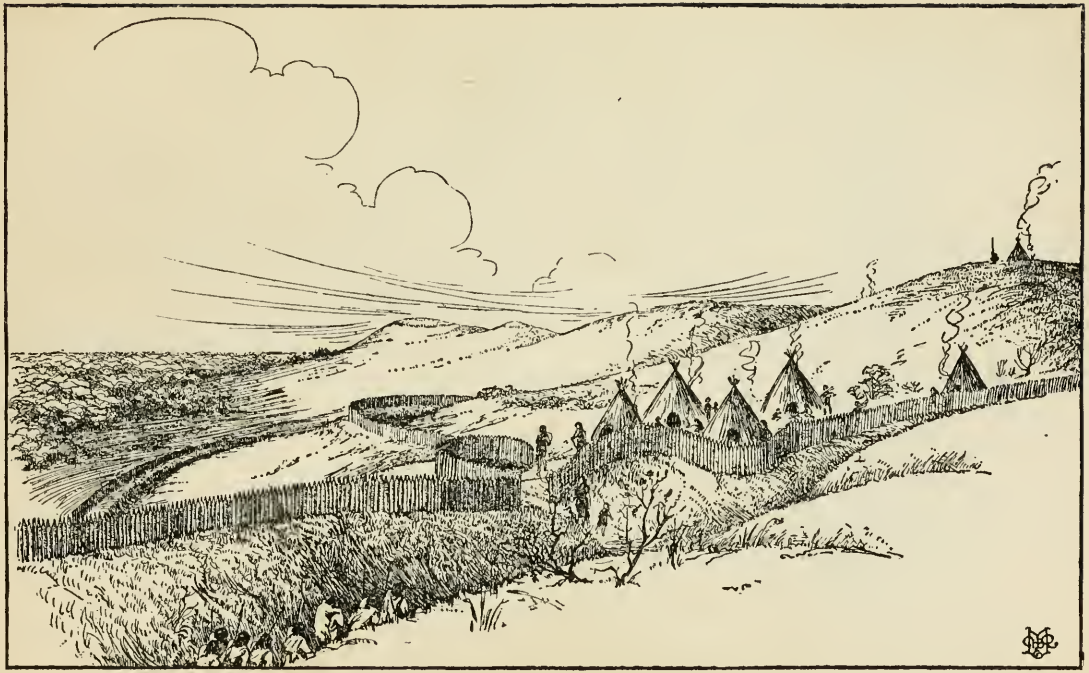


FIG. 5.—Camps on Pitstone and Ivinghoe Hills, Bucks.

pray thee, from me : if thou wilt take the left hand, then I will go to the right."

When the first Neolithic men arrived here, they would have found excellent pasture then, as now, on the Downs, and flint for their tools. They would have moved along the line of the old road later called the Pilgrims' Way, on the escarpment of the North Downs, secure from wolf or man. We find to-day traces of Neolithic man on this road ; there is Kitscoty to the N.W. of Maidstone ; the Coldrum monument to the W. on the other side of the Medway ; the pit-dwellings in Rose Wood near Ightham,—all dating from the New Stone Age. Neolithic man introduced sheep, goats, pigs, and cattle (*Bos longifrons*), like the small black Welsh cattle. These necessitated enclosures; so we find along the trackways on the Downs a regular system of earthworks where men, and cattle, could be secure against attack.

It is a curious fact that nearly all the Neolithic camps are above the 500 feet contour line ; we have shaded the parts below this on our map. There was, of course, a reason for this ; not only was pasture better on the Downs, but there were fewer trees. The country was far more wooded than it is now, and man had not as yet the implements with which to make extensive clearings in the forests. It is a mistake, however, to think of these as dense tropical jungles, because the climate then was temperate, as it is now. The undrained country would have been a more formidable obstacle than the forests, and places like the Sussex Weald all sticky clay. The forests were full of wild animals ; there was the Irish elk and the wild ox (aurochs), bears and beavers, wild cats and red deer, wild boars and the wolf, and Neolithic man hunted these with dogs.

Later and more adventurous immigrants seem to have coasted round until they came to the chalk at Eastbourne. They would have set out in their dug-out canoes, as Fig. 6, and some of these have been found as long as 50 feet. On the South Downs again are earthworks and tumuli, linked up by trackways leading to Stonehenge. Others came in at the Wash, which in these days extended to where the chalk is shown on our map, and here Icknield Way goes S. to the Goring Gap on the Thames, and then by way of the Berkshire Downs again to Stonehenge. Later on Maiden Castle, near Dorchester, and its connection with the trackways, points to traffic and trade by

FIG. 6.—Dug-out Canoe.

sea. The range of Neolithic man seems to have been the Downs, the Blackdown Hills to Devon and Cornwall, the Mendips, the Cotswolds to the Northampton Heights, the South Pennines and Lincolnshire Hills, the Yorkshire Wolds and Moors, and the Glamorgan Hills, and N. and W. of Scotland, and all these parts are connected by trackways which converge on Salisbury Plain and Stonehenge, which appears to have been the richest part of England in the Neolithic and Bronze Ages, and the seat of such spiritual and civil government as there was.

It should be noted that the trackways follow the water-sheds, and so avoid the crossing of rivers—a serious obstacle to flocks and herds. On the other hand, the great river valleys have formed avenues of approach for immigrants into the country, and the fact that so many of these are on the East Coast, has rendered us peculiarly liable to invasion on that side. The tide runs up the Humber and Ouse nearly to York; up the Trent just beyond Gainsborough, and the Thames to Teddington.

We must think, then, of a gradual penetration of the country, in Neolithic times, along the various routes we have indicated, which in the end became established traffic lines because of their convenience. The first rough stockades and earth-works on the trackways would have developed as time went on into the hill forts we find to-day. In the later days there must have been a more ordered system of government than any tribal law which had gone before. This is forced on us by the size of the works which these people carried out,

and which could only have been possible to a people content to accept some form of control.

We must bear in mind that when we talk of the Neolithic period, we mean a state of existence which is supposed to have lasted in this country not less than 3000 years and probably longer, that is, from about 5000 or even 8000 B.C. to 2000 B.C., and it may have started considerably earlier. To realize what a very long time this was, we must remember that only 1922 years have elapsed since the birth of Christ to our own days. Neolithic man, then, had plenty of time for the gradual beginnings which led up to the civilization of the hill forts of the trackways. Boys and girls should endeavour to see these. In our part of the world there is Icknield Way, with a contour camp on Beacon Hill, the Maiden's Bower, and Totternhoe. From Oxford you can take a 'bus to Wantage, the birthplace of Alfred, and from there climb on to the Ridgeway which runs along the Berkshire Downs. Cissbury is close to Worthing, and Maiden Castle not far from Weymouth, and every one should see Stonehenge. There is no more inspiring thing to do than walk along these trackways, which were old roads before the dawn of History as it is generally understood. If the day is hot, rest for a little while under a thorn, and then, perhaps, if you can dream dreams, and see visions, you may be able to join in spirit a party of Neolithic hunters or herdsmen journeying from fort to fort. It will be much more amusing than reading books, yet give your History a new meaning.

European Races

Perhaps, before we examine the works of Neolithic man in more detail, it will be as well to try and find out something about him, and the European Races during the Neolithic, Bronze, and Early Iron Ages. We can refer to ourselves as Anglo-Saxons or Britons, and yet be very wide of the mark. Assuming that we were cruising over Great Britain in an airplane, we could in a few days cover the length and breadth of the land, and if we kept our eyes open when we landed, we should find very varying types in our own country, except perhaps in the industrial areas which are pitiful conglomerations of misery.

In parts of Essex, and the South Midlands and Chilterns;

on the hills to the W. of the Severn in Worcestershire, Shropshire, and Herefordshire ; in Romney Marsh, the Weald, and the Isle of Ely, we should find a large proportion of dark-haired people with long heads, and the explanation of this is, that as these parts were off the main lines of Saxon immigration, the old British blood has lingered on. The Saxons penetrated into the country on the line of the Thames, and this element is strong in Berkshire, Oxfordshire, Hampshire, Sussex, and up the Thames Valley to the Cotswolds; here you will find fair people with blue eyes. In Leicestershire and Lincolnshire are Danish types with long faces, and heads rather high behind ; high cheek-bones, and well-formed noses ; they appear to have driven the Anglians to the Derbyshire hills in olden days. In Yorkshire we should find a typically English people ; shrewd, vigorous, and obstinate ; successful in business ; hard-headed and practical, yet with a great love of music. In the Shetlands, Orkneys, Hebrides, and parts of Caithness are splendid men of Norwegian descent. In the Highlands a Gaelic stock, quick-tempered and emotional ; in the Lowlands, and the eastern coast-lands, a frugal hard-working people descended from Angles, Danes, and immigrants from the E.

FIG. 7.—Mediterranean or Iberian Man.

It is obvious, then, that our own island provides us with some very fair samples of the European races, and if we are to understand our own history, or must discover where these types have come from, this means crossing to the mainland.

The European Races have been divided into three large families or groups. The Nordic, Alpine, and Mediterranean, and the history of Europe is a recital of the migrations and minglings of these types. Nordic means Northern, and

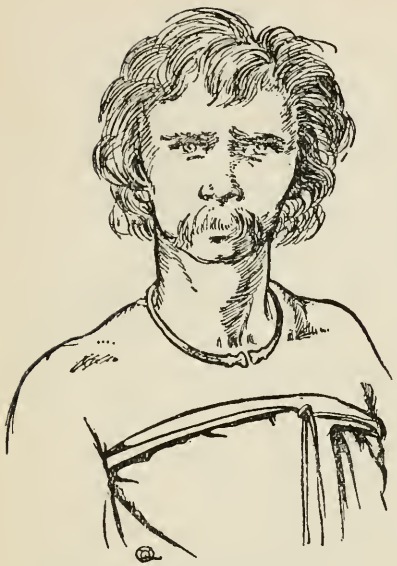


Fig. 8.—Alpine or Celtic Man.

this type is sometimes called Teutonic; these people came from the steppe region to the N. of the mountains between Europe and Asia. As the climate improved after the last Ice Age this became forest. The people were tall and strong-boned, with fair hair, and blue eyes, and they were long-headed.

The Alpine people came from the mountain zone of Europe; they were thick-set, and round-headed.

The Mediterranean or Iberian men came from the coast-lands of that sea; they were dark, long-headed, with oval faces and aquiline noses; of middle height, not more than 5 feet 6 inches, and the women shorter and not very robust.

The Nordic and Mediterranean types were probably descendants of the later long-headed people of the Old Stone Age, and the Alpine later arrivals from the E.

It is to the Mediterranean stock that we must look for the first of the Neolithic people in this country. It is thought that working along the coast-lands of the W. part of the Mediterranean they struck up through the Carcassone Gap between the Pyrennes and the Cevennes, at 1 (Fig. 64), and thence by way of 2, 3, through the W. of France until they came to Brittany and Normandy, then worked along the coast until they came to where the Straits of Dover now are. Remember this was not done in a day, or many days, but was a movement lasting for hundreds of years.

The later Mediterranean or Iberian people were the builders of the Megalithic monuments; the menhirs, dolmens,

and chambered barrows which culminated in Stonehenge, and spread from India, across to W. Europe and our own land. Megalithic is derived from two Greek words, *megas*, great, and *lithos*, stone, and its most distinctive contribution to the art of building was the evolution of the lintel; in this detail it was allied to Egyptian and Greek building. Stonehenge is the triumph of the lintel, and the general assumption is that it dates from the end of the Neolithic, or the beginning of the Bronze Age.

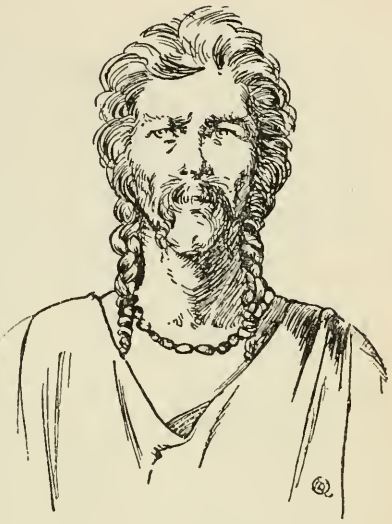


FIG. 9.—The Nordic Man.

These Neolithic dolmen builders retreated before the round-headed Bronze men, who seem to have come from the Eastern Mediterranean, through Gaul to Britain. They were stalwart, dark, broad-headed men, and arrived here about 2000 B.C. It is thought that these earliest round-heads were not Goidels, and we will explain this later. It is quite possible that they may have had something to do with megalithic building, as they associated with the Neolithic long-heads; we know this, because in the round barrows, which are of Bronze Age, round- and long-heads are found buried together. The Bronze men brought with them their flat bronze celts, as Fig. 46, and if at the first they could not manufacture these they did obtain them by trade.

About the same time the "Beaker" people arrived on the N. and E. coasts. They are called "Beaker" because of a pottery drinking-vessel, as (1) Fig. 62, which they used. They did not use bronze, or introduce it. They came from around Kiev on the Dnieper (7, Fig. 64), to the S. of the Pinsk Marshes, and then on the line 8, 9, 10, not in a month or a

year, but gradually, as their numbers increased and they were forced to find new territory—in fact, just as men in recent days have gone to America to make their fortunes. These Beaker men were a mixture of Alpine and Nordic, combining the broad heads of the Alpine with the fair colouring, strength and length of bone of the Nordic. They were tall and strong-browed.

About this time we are able to find out that the conditions of life were becoming easier. The people lived longer lives, they were bigger than in Neolithic times, and there was less difference between the size of men and women.

The Coming of the Celts

At a later day, perhaps, about 700 to 500 B.C., the first of the Goidels, Gaels, or Celts arrived; they were an Aryan-speaking people who burned their dead. Here we might explain what is meant by the Aryan-speaking peoples, because the spread of this language is one of the wonderful things in the world's history, like the Magdalenian painting. The Aryan language is also described as being Indo-European, Indo-Iranian, and Indo-Germanic. Towards the end of the eighteenth century, similarities were noticed in the construction of languages seemingly so different as Sanscrit, Greek, Latin, German, and Celtic, and later all the European languages, except Turkish, Finnic, and one or two others, were added, with some modern Indian languages, to a group which has been derived from this primitive Aryan tongue. This does not mean that all the millions of Aryan-speaking people to-day are descended from Aryan stock; what it does point to is some wonderful idea which spread across Europe like a flame burning dry grass.

The exact spot where the original Aryans lived is still a matter of debate : one idea is that it was in South Russia or Hungary; another, on the Iranian plateau to the S.E. of the Caspian Sea. From there the language spread S.E. across the Indus into India. The route to Europe may have been to the E. of the Caspian Sea, and then W. across the Volga, Don, and Dnieper, to 7 (Fig. 64), whence came the Beaker people. Or N.W. from the Iranian plateau, and S. of the Black Sea into Asia Minor and the Ægean. Now

FIG. 10.—Flint Miners.

language does not spread as a fashion, but because it is the vehicle of thought embodying a dominating idea.

The diffusion of the Aryan language coincided with great changes and migrations of the European peoples. The old Neolithic civilization had carried men forward as a tribe, and in a state which did not offer much opportunity to the individual While the pioneer work was being done, the adventurous men had plenty to occupy them, and then may have become restless as conditions became more settled, and have seized power, not necessarily from a selfish point of view,

FIG. 11.—Deer horn Implement.

but to satisfy wider ambitions and to obtain more movement and colour in life. We come to the Age of Heroes. The chieftain, or patriarch of the tribe, has to give way to the hero, who welds it into a nation and becomes a king. Again it may have been the work of a great prophet with some new message for the souls of men, and this view is borne out by the pregnant fact that man now begins to burn his dead instead of burying them.

These Goidels, the first of the Celtic, Aryan-speaking people to reach our shores, were the forerunners of the Irish, Manx, and Highlanders.

About 450 B.C. the Brythons, or Britons, began to arrive. They were long-headed, and the forerunners of the Welsh, Cornish, and Breton peoples. They were not unlike the later Anglo-Saxons, men of strong build and fair hair, and may have arisen from a mingling of Alpine and Nordic types. They introduced iron into S.E. Britain, and drove the Bronze civilization into the W. and Ireland. Theirs was the Kymric form of the Celtic language.

About 200 B.C. came the Belgæ, of the same extraction as the Brythons, and Cæsar found them in the possession of the S.E. districts.

FLINT IMPLEMENTS

Having now given an outline sketch of the various peoples we shall meet with in this book, we will go back to the first of these, the men of the New Stone Age. We will examine first their implements, and then later consider the work they did with these tools. These Neolithic implements are not necessarily of polished stone, as some people seem to think. Flint was still chipped as in the Old Stone Age: sometimes it was chipped and ground, or polished in parts; sometimes completely so. We can only give a few of the more typical

FIG. 12.—Deer-horn Implement.

implements, and we strongly recommend our readers to pay a visit to the Prehistoric Room of the British Museum, where the endless variety of the implements can be studied in detail. Neolithic implements are found on the surface of the ground or just under it, and are not dug out of gravel as those of the Old Stone Age are.

When our readers pass on to the standard text-books of archæology, they will be meeting constantly such terms as nucleus or core, flake, and bulb of percussion. It may be as well to explain these. Flint is dug out of the chalk in separate blocks or nodules complete in themselves; not cut out of a mass, as in the case of stone and rock. At Cissbury near Worthing, and Grimes' Graves near Brandon in Norfolk, the pits formed by the early miners to obtain their flints have been discovered, and it is thought the implements were roughly finished here for export. They used deer-horn picks, and shoulder-blades as shovels, as Fig. 10. These can be seen in the Prehistoric Room at the British Museum, with horn punches and chisels, as Figs. 11 and 12. The flints have a white skin called the crust, and the old men often left part of this on the implement. Remember they had not any metal hammers, and that a rounded pebble was used instead. The first step was to knock off the top of the nodule, so as to provide a flat table at A, Fig. 13. This tabular surface was held nearly at a right angle, and the flaker with his pebble struck a sharp blow a little back from the edge at the arrows, on the line of the intended fracture. By long practice he knew exactly the position and force of the blow necessary to detach the flake; it is obvious that he might obtain one of triangular section from the left-hand arrow as at B; this

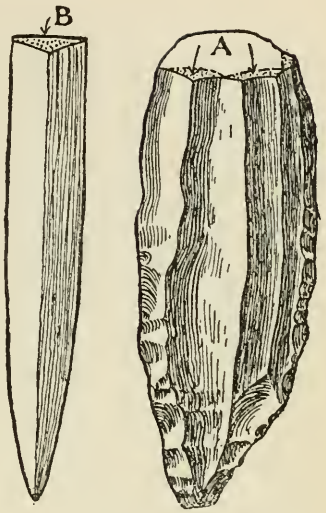


FIG. 13.—Flint Flake and Core.

would have a mid-rib up its centre, and two keen cutting edges, and be useful as a knife or lance-head. From the right-hand arrow he would obtain a flake with two ribs up the middle; it was this type of flake, cut up into short lengths, which was used until recent days for flint-lock guns, and strike-a-lights. It is becoming increasingly difficult, in these mechanical days, to appreciate the manual dexterity of the old workers, who were content to regard the hand as the most wonderful tool of all. Try and make a flint implement yourself, but wear motor goggles to safeguard your eyes, and you will leave off with a new respect for these old handicraftsmen.

The block from which the flakes are struck off is the nucleus or core, and in the Prehistoric Room in Table Case A, you can see one with all the flakes replaced. In the Gallery over are cores from France called, by the peasants who find them, *livres de beurre*, or pounds of butter.

Flint is a curious material, intensely hard, it is yet rather elastic. When it is struck by the hammer-stone, the blow detaches the flake with part of a cone under the point of impact; this is the bulb of percussion, and is generally regarded as a sign of human work on a flint. The implements resolve themselves into two types. First these made from the core itself, the flakes being removed to give the desired shape. Naturally the larger implements, like the hand-axes in Part I., and the celts, axes, and hammers, in this part are shaped cores. In the other type flakes were struck off the core and were used for knives, lance and arrow heads,

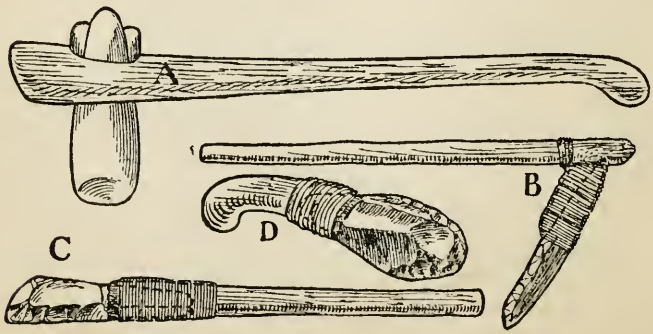


Fig. 14.—Hafting of Flint Implements.

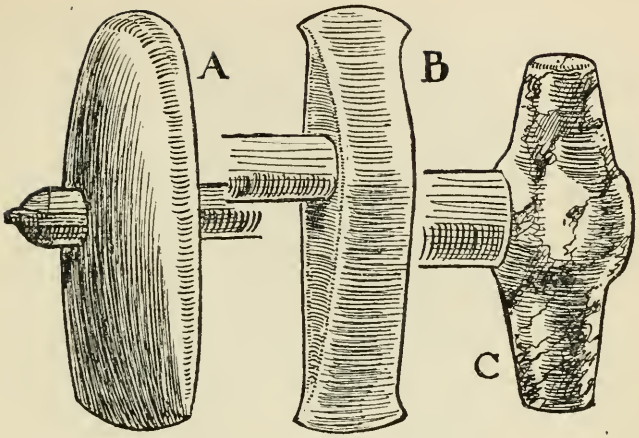


FIG. 15.—Stone Axes and Hammers.

scrapers, borers, and all the little odd tools which would have been so useful.

Fig. 14 shows a few typical implements, and the way they were hafted or had handles fitted. A is the celt, or axe, and is the Neolithic descendant of the hand-axe of the Old Stone Age. Celts have been found varying from an inch or so long up to 15 inches or 16 inches, and were the most important implements of Neolithic man. They were driven into the head of a wooden handle as at A, and then wedged from the top. Sometimes the celt was fixed into a deer-horn socket driven into the wood. With celts trees were cut down and all the rough carpentry done. The stone celt or axe was the forerunner of the bronze celt, and led to the iron axe which has been one of the most useful tools to man throughout the ages. A, Fig. 14, shows a polished stone celt. These at first were chipped out of flint. Then the cutting edge was ground, and finally the whole celt polished. B, Fig. 14, shows a rougher, unpolished type, hafted at right angles to the handle for use as an adze; this would have been used like a hoe to chop towards the foot, and must have been very useful in making dug-out canoes. Rougher stones mounted in this way would have been used as hoes for agriculture. Neolithic man cultivated the terraces or lynchets near their encamp-

ments, as Fig. 2. For this method of hafting any branched stick could be used, and the flint bound on with raw-hide thongs. C, Fig. 14, shows how a chisel-shaped flake could be mounted, and D a scraper. Scrapers were as useful and general in the New, as the Old Stone Age, and probably served to remove the fat from skins and to scrape wood. A very usual shape was that of an oyster-shell ; the Eskimo use these, and mount them in morse—ivory handles, and their flaying knifes are like the thin oval flakes of greenstone found in Scotland, and called Picts' knives. A, Fig. 15, shows a polished stone celt hafted at right angles for use as an adze. B is a stone axe with double edge, and C a stone hammer. In thinking of how these were made we must remember the extraordinary patience of the savage. Lafitau, in *Mœurs des Sauvages Amèricains*, 1724, says that a North American Indian would spend all the leisure of his life in making one stone tomahawk, and we may, or may not, consider that a waste of time.

The Neolithic implement maker used volcanic rocks for his axes, and after roughly trimming these to shape, finished by grinding the axe on a grindstone, not one that turns round, but by rubbing the axe on a stone, as the carpenter sharpens his plane iron. The boring of the hole was done last, with a stick, or hollow bone, and sand and water. Any sand hard enough to scratch the stone would cut the hole in time. The drill could have been turned with a bow, as Fig. 47, Part I. Odysseus drills out the eye of the Cyclops by means of a stake with a leather thong around it, "like a shipwright boring timber."

Some of the stone axes have one edge and a rounded head, and may have been used for splitting wood, by hammering the head with a wooden mallet. Others have a purposely blunted edge, as if for use as battle-axes, with less chance of cutting the wielder, and just as much power to damage the enemy. Amusing traditions have gathered around the old stone celts ; the country people in the past thought they were thunderbolts. Stone hammers were known in Scotland, until the end of the eighteenth century, as Purgatory Hammers, and were supposed to have been buried with the dead, so that they could hammer on the gates of Purgatory, till the heavenly janitor appeared. Another point to be remembered, and one which we have so often emphasized, is

that stone continued to be used after the advent of bronze. Sir William Wilde, writing in the *Catalogue of Stone Antiquities in the Royal Irish Academy Museum*, stated, in the middle of the nineteenth century, that stone hammers and anvils were used by Irish smiths and tinkers, until about that time. Again, Sir John Evans, in *Ancient Stone Implements*, published in 1872, says that up till that time flints were sold in country shops for use with steel to make fire. Leaving the larger implements, we can turn to the lance, javelin, and arrow heads, and the many things which were made out of the flakes. We have seen by Fig. 13 how the flaker went to work. Long flakes up to 8 and 9 inches were possible, and these were used for lance-heads ; shorter ones for javelins and arrows ; thicker and rougher flakes for scrapers. Having obtained the flakes, the maker then proceeded to trim these into the desired shape, by what the archæologists call secondary flaking. Some of this, as in the Danish specimen, in Case 134 in the gallery of the Prehistoric Room at the British Museum, is rippled along the edge of the implement in a most delightful way. Opinions are divided as to how this secondary flaking was done. A flint punch, or fabricator, may have been used ; or the flake held flat, face uppermost on an anvil stone, may have been trimmed by hammering tiny flakes off the edge with a hammer-stone. The Eskimo place the flake over a slight hollow in a log, and then press an ivory tool which spalls off small flakes. Capt. John Smith, writing in 1606 of the Indians of Virginia, said, " His arrow-head he maketh quickly with a little bone, which he ever weareth at his bracert (guard on wrist against bow-string), of any splint of stone or glasse

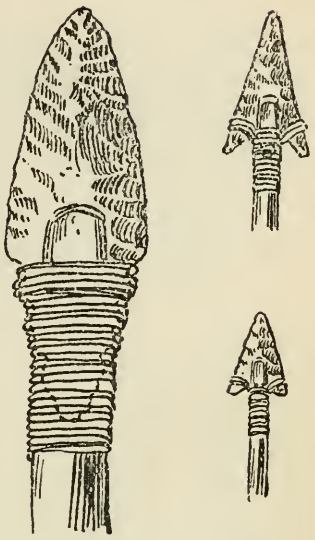


Fig. 16.—Flint Spear and Arrow Heads.

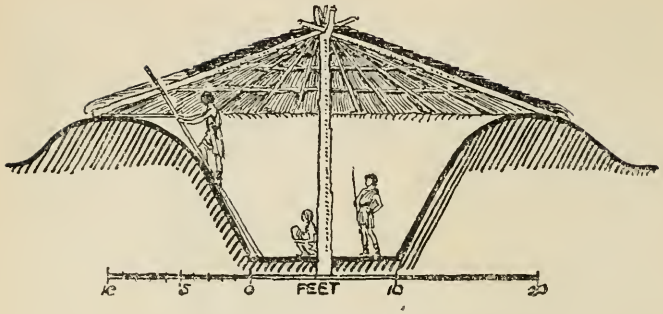


Fig. 17.—Pit Dwelling.

in the form of a heart, and these they glew to the end of their arrowes. With the sinewes of deer and the tops of deer's horns boiled to a jelly, they make a glew which will not dissolve in water." This means a form of mounting as Fig. 16. The arrow-heads must have called for wonderful handling when being made. As with the Celts, tradition has gathered round the arrow-heads, which, until quite recent times, was called elf-darts by the country people, who thought that the fairies used them to injure cattle.

Houses

Having seen something of the tools which Neolithic man possessed, we can pass on to the work he did with these, and will begin with the houses he built. In Fig. 5 very simple huts are shown which resemble those of the Old Stone Age shown in Fig. 59, Part I. It is a type which has always been used by primitive man, and we can remember charcoal burners in Kent who housed themselves in this way. This would be the hut, of what is called the hut circle, that is, the shallow depressions which are found in Hayes Common in Kent, and many other parts of the country. The hole which remains now is dished out like a saucer, because in the time which has passed the outer edges have been trodden down and washed down by the rain. Originally the hole was dug out and the ground heaped up around ; this would have given headroom inside, and have

taken the place of the vertical walls that came later on. A central roof-tree supported the saplings at the top, which, resting on the bank at the foot, formed the roof. A rough thatch completed the whole. Very much deeper pit dwellings were formed, as Fig. 17, in the same way, and these suggest that fear prompted the form of their construction. It is obvious that this type would not have been very noticeable to prowling enemy bands, and the wolf would have hesitated to leap down into such a trap. The pit dwellings are thought to be earlier than the shallower huts, and would only have been possible in a dry soil; this obtained, they would have been warm in winter and cool in summer. The cooking hearths, as on Hayes Common, often took the form of small pits outside the huts. A fire was made in these with large stones in it, and the ashes being raked on one side, the carcase was

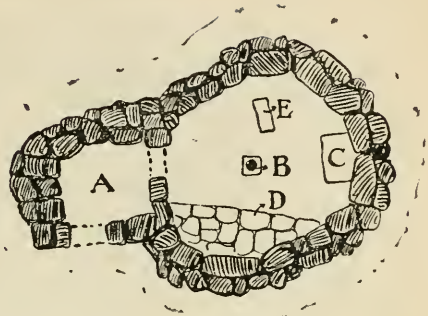


FIG. 18.—Plan of Hut.

FIG. 19.—Neolithic Hut.

placed in the pit and covered over, when the heat of the stones turned the pit into an oven and cooked the meat. It is very probable that the accidental introduction of ore with the fuel into one of these hearths led the way to metal smelting. The floors of the huts would have been covered with bracken, like straw in a stable, and carpet-sweepers were not needed.

Fig. 18 shows the plan, and Fig. 19 the outside of an interesting development from Grimspound, Hambledon, Dartmoor. Here are the remains of twenty-four huts, surrounded by a double wall enclosing about 4 acres ; quite a little village. The roofing of the huts was on the same principle as Fig. 17, but of course all this has long since gone. The plan is interesting because the hut has now developed a porch or outer parlour at A, which must have added to the comfort of the inhabitants ; at night it may have been used as a stable. The house is rising up out of the ground, and has rough vertical walls ; at the entrance the builders selected upright stones for the door jambs, which are covered with a stone lintel ; this is an important detail and links the house up with Stonehenge, as we shall see later. The hut is about 11 feet diameter inside, with an inside hearth for the fire at C, and a cooking-hole at E ; there is a raised dais at D paved with flat stones, about 8 inches higher than the general floor. Here the family could sit on bracken and fur rugs in great comfort. The central roof-tree, supported on a stone at B, would have been used, like the pole in an army bell-tent, to hang things on. As late as Cæsar's time the Gauls squatted in straw around a low table, and tore their food like animals, using their fingers and only occasionally their knives.

Fig. 20.—Strike-a-light.

Flint thumb-scrapers found in the Dartmoor huts suggest skin clothing ; though weaving appears to have been started in the Swiss lake

FIG. 21.—Flint Sickle.

dwellings in Neolithic times, it is doubtful if it started here till the Bronze Age. Very few ornaments have been found in long barrows.

Skin clothing does not necessarily mean that Neolithic men only wore the rough pelts of animals ; we have seen in Pt. I. how the women of the Old Stone Age could make very good bone needles, and a visit to the Ethnographical Gallery, at the British Museum, will show us what beautiful skin garments the Eskimo can make. Neolithic garments may not have been quite as well made as these, and in Fig. 56 we have shown the man and woman of this period, on the left of the drawing. in a simpler type of clothing. The Picts, who were descendants of the Neolithic men, tattooed themselves, so this method of decoration may have gone back to the New Stone Age.

FIG. 22.—Grinding Corn.

Fig. 20 shows a way that the Neolithic woman had of making fire ; a piece of flint was used, in conjunction with a lump of iron pyrites, as a strike-a-light. Pyrites is found in the lower chalk beds, and may first have been used as a hammer-stone on flint, when the resulting sparks would have suggested its use as Fig. 20. The sparks falling on dry moss could be blown into flame. Very beautiful flint knives, as Fig. 21, have been found, and it is thought that these were used as sickles. The reaper would have gathered the ears of the corn in one hand, and cut these off as shown. We have already referred to the lynchets found on the Downs which are supposed to have been cultivation terraces. When the corn was cut the threshing would have been a very simple business, and then came the grinding into flour. Fig. 22 shows a saddle-back quern : the grain was placed on this, in the hollow made by use, and the upper stone pushed to and fro until the corn became flour. Neolithic man would hardly have been able to obtain yeast, and probably his bread was unleavened, or the flour mixed with honey and baked into biscuits. Fig. 23 shows a pot quern, like a modern pestle and mortar, which would have been very useful for pounding things up. These querns were made of gritstone, and can be seen at the British Museum in Wall Case 5 in the Prehistoric Room.

Pottery.

Fig. 23.—Pounding Grain.

We come now to one of the most important discoveries of Neolithic man or woman ; he or she found out the way to make pottery. Fig. 24 shows a bowl of thick dark ware made without the potter's wheel, probably in the same way that the Akikúyu of British East Africa work to-day. These people temper their clay by pulling it into small pieces and freeing it from stones ; it is then dried in the sun, and after mixed with water until it is plastic. A fine sand is then kneaded into it, in the proportion of about half in half, and the clay finished in long rolls. One or two of these are formed into a collar shape, and with one hand inside this, and the other out, it is gradually modelled into the shape of the top half of the pot, more clay being added in rolls as the work proceeds. The half pot is allowed to dry in the sun for some hours, except the lower edge where the join has to come ; this is protected by leaves. This edge has rested on leaves while the top half was being made, so that it could be turned more easily, and this movement must have suggested the potter's wheel later on. In the next stage this top half is turned upside down on its already finished mouth, on more leaves, and

Fig. 24.—Neolithic Pot.

Fig. 25.—Making Pottery.

the modelling proceeds as before, more material being added as required to form the bottom, the shape being given by one hand in, and the other out, until there is only room for one finger, and then the hole is closed, and the pot finished. Again, a few hours are allowed for hardening, then the pots are placed mouth downwards on the ground, and a bonfire of brushwood made all around them; when this has burned out, and the pots are cool, they are ready for use. The only tool used, beside the hand, is a piece of gourd-shell.

Fig. 25 shows how Neolithic woman went to work, and Fig. 26 a pottery spoon she made, which can be seen at the British Museum.

Woman as an Inventor

The Akikúyu pottery is made by women, and the probability is that Neolithic woman did this work, and looked after the home, while her husband was hunter and herdsman. She probably did far more than just cook and mend; we must think of her as an inventor. With pottery the long train was started which has led up to the modern saucepan; before then, meat could only be roasted over a fire, or baked in a cooking-pit, but with a stout earthen pot that could be placed in the ashes the Neolithic equivalent of Irish stew was possible. Water could be heated, and milk and grain stored.

It will be noticed that the pot shown in Fig. 24 has a rounded bottom, which suggests that it might have been

blocked up on two or three stones, and a fire made under it.

FIG. 26.—Pottery Spoon.

Perhaps it was the woman who noticed that cattle ate the seeds of grasses, and experimented by grinding some between stones; she may have tasted the flour and found it sweet, and then have brought home more seeds. A few seeds may have blown away into the ground newly turned up at the base of a hut, and the woman may have watched these growing and have watered and tended them. In this way it may have occurred to her to make a garden, and she would have discovered that cultivation improved the crop; once this fact was appreciated there were endless opportunities; the crab apple, wild plum, and other fruits could be experimented with, and most probably woman was a gardener before man became a farmer; of one thing we may be quite sure, Neolithic man did not rise up one day and plant an acre lynchet, without endless experiments and questionings going before.

If Neolithic woman made pottery, then it is to her we must give the credit for a renaissance of the Arts. There had been a great slump in the art world since the Magdalenian times of the Old Stone Age, but with the coming of pottery, pattern began. At first it did not amount to much more than cutting lines in the damp clay, or denting it with the finger nail; still it was a start, and before this book ends we shall see how in late Celtic times pattern became very beautiful.

NEOLITHIC EARTHWORKS

Having seen something of men's houses in Neolithic times, and the more domestic details of their lives, we can turn to their larger works. The trackways, or road system shown on Fig. 3, link up a series of splendid earthworks, and many of these are of Neolithic construction. Starting perhaps as simple cattle enclosures, surrounded by a ditch and bank, with some additional precautions taken at the entrances, these camps were gradually improved, until we arrive at such

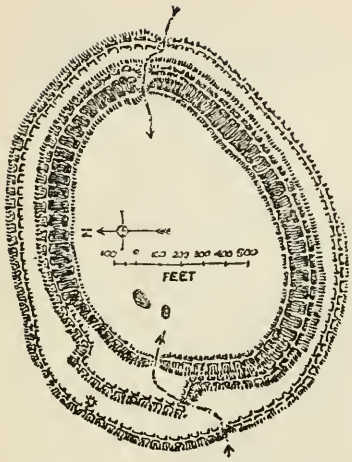


FIG. 27.—Plan of Badbury Rings, Wimborne, Dorset.

a masterpiece as Maiden Castle near Dorchester. More banks were added, the entrances made into mazes of ingenuity; the camps divided into two parts, one for cattle and the other for people; developed just in the same way as the Tower of London, where we find the Norman keep surrounded by much later works.

It is very difficult to estimate the age of earthworks; especially the very simple ones. Neolithic flint implements and pottery have dated some; in others Roman coins have been found, but this would not justify us in saying that an earthwork was Roman. The Romans fortified their camps when on the march, but did not of course ever live in hill forts. Roman coins in these may point to the times of the Saxon terror, when the Britons fled to these forts as places of refuge and took their money with them.

Earthworks are classified by archæologists as A, Promontory Fortresses, where a piece of high ground inaccessible by reason of precipices or water on one side, has been defended by artificial works on the other. B 1 are Hilltop Forts with artificial defences following the natural lines of the hill, and are sometimes called Contour forts. B 2 are Forts on high ground, less dependent on natural slopes for protection, and there are later types which do not concern us now.

To illustrate the general principles of this method of fortification by earthwork we have chosen Badbury Rings, near Wimborne, Dorset, which is classified under B 1, and the plan of this is shown on Fig. 27. It may be as well to give first a brief description of the terms used in describing an earthwork. Vallum, Rampart, and Agger, all mean earthen walls, see 1 on section on Fig. 28. Fosse or Ditch at 2,

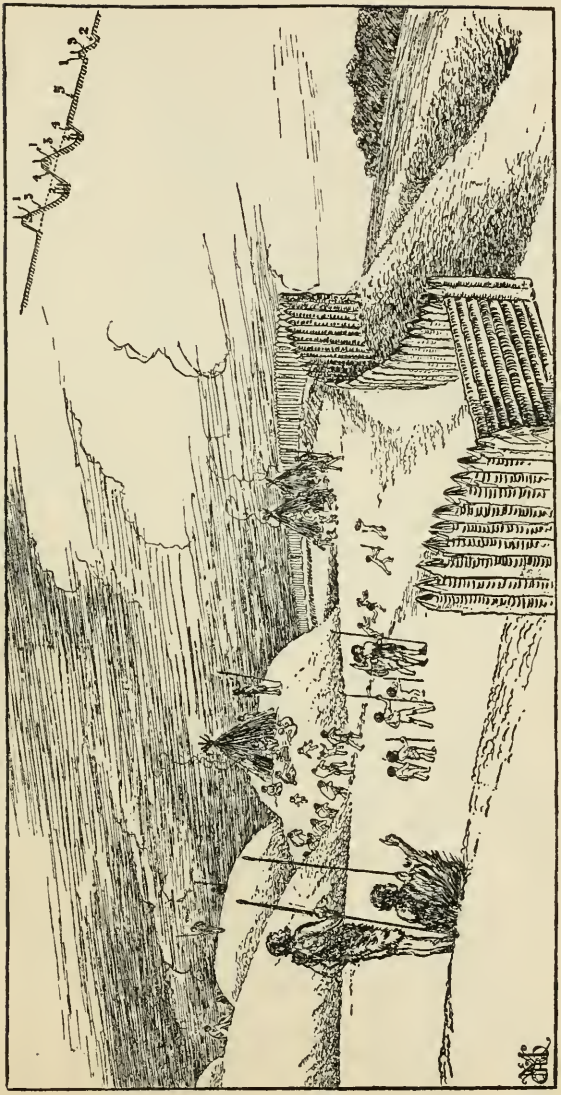


Fig. 28.—The Eastern Gate at Badbury Rings.

Escarpment is the slope at 3. Counterscarp at 4; if the counterscarp is brought up above the level line as a smaller rampart, this is a revetment. The flat piece of undisturbed ground at 5 is a Berm. The plans of earthworks, which generally look like hairy caterpillars biting their tails, show the top of a slope as a thick line tapering off down the slope.

Now as to the way the old builders went to work. To start with, they had as good an eye for the possibilities of a piece of country as a Royal Engineer officer, or a fox-hunting squire. They always chose pleasant sunny situations where the thyme-scented grass gave good feeding for their cattle, and the scabious flowers nodded in the breeze to the song of the skylark. There is no more pleasant place in which to loaf than an old earthwork; you can always get into the sun and out of the wind, and the slope of the banks is exactly right for an easy position from which to gaze over the country-side, and that is just what the old men wanted to do. Their cattle would have grazed on the hillside, meanwhile the watchman kept a look out for wolves and wild boar, or wandering cattle-lifters. Cattle was wealth in these days.

The builders then chose the rounded hump of a chalk down, which was not controlled by any higher ground, and it is probable that the first thing they did was to dig one simple ditch and bank, or fosse and vallum. In doing this they had to use antler picks, and shoulder-blade shovels, as Fig. 10; remember they had no metal as yet. They doubtless carried up the chalk in rough baskets, and so raised the bank above them. On examining an old earthwork, the first thing to do is to discover the natural level, as dotted line on section on Fig. 28, and then see how they went to work, because at first sight the fosses are so deep, and the banks so high, that it seems impossible such work could have been done without steam navvies. When we have found the natural level, we discover that the art of the job was, that by the basket of earth dug out, not only was the ditch lowered, but the bank raised; see A, Fig. 29, and that a higher bank was made more speedily on a slope as at B, than on the level. Again, on a very steep slope as C, the soil dug out could be thrown downhill.

Still, notwithstanding all this, these earthworks must have been tremendous undertakings. The outermost of the three banks at Badbury, which we illustrate, is 1 mile in circuit;

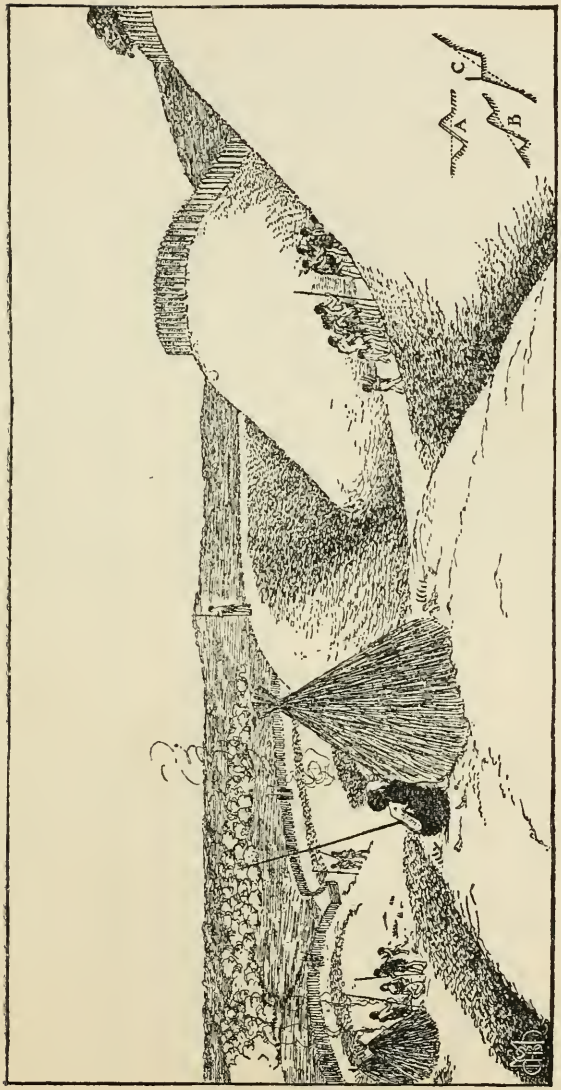


Fig. 29.—The Banks at Badbury Rings.

at Maiden Castle, near Dorchester, nearly 1½. Particular care was given to the design of the entrances. At Badbury there are two, one on the E. and the other the W.; the dotted line shows the way in. On the W. side the banks have been cut through in other places in recent times, but in old days any invading force had to come as the dotted line, which left them very much at the mercy of the bowmen on the banks above them. Our drawings (Figs. 28 and 29) show the eastern entrance, and how this was controlled. A "flanking" entrance was so arranged that the right side (unprotected by shield) was exposed to the defenders' arrows. The tops of the banks were palisaded, and the bottoms of the ditches filled with sharpened stakes. These palisades led the way to the hedges of Saxon times, because the wood of which they were made being green, must have sprouted, and given men the idea of a hedge. The wide areas between the banks, called "bermes," may have been used as cattle pens, because a stampede of half-wild cattle at night would not have been pleasant; or, as at Maiden Castle, the camp may have been divided into two parts for the same purpose.

Hut circles are found in the earthworks, which suggest huts as shown in our drawings. Heaps of sling stones have been found, and bracers, or wrist-guards, which show that bows were used.

Water Supply

There has been considerable discussion as to how the Hill Fort men provided themselves with water, and there are various theories. First, it must be remembered that the fort formed the citadel, and place of refuge for the district, and the people grouped themselves around it. Their little huts were not difficult to make, and their simple husbandry meant only the cultivation of the terraces, or lynchets, on the hillside where they grew their corn; they did not need or use so much water as we do to-day, and in the usual way were free to go downhill to the nearest stream. The country was not drained in those days, which meant water lay on a higher level than now, but leaving springs on one side, there is the dew pond which is still used to water cattle on the Wiltshire Downs. This is made as Fig. 30. A shallow saucer-like depression is cut in the chalk, and lined with straw. On

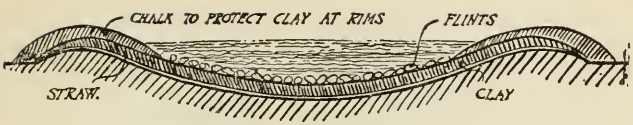


FIG. 30.—A Dew Pond.

this comes a layer of puddled clay, with rims of chalk to protect the clay from the feet of cattle. Loose flints are put on the bottom, and the pond is started with a little water in it. The straw and clay cut off the heat of the earth, and when the moist mists drive over the Downs at night and come to the cooler pond, they condense on its surface. Ordinary ponds are formed in this way, where a pocket of clay comes in a warmer soil. Water drains into it, and the cattle puddle up the clay till it is free from cracks and watertight, and so the pond extends.

In the hot summer of 1921 we were going through Dorset looking at earthworks, and found the pond on the top of Holt Heath, near Bull Barrow, full of water, while the Tarrant river in the valley close by was absolutely dry. The Wycombe chairmakers, who go into the woods to turn chair legs, obtain water in an ingenious way. If you examine the bole of a beech tree, you will find well-marked channels, where the rain and condensed dew runs down the tree-trunk. The chairmaker makes a cross cut in such a channel, and drives a chip of wood in which diverts the water into a pail; so turning on a tap is not the only way to get water.

LIFE IN THE WILD

We think other questions may have occurred to boys and girls who have visited a hill fort; they may have asked themselves, how early man could have withstood the cold and rain in such an exposed position, with only very scanty clothing. The Great War was a revelation as to the amount of hardship modern man could withstand, and yet remain healthy, but a happier example was given by a Mr. Knowles in 1913. Mr. Knowles is an American; born in the backwoods, he ran away to sea as a boy; later he was a trapper and guide, and now is an artist. Without knowing anything about primitive man, Mr. Knowles wondered whether it would be possible for a modern man to go into the wilds and

support life without any outside aid ; to depend entirely on one's own effort. He determined to try, and on 4th August 1913 walked out alone into the woods of Northern Maine, naked, without any weapons, tools, knives, or matches. His book *Alone in the Wilderness* tells us how he fared. Fire was made with a fire-drill, as Fig. 47, Part I. ; and the inner bark of cedar braided into thin rope used for the bowstring, until later, when game had been killed, sinews were available. A log too heavy to move, was cut into short lengths by lighting fires at the places where it was to be divided ; sticks were pointed by burning the ends and then scraping away the char. A maple had fallen on to a hornbeam and smashed it up, and this provided the slivers of wood which could be scraped down with a " sharp rock " into the bow and arrows. Food was toasted over a fire, or on rocks heated by fire, and the fire banked down lasted for days. Mr. Knowles found it quite possible to walk about naked by day, but needed leg coverings as a protection against briars, and a rug for the night ; in this he was like the Australians and Tasmanians (p. 35, Part I.). The rug was obtained by trapping a bear in a combined pit and deadfall trap. Pointed stones and digging sticks, as Fig. 62, Part I., were used to dig the pit, and the bear when caught, killed by a blow on the nose from a hornbeam club. We may be quite sure that prehistoric man used all sorts of traps and snares in this way. Mr. Knowles used sharp stones for the skinning, and " quantities of meat came off with the skin " ; this gives us a clue as to why prehistoric man used so many scrapers. Some of the bears' meat was smoked for keeping, and all the sinews kept for ties. There were blueberries and raspberries for the picking ; various buds and barks were chewed, and frogs eaten, but not liked. Trout were caught by breaking down a beaver dam, which lowered the stream above, and left the fish stranded in pools. Animals were surprised in the act of killing, and driven off their prey ; an otter who had killed a trout ; a bear, a deer. Mr. Knowles did not suffer from the lack of salt, except that his food was not so palatable. For huts rough shelters were made, like Fig. 37, Part I., and mocassins were made of the inner lining of cedar bark, until skins could be obtained. Bowls, in which water could be heated, were made of birch bark skewered into shape, and these do not burn below the water-line. Mr. Knowles' book is illustrated by drawings made with char-

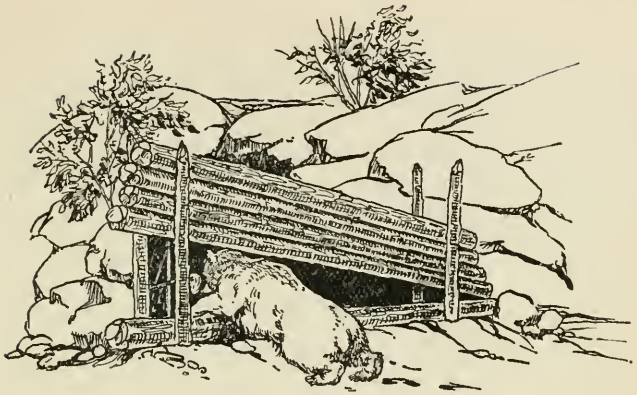


FIG. 31.—A Deadfall Trap.

coal from his fires on birch bark ; he actually contemplated painting, and started making paper and brushes.

He passed his forty-fourth birthday in the woods, and was examined by Dr. Dudley A. Sargent, the physical director of Harvard University, both before and after his experiment. According to the system employed at Harvard, his physical condition equalled 876 points before, and 954 after. If a twentieth-century man could do all this, we do not think there is any need to be sorry for prehistoric man in his hilltop fort ; the sun and rain would not have worried him, and he probably thought of himself as being tremendously up to date. Mr. Knowles feared the cold, but found that the real trial was the isolation from his fellow-men. This seems to us a very just conclusion, and has been proved over and over again. Where an individual, or race, is cut off, then development is arrested ; however, in this book we are concerned with communities which are continually increasing in size.

SOCIAL LIFE

The concentration of a number of people either making or living in a hill fort was to have great results. In the old days, the hunting tribe was like a large family, who very speedily knew all one another's good points, and were so apt to emphasize the bad ones ; life was not at all exciting. The keeping of

cattle brought more people together, and the simple enclosures developed into places like Maiden Castle. Here there must have been a bustling life, with all sorts of men coming and going, and new things to be discovered. Think of the excitement caused by a trader from overseas, arriving at Weymouth, and trudging over the hills to Maiden Castle, and bringing the first bronze celt; the hubbub that would have arisen among a people who had never seen metal before. Customs would arise, and Law solidify out of these. Language would develop around the hut fires, and traditional tales form the beginnings of literature. These hill forts are evidences of a more ordered system of life than anything which had gone before; even to-day with all our transport system, and organized labour, the construction of either Badbury or Maiden Castle would call for concentrated effort. To make a flint implement, which you do yourself, is one thing; to construct a camp which needs the labour of many men is quite another. It had to be planned; there must have been some few men who were skilled in the design of camps, and could say to the tribesmen, "To-day we will cut this ditch, and dump the stuff here to form a bank. You are going wrong there; and you have not allowed sufficient room for that escarpment, because the angle of repose at which chalk will come to rest is flatter than that," and so on.

Whether they were made by slave, or free, cannot now be ascertained, but probably by freemen. The beginnings of slavery are to be found in war, and it is doubtful if the tribesmen were sufficiently organized as yet to combine for warfare; the forts would have had to withstand raids, not endure sieges. Combination for the arts of peace would have led in the end to the application of the same principles to war; then, again, prehistoric man would at first have massacred his captives, until it occurred to him as being wasteful, when they would have been enslaved instead.

If our readers will read Mr. Hippisley Cox's book, *The Green Roads of England*, they will find how these hill forts are all linked up on a trackway system, as well adapted to the needs of the time as the Roman roads and stations later on. This road question brings up fortification, and what it means. Let us imagine Badbury, not grass grown as it is to-day where with a tea-tray we can toboggan, but all shining white where the chalk banks had been thrown up; or Maiden Castle, $1\frac{1}{2}$ miles round its outer circuit. It would have been startlingly

formidable in appearance. As the later tribes came in as immigrants, and found their way along the trackways, these hill forts were there to bar their way. Of course, there were not any invading armies in those days, who needed to maintain lines of communication with the coast; it was a case of invading tribes who wished to settle down. In the case of hostile tribes, they certainly could not afford to cross a trackway and leave a hill fort on their flank or rear, unless they came to terms with its inhabitants. In this way these hill forts played exactly the same part as the Norman Castles and walled towns of the Middle Ages.

Long Barrows

We can now pass on to the Neolithic Long Barrow, or Burial mound, because, apart from its spiritual significance which we will discuss later, it has great interest in its structure. The Long Barrow derives its name from the fact that it is egg-shaped on plan, and there are two types; those having chambers inside for the interment, and others where the bodies were covered directly by the earth; these latter have a ditch at the sides leaving a wide path at the original level at each end. Generally placed E. and W., the burial is usually in the E. end, which is higher and broader than the W. It is a curious fact that the Neolithic long-head built a long

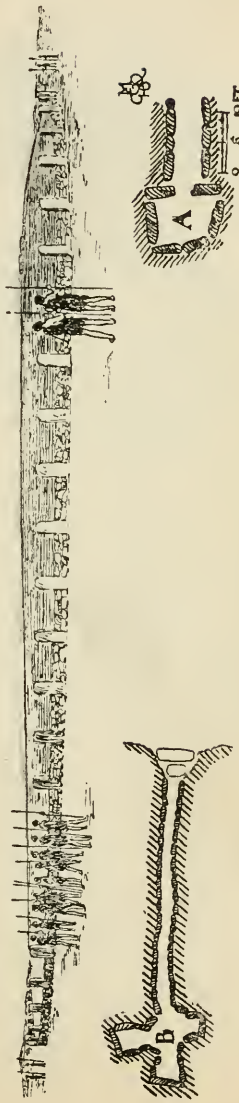
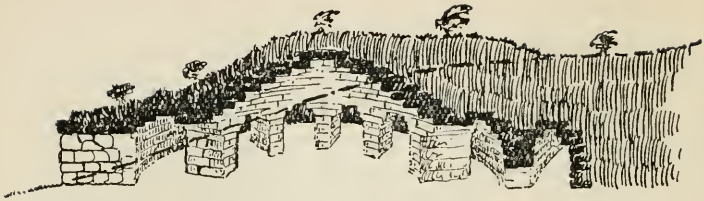


Fig. 32.—Neolithic Long Barrow.



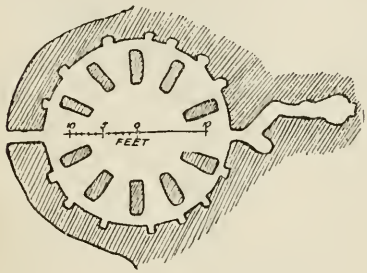


FIG. 33.—Earth House, Usinish, South Uist, Hebrides.

barrow, while that of the later round-headed Bronze man was round.

Fig. 32 shows the West Kennet long barrow. Originally it was about 336 feet long by 75 feet wide at the E. end, where it was some 8 feet high. The small figures at each end are in scale with the length, and serve to give an indication of its size. The sepulchral chamber, as the plan at A, was about 60 feet from the E. end, with an entrance corridor from the outside. It is the construction of this chamber and corridor, with large stones, which makes it a megalithic structure, and so links it up with Stonehenge. The building principle is the same, large stones are placed on edge, and the covering formed by others laid flat as lintels. In other structures of this sort, where the span was too great for one stone, courses of masonry were projected from either side as corbels, until the central space was narrow enough to be bridged. See Picts Houses, Figs. 33 and 34. Around the outside of the W. Kennet barrow came a dry stone wall with upright sarsen stones at intervals. This dry stone walling was a great accomplishment on the part of the builders, and marked an advance. Long-headed skeletons were found in the chamber, and no evidence of cremation. The plan at B is of the Corridor Tomb at New Grange, in Drogheda, Ireland. Externally it consists of a huge heap of stones, 300 feet in diameter and 70 feet high. Internally the corridor is some 60 feet long, and leads to the central chamber, which is roughly domed over at a height of 20 feet. Off this central chamber are

recesses, used for sepulchral purposes. These chambered barrows are planned much on the same lines as the Stone Age Temples of Malta. Sometimes the bones found in the Long Barrows are disjointed, as if they had been placed there some while after death; and it may well be that only the heroes were thought worthy of such burial. Because the barrows were used for more than one burial, it has been suggested that slaves may have been sacrificed to accompany their tribal chiefs to the spirit world, in the same way that implements and pottery were broken, and animals slaughtered, but it is doubtful if slavery was yet possible. We shall probably be quite safe if we regard these barrows as tribal mausoleums, where the people could assemble and hold services. They are a visible sign to us that Neolithic man believed in a life hereafter, and built them as an emphatic assertion that death is not final. It must have needed some great impulse to bring the tribe together, and make them willing to undertake such a vast work as the construction of a barrow.

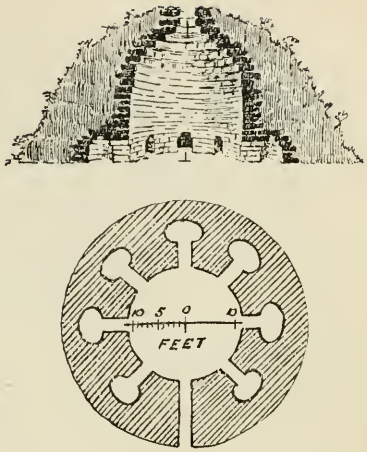


FIG. 34.—Picts House, Sutherland.

This provision of houses for the dead throws an interesting sidelight on the belief of those days; it suggests that in Neolithic times the spirit was tied to the earth for some little while, whereas in the later Bronze Age burials, when the body was burned, it seems as if the spirit was freed at once to go to the spirit-world. The homes for the dead may have been modelled on those of living men; there is a range of habitations which would appear to have been developments of this idea. Figs. 33 and 34 show what are known as Picts Houses in Scotland, and this form of stone construction covered with earth is clearly derived from the chambered barrows. Again, the Eskimo houses (Figs. 35 and 36) seem

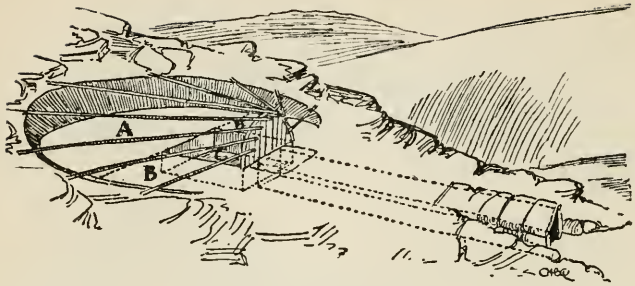


FIG. 35.—Eskimo Rock Hut.

to be survivals carried to the N. In Fig. 35 there is a long tunnel entrance leading to the hut, with the beds at A, and the cooking-places at B. The roof of hut is formed of skins, with a layer of moss between, carried on the poles shown in the sketch. The window is of membrane stretched between whales' jaw bones. The snow house (Fig. 36) is of the same form. There are Picts houses in Scotland which consist of a paved trench lined with masonry, and covered with stone slabs which terminate in a round chamber.

Fig. 37 is of a Picts Tower, Doon, or Broch, found in Sutherland, Caithness, Orkneys, Shetlands, and the Hebrides. The little door shown is only 3 feet 8 inches high, by 3 feet broad, and leads through the wall, which is 10 feet 6 inches thick, with a guard cell off the passage 4 feet high and 9 feet long, with a doorway 2 feet square. There is a circular

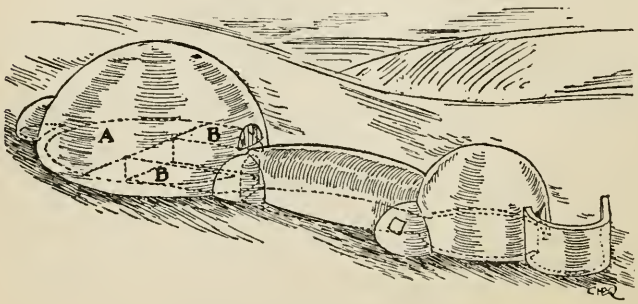


FIG. 36.—Eskimo Snow House.

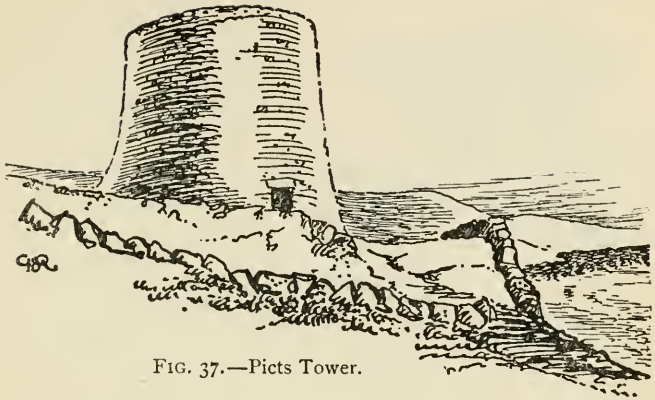


FIG. 37.—Picts Tower.

court inside, open to the sky, and in the wall of this, opposite the entrance, another door leads to a passage winding up in the thickness of the wall to upper galleries, all of which are very low, and lighted by windows into the inner court. It is very difficult to date such buildings, but these Picts towers are Megalithic in character, and built of dry stone ; in design they are first cousins to the Nuraghi of Sardinia, which are fortified dwellings. The Picts are supposed to have descended from the Iberian stock, and, it may well be, built these towers, perhaps as late as Roman times, in this distant part of the country.

Fig. 38 shows a Dolmen, or Table Stone ; this may have been part of the chamber of a barrow, from which the encircling earth has been removed, and ploughed away. Its construction is as described on page 38.

Fig. 39 is of a Menhir, or Standing Stone ; these may have been connected with worship, or be the memorials to brave men, or great events. In Genesis xxxii., we read that Jacob and Laban made a covenant, and so " Jacob took a stone, and set it up for a pillar," and in Genesis xxxvi., that " Jacob set up a pillar on her grave : that is the pillar of Rachel's grave unto this day." A Cromlech is a circle of menhirs ; an alignment where they are arranged in open lines. A Trilithon, two menhirs with a lintel across the top.

We have said that megalithic means building with large stones, and it is well to realize how large some of these were.

FIG. 38.—A Dolmen.

Mr. Peet, in *Rough Stone Monuments*, writes of a block weighing nearly 40 tons, which must have been brought 18 miles, at La Perotte, Charente, France.

It may be as well before we pass on to Stonehenge, the greatest of our megalithic monuments, to get some idea of how the builders went to work. It is probable that the only mechanical aid they had was the lever. Boys and girls, who learn mechanics, will not need to be reminded of what the lever means, so they must excuse this digression for some others who may not know.

Fig. 40 shows a see-saw, and the principles of leverage may have been discovered by Neolithic, or perhaps Palæolithic, boys and girls amusing themselves in this way. A see-saw is like a pair of scales; it does not make any difference if you sit on the beam, or are suspended below it. If the two boys sit at an equal distance from the centre, and are of the same weight, they will balance one another, but if one is heavier, he will have to come nearer the centre, if equilibrium is to be maintained. So much is this the case,

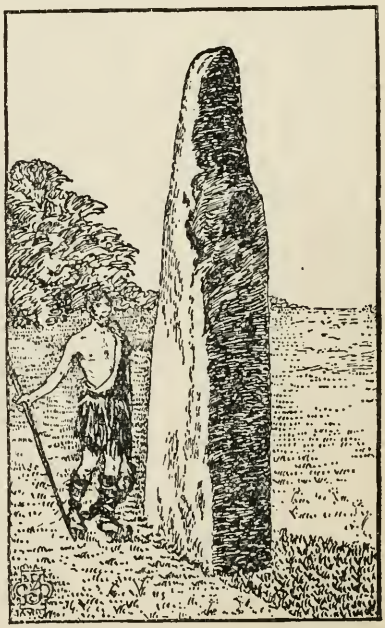


FIG. 39.—A Menhir.

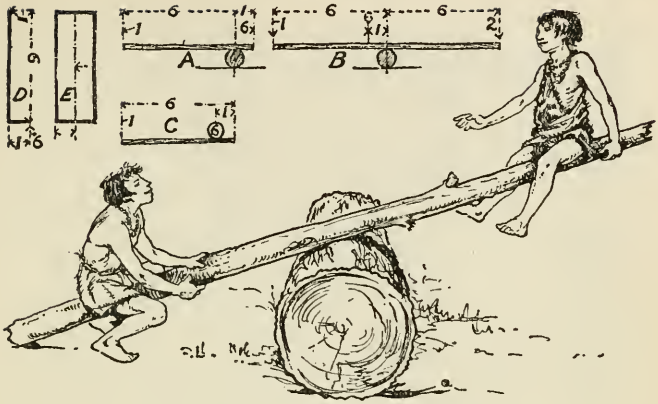


FIG. 40.—The Laws of Leverage.

that if he is very much heavier, say 6 stone, to his small brother, 1 stone, then the heavy boy need only be 1 foot from the centre, to balance the light boy at 6 feet, as A, Fig. 40. Imagine the beam at A as a lever ; 1 cwt. applied in a downward direction at one end, 6 feet away from the centre, will exert an upward pressure of 6 cwt. at the other end, 1 foot away from the centre.

If the boys sit, both on one side, as at B, they will be balanced by a 2-stone boy 6 feet away on the other side. If we take the left-hand side of B, and find that 6 stone at 1 foot = 1 stone at 6 feet, and apply it as at C, and imagine the 6 stone at 1 foot as a log or stone which has to be lifted, then 1 stone lift 6 feet away will do it. We can apply our lever in a different way as at D. The beam is bent at right angles ; one arm is 6 feet long, and the short one 1 foot. A 1 stone push at the top of the 6 feet long arm will produce a 6 stone pull up at the end of the horizontal arm, 1 foot long. This brings us to the erection of church steeples, chimney shafts, and towers. Take E, 6 units high, by 2 broad in its base, as a tower which has to resist the pressure of wind by its weight. Wind pressures are known, and their force on the whole area is applied to a lever arm of half the height of the tower as at E. To oppose this there is weight, acting through its centre of gravity, on a lever arm of half the width of the base. If the wind pressure is greater than the weight, over goes the tower. We

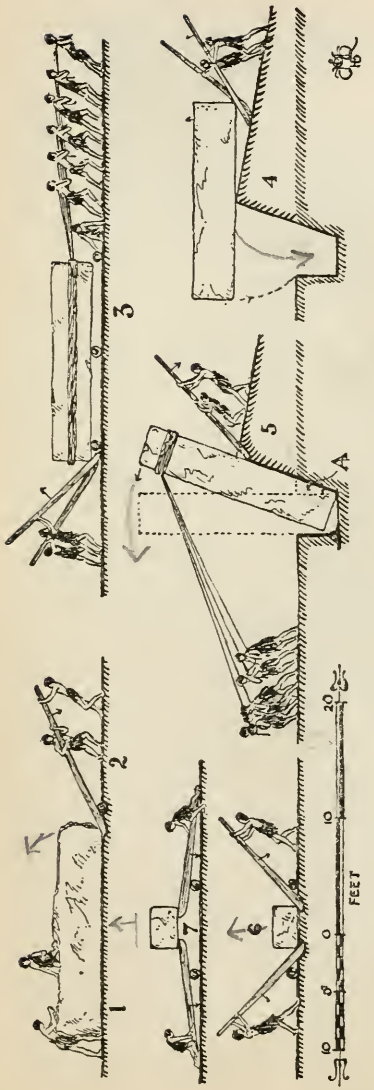


Fig. 41.—Megalithic Builders at Work.

do not say that primitive man looked at problems in this way, but we do, because of the mechanical laws these early builders discovered.

Building Stonehenge

Bearing these laws in mind, we can pass on to a consideration of how the builders went to work. Nature provided a local sandstone, but the inner circle was constructed of strange stones. The nearest place from which these could have been obtained is the W. of Pembrokeshire, and it may be that the stones were already a sacred circle before being moved. No. 1, Fig. 41, shows the masons dressing the stone into shape in its original position to save weight in transport. It is thought that the masons may have used fire first to heat the stone, and then water to make fragments split off, but it would be a dangerous method, and they may have used wooden wedges instead. We have seen a good mason in Inverness-shire working on a large granite boulder on the hillside

where it was dropped out of the bottom of a glacier ages ago. The mason wanted to make a 6-inch landing, and he obtained this by drilling a series of holes, into which he inserted wedges, and so split the landing out of the heart of the boulder. Neolithic man may have used the same methods, but of this we cannot be sure; we do know that he had flint and stone tools, because these have been found when excavating to raise the fallen stones at Stonehenge. The flint axes were roughly sharpened, and held in the hand, and appear to have been used to clean the surface of the stone, after it had been bruised by larger stone boulders, or mauls, which smashed off the bumps.

No. 2, Fig. 41, shows men lifting one end of the block to place rollers under it. No. 3 shows the rollers in position, and men pulling rough hide ropes, with others behind assisting with levers. At 4 we arrive at the building place, where a hole was dug, having one sloping side, and the upright stone being set in the hole, it was fixed by ramming small stones into the triangular space at A 5, but it seems obvious that a sloping embankment as at 4 must have been built up before the stone could be tipped into the hole. Without the embankment it would have been nearly impossible to raise the stone, and a very dangerous job. With the embankment, even if the stone slipped forward a little in the tipping over, it could easily have been levered back into the hole, and then when resting against the embankment as at 5, pulling and levering would have raised it; meanwhile earth shovelled down into the triangular space at A would have fixed the stone in the desired position. As to the top lintel stones, these may have been placed in position by making a bigger embankment, or by levers as 6 and 7. The stone raised once could be blocked up, and the operation repeated. The stone shown in Fig. 41 is about the size of one of the uprights in the outer circle of Stonehenge. Fig. 42 is a sketch plan showing the original form of Stonehenge. First there is an outer rampart, not shown on the plan, consisting of a circular ditch and bank, about 300 feet in diameter. There is an opening on the N.E. in the circle, where it is joined by an avenue. Within this rampart comes the actual temple as shown on plan. First there is the outer circle, at A, which originally consisted of 30 stones, standing about 14 feet high by 7 feet wide by 3½ feet thick. Around on top of these stones comes the circle of

FIG. 42.—Plan of Stonehenge.

crowning lintels, mortised or hollowed out on their undersides on to tenons or stubs worked on the tops of the vertical stones under. Fig. 43 gives some idea of what this outer circle must have looked like when complete. Within this circle is another, at B, of smaller stones, and then at C came 5 magnificent trilithons arranged in horseshoe form on plan. Each trilithon consisted of two upright stones and one lintel, and starting from the N.E., or entrance side, the height of the trilithons is increased. Inside the trilithons is another horseshoe of smaller obelisks at D, around the flat Altar stone at E.

Just inside the entrance from the avenue is a large flat stone, which has the sombre name of the "slaughtering" stone, and a little way down the avenue another upright one called the Hele Stone.

There have been many interesting speculations as to the purpose and age of Stonehenge. It will be noticed that it is set out on an axial line which points to the N.E., or where the sun comes up over the horizon on the longest day, or summer *solstice* of 21st June, but it does not appear to do so now on the exact centre line of the entrance avenue, so far as it is possible to determine this. Taking this difference into account, and the astronomical fact that the sun rises each year a little more to the East, Sir Norman Lockyer and Prof. Penrose formed the idea that about four thousand years ago the sun did rise on the actual axial line of the avenue. We have tried to show this in Fig. 44, and have shown the Hele Stone as part of a trilithon. This estimate of age agrees with the archæological evidence, because in the excavations carried out for raising the fallen stones, only flint implements were found, and not any bronze tools which would point to a later date. There is a model in the Prehistoric Room at the British Museum of Sir Norman Lockyer's theory.

As to its uses, it may well be that Stonehenge was a Temple

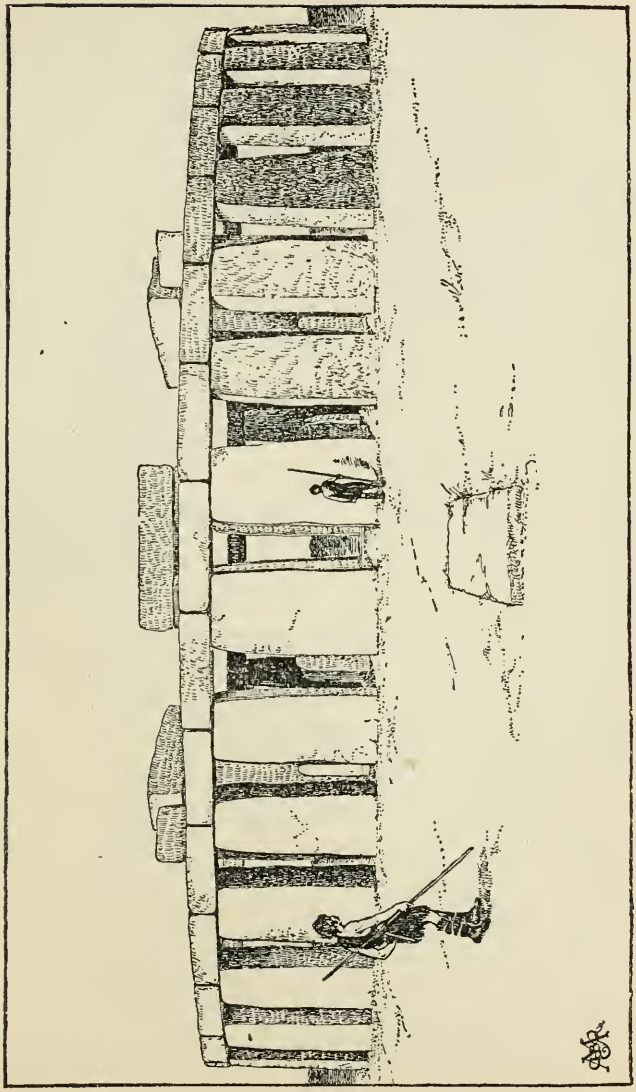


Fig. 43.—Stonehenge.

of the Sun, from which the priests or medicine men could take their observation. We accept the longest and shortest days as a matter of course, if we give the matter any thought at all, but not so the Neolithic man. It must have been a mystery to him, that the sun should appear in a shallow arc across the horizon in the winter, but climbs into the sky in summer-time. It annoys us on dull days to know that the sun shines behind the clouds and we cannot see it, and Stonehenge may have been a magic observatory, where the priests could determine the position of the sunrise when it could not be seen. The priests may have settled the seasons; have said now is the time to plant; now we will sacrifice to the Sun-god that he may make our crops grow. Again, we accept the miracle of growth and increase as a commonplace, but the Neolithic man, who, in one of his rough hand-made pots, had safeguarded his hardly won seed, did not commit it to mother earth without some offering, or propitiation, or sacrifice. The sacrifice was not necessarily just so much sheer cruelty as an offering to the gods of some person who was loved, or a pot or implement which was valuable, so that the person or family making the sacrifice might be blessed. The individual did not count for very much in those early days; the tribe came first, and if one must die to save the others it had to be. In some such way the sacrifice became a part of the ritual of early religions. We know how in Genesis xxii. 2 God said to Abraham, "Take now thy son, thine only son Isaac, whom thou lovest, and get thee into the land of Moriah; and offer him there for a burnt-offering."

In the twenty-first book of the *Iliad*, Achilles, after he has killed the son of Priam, throws him into the river, and speaking over him "exalting winged words," says, "Nor even the River, fair-flowing, silver-eddied, shall avail you, to whom long time forsooth ye sacrifice many bulls, and among his eddies throw whole-hooved horses down alive."

In Mr. and Mrs. Routledge's book, on the Akikúyu of British East Africa, there is an account of the people who dig for sand for use in making pottery. It is interesting, because it gives us an idea of the spiritual outlook of these people. The natives tunnel into the hillside for sand, like so many rabbits, and as they do not take any precautions, the burrow sooner or later falls in, and smothers the excavator. The Akikúyu do not take any steps to dig the poor fellow out,

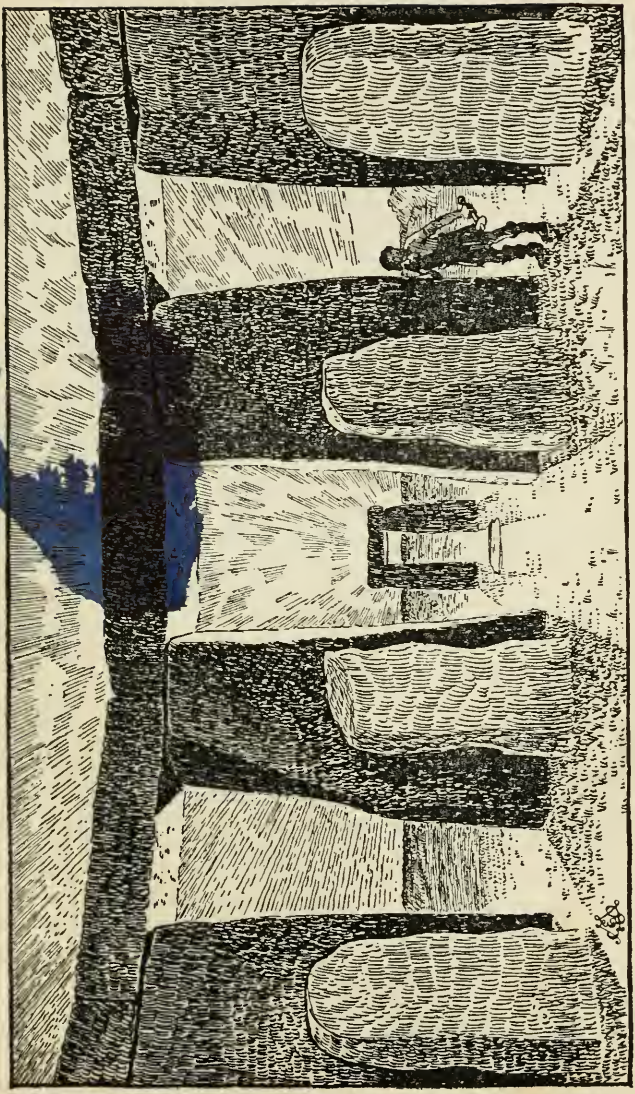


Fig. 44.—Sunrise on Midsummer Day at Stonehenge.

because this would offend the Spirit of the Sand Pit, but sacrifice a goat instead to propitiate the spirit, then start another burrow which, in its turn, necessitates another goat being sacrificed. This, we think, would have been the case with the Neolithic men : they would have worshipped the Sun, Moon, and Stars, the Rivers and Waters, the Mountains and Valleys, and a great Mother God over all. If by any chance the spirits were offended ; if certain things were done which were taboo, or forbidden, sacrifice had to be made. Just as the Akikúyu appear to be a very kindly pleasant people, who do not enslave one another, or go to war, so we can free the Neolithic men from the charge of cruelty.

Stonehenge does not appear to have had any connection with Druidism, which followed many centuries after. The Druids worshipped the Moon and Stars, and Stonehenge was a Sun Temple, built by an agricultural people, to whom the Sun was all-important.

So far as Neolithic man is concerned, his religion must have been a very real one to him, or he would not have taken so much trouble with the Megalithic monuments we have been describing. These were very widespread, and can be traced along the shores of the Mediterranean, through France, to this country ; we have seen how the Picts towers resemble the Nuraghi of Sardinia (p. 41), and the chambered barrows the Stone Age temples of Malta.

This art of building was in its way as wonderful as the Magdalenian paintings we wrote of on page 94 of Part I., and we must try and imagine the builders. There is a danger in archæology of thinking more of the things than of the people who made them ; we talk of flint implements, as if the New Stone Age could be collected in a bushel basket, and shown in the glass cases of a museum, and especially is this the case in the prehistoric period before there was any written history. The interest of things is that they were made by people, and when the things are temples and tombs they become extraordinarily indicative of the spirit of man ; of that essence, or aura, which gives him and his work individuality, and has made possible the great works of architecture, painting, poetry, and sculpture, and which makes it possible for a man to lay down his life for an idea. Any great movement which appeals to the mind of men has always been compounded of the spirit.

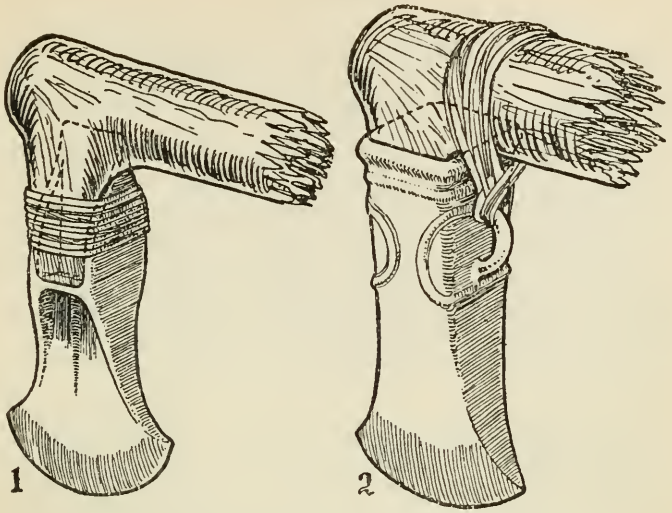


FIG. 45.—Hafting of Palstave and Socketed Celt.

CHAPTER II

THE BRONZE AGE

WE saw, in Part I., how the men of the Old Stone Age found a new material in bone and ivory, and the effect of this was to open up a whole range of new activities. They could make harpoons with barbs in bone, which were not possible in the intractable flint. The fishermen should place in their calendar of benefactors the Palæolithic worker in bone who invented the barb.

Even more so the introduction of metal wrought an enormous difference in the lives of men. The Neolithic herdsman, who splintered his stone axe on the skull of a springing wolf, saw the work of months vanish, and was in great danger himself, but when he was the owner of the first of the bronze celts, he walked abroad proudly. The edge of the celt might dull with use, but then it could be hammered up again ; it did not fly into fragments, and it could be hammered cold, which is an important detail to remember.

Trees could be cut down; houses would have been built more quickly than was possible before, and in a hundred different ways man was given a new confidence in his powers, and so was able to make progress.

We must not think of a Bronze Age which started full blown at a particular date, or of a people who threw away their flint implements one day, to arm themselves with metal on the next. It was a very slow and gradual change over. It is probable that the first flat celts were brought here by traders from the Continent, and many years may have elapsed before they were followed by the round-headed men we now associate with Bronze, and centuries before the Goidels, or first of the Celtic-speaking peoples who reached this country (see p. 12).

The art of Bronze working came from the East, by way of Italy and Gaul, and was widely spread, except in Africa, which never had a Bronze Age. We have seen, on page 12, that the Bronze men were more powerful physically than the Mediterranean race. Probably they were not all armed with bronze, but in any case in the end they conquered the Iberians. It was not a conquest of extermination, because we find in the round barrows, which are typical of the Bronze Age, round-headed men side by side with long-headed Iberians.

A parallel can be found in Greece, where the round-headed Achæans of the Heroic Age dispossessed the long-headed Minoans of Mediterranean stock.

As the art of metal working is the great central fact which has given the name of the Bronze Age to this period, it may be as well to start by a description of the methods followed by prehistoric man in his craft; in doing so we must try and place ourselves in his position, and imagine that we have never seen metal before. Bronze, we know, is an alloy of copper and tin, and we shall find that copper, like gold, is sometimes found almost pure, and is capable of being hammered up cold, without any preliminary smelting to reduce the ores. Iron ore is found in the form of red earth, or stone, and is not so obviously metallic, and would more easily have escaped attention than copper. The North American Indians hammered up pure copper, and made knives in this way before the coming of the European invaders. So the age of bronze may have been preceded by one of copper. Even when smelting and casting bronze had been discovered,

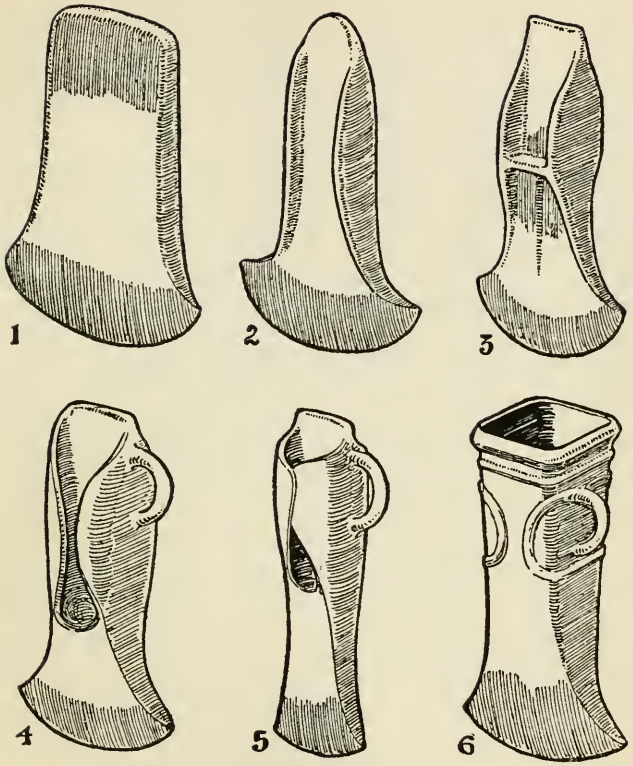


Fig. 46.—Development of Bronze Celt.

it was found that it could be forged cold, and that when it was heated, it tended to become short and fly to pieces when being hammered. It is hardened by hammering, and softened by heating and quenching, whereas iron hardens by heating and quenching. Bronze was an ideal metal for prehistoric man, because dulled edges could be hammered up again anywhere without very much trouble. It can be made extremely hard. The head of an engineering firm in Leeds writes us as follows : " I have just had in the shop, for making into a special spur wheel, a phosphor-bronze casting so hard that we could only just cut it, and tougher by far than any

cast iron and most steels." He adds: "If copper and tin were to-day as plentiful as iron, I believe that the latter would only be used for special tool steels." We gladly publish this statement of a twentieth-century engineer to cheer the shades of the old bronze metal workers.

We can now pass to smelting. Pottery had given man the idea of taking a plastic material and shaping it; he may have used clay to line a cooking-pit, and found that baking hardened it. In the same way the accidental introduction of copper ore into a cooking-pit, or a charcoal fire exposed to the wind, would have melted the ore, and this would have been found as metal when the ashes were raked aside. The metal may have cast itself into a shape which suggested a tool or weapon, and it would have prompted the ingenious man to experiment. In some such way it must have come about. The first moulds were simple flat open moulds, into which the molten metal could be poured, then progression was made to hollow casting with clay cores which could afterwards be scraped out. Stone, bronze, and probably fine sand were used, and actual moulds can be seen at the British Museum.

We get an inkling of how the bronze men went to work from the *Iliad* xviii. Hephaistos, the famed artificer, who "wrought much cunning work of bronze, brooches and spiral arm-bands, and cups and necklaces," when he starts work on the wonderful shield for Achilles—"went unto his bellows and turned them upon the fire and bade them work. And the bellows, twenty in all, blew on the crucibles, sending deft blasts on every side. . . . And he threw bronze that weareth not into the fire, and tin and precious gold and silver."

This would have been an apparatus very similar to that used for iron at the Glastonbury lake village, as shown in Fig. 72. Copper melts at 1083° centigrade, and tin at only 232°, so that the Bronze Age founder melted the copper first, then threw charcoal on to the melted mass to retain the heat, and added the tin. The ideal aimed at seems to have been 10 per cent. tin to 90 per cent. copper, but endless experiments went to the discovery that this made a good bronze. Prehistoric man did not know anything about analytical metallurgy. Surface copper ores sometimes contain tin-oxide, and the intelligent man would soon have been moved to find out why a celt made from this ore was tougher than one of pure copper.

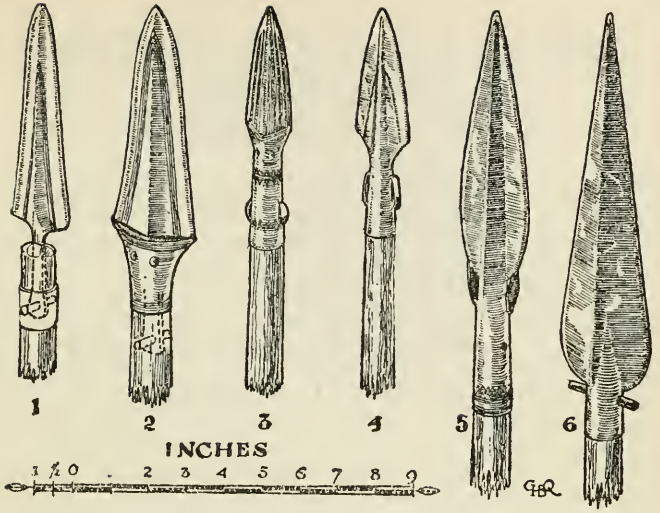


Fig. 47.—Development of Bronze Spear.

We can now pass on to the actual implements made, and Fig. 46 shows the development of the Bronze Celt. No. 1 is called the Flat Celt, and is obviously fashioned on the lines of the stone celt which preceded it, and was hafted in the same way as Fig. 45. The makers soon discovered that by hammering the edge it became thinner, keener, and wider ; so the upper part of the later celts is narrower.

No. 2 shows the Flanged Celt, formed by hammering over the sides. This was hafted as 1, Fig. 45. A stick with a stout branch was selected, and this being cut off, was forked to fit over the top of the celt, and bound to it by raw hide. The disadvantage was that the thin celt split the wood head. A stop ridge was then developed between the flanges, and this finally developed into 3, Fig. 46, which is known as a palstave, from an Icelandic word for a narrow spud. This stop ridge took the force of the blow, and prevented the head from splitting (see 1, Fig. 45). In this type, the web between the flanges, above the stop ridge, was thinner than the axe part under, and this feature is more pronounced in 4, where the flanges are hammered over into the form of what is known as the Winged Celt. No. 5 shows the wings lapping, and in 6

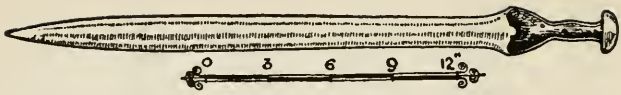


FIG. 48.—A Leaf-shaped Sword.

they have disappeared, and we arrive at the final Socketed Celt, which was hafted as 2, Fig. 45. There were endless intermediates, and the celt is well worth studying, because it is the ancestor of that friend of man, the axe.

The Bronze Spear is a weapon with an interesting history. It started life as 1, Fig. 47, and in this form was used either as a knife or a dagger. It was cast solid, and provided with a tang which was fitted into the end of the wooden shaft, and this latter was prevented from splitting by a plain bronze collar, through which a rivet passed and secured the end of the tang. In 2 the collar has become socket-shaped, and though not cast with the spear-head, is attached to it by two rivets, and the tang still remains. In 3 the tang has gone, and the socket is part and parcel of the spear-head. But an amusing fact should be noticed: that the rivets which once fastened it to the head remain as ornamental bumps. No. 3 has loops for thong attachment to the shaft, or for tying on feathers or streamers. In 4 and 5 the socket has further developed, and the spear-head is formed of fins cast on to the sides of the socket. In 5 these are leaf-shaped, and the loops are decorative. In 6 the whole spear-head is a triumph of hollow casting.

The Sword developed out of the knife by way of the dagger or rapier. It is easy to see that spear-head No. 1, Fig. 47, if it had a short handle fitted on to the tang instead of the shaft, would make a useful knife. A rapier was an elongated dagger, and the sword a later invention. Fig. 48 shows a beautiful leaf-shaped sword. The tang for handle was cast on the blade, with the edges slightly flanged up, and then in between these edges grips of horn or wood were riveted on each side through the tang, and a round pommel clipped on to the end. Leather scabbards were used with bronze tips called chapes. Bronze was not used for arrow-heads, but flint, as in Neolithic times. The two drawings, Fig. 46 of the celts, and Fig. 47 of the spears, show the development over the whole of the Bronze Age, and by reference to the chart

Fig. 49.—A Bronze Age Smith.

(pp. xi, xii) we shall find that this lasted not less than 1300 years. To realize how long a time this is, we must remember that 1300 years ago in this country would take us back nearly to the time of the death of Ethelbert, king of the Kentish men, and the first English king who received baptism.

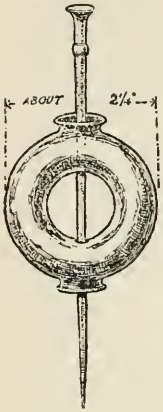


FIG. 50.—Bronze Brooch and Pin.

In Fig. 56 the central man is shown holding a circular Buckler or Shield made of a thin sheet of bronze hammered up into concentric circles of lines and dots. The buckler went with a leaf-shaped spear, as 5, Fig. 47. A flanged celt with slight stop ridge, a type midway between 2 and 3, Fig. 46, was found with a spear-head slightly earlier in form than 3, Fig. 47. The archæologist in this way, by associated finds, builds up a theory of the dates and developments of civilizations. Fig. 49, drawn from the actual tools at the British Museum, shows the equipment of a Bronze Age metal-worker. At 1 are his hammers, hafted like socketed celts. No. 2 shows a tanged chisel, and 3 a socketed gouge. No. 4 is a sandstone rubber, and 5 a quite delightful anvil.

One of the most interesting discoveries ever made in England was what appears to be the complete furnishing of a family at the end of the Bronze Age. This was found in Heathery Burn Cave, County Durham, which may have been used as a house, or as a place of refuge. From remains of skulls which were discovered, the inhabitants appear to have been long-headed men of Iberian or Neolithic stock, and it is possible that they removed to the cave in face of the danger of invasion. We shall see later how, at Glastonbury, a people of similar extraction were put to the sword by invaders.

The Heathery Burn discovery included a sword much the same as Fig. 48, but with slight shoulders on the cutting edge of the blade near the handle. A leaf-shaped spear-head, as 5, Fig. 47, but without the loops. Bronze discs 5½ inches diameter, which may have been used as dress ornaments or horse trappings. Bronze collars which fitted on to the nave or hub of chariot wheels, and which, in conjunction with the bridle bit, show that the horse was used. A bucket was found, and tanged and socketed knives ; a razor, gouge, and a socketed celt as 6, Fig. 46 ; chisels, awls, pins, rings, tongs, and gold armlets. There were bone prickers, spindle whorls, skewers, knives, the cheek-bars of bridle-bits, and jet

armlets ; and all these things can be seen at the British Museum. This splendid find includes nearly all the known types of Bronze Age implements, and we have founded our illustrations on these Heathery Burn discoveries.

The spindle whorl shows that spinning was practised in the Bronze Age in this country ; both spinning and weaving are supposed to have started in the Swiss lake dwellings as early as the Neolithic times. Various types of dress fastenings began to come into use which were suitable for light woven fabrics. Fig. 50 shows a bronze brooch from Ireland, shaped rather like a large hollow curtain-ring, and so arranged that a bronze pin could be passed through it, and in this way fasten a cloak drawn through the ring. This type may have suggested the penannular brooch, as Fig. 76.

Spinning

In a barrow in the East Riding, Yorks, of this period, the remains of a linen winding-sheet were found under a skeleton, and woollen fabrics have been found in others ; these could only have been woven on a loom. We will consider, then, the steps which a Bronze Age weaver had to take if she wished to convert a fleece into a piece of stuff for making clothes. It would need washing and cleansing first, and then came dyeing. Crotal, a lichen growing on trees, may have been used. If this is put in a pot with the fleece and water, and boiled for one or two hours, it produces a rich red-brown colour. Teasing consists of pulling the fleece into fluff, and oiling explains itself. Carding is an operation which consists of putting the wool on an implement rather like a large butter-pat with teeth, called the card, and then pulling the other card across it, so as to arrange the wool for spinning. This latter was the occupation of girls for so many centuries, that we still talk of an unmarried woman as a spinster.

The spindle which was used in the Bronze Age consisted of a piece of wood, perhaps about 1 foot long and ½ inch diameter, and a few inches from one end came the whorl, which acted as a miniature fly-wheel and helped to twist the spindle. At the other end was a little nick in which the yarn was fastened. In spinning, a roll of carded wool was held in the left hand, or bound on to a distaff ; from this roll a little wool was pulled out and twisted by the fingers until a piece

Fig. 51.—Spinning.

of yarn was made about 18 inches long, and this was tied to the spindle. The wool was then paid out with the left hand, and the spindle twisted with the right. When the spindle stopped revolving it was held, when the twist ran up the length of wool which had been paid out and made this into yarn, which could then be wound on to the spindle and the spinning resumed. We have shown this in Fig. 51.

Weaving

Weaving is, and has been since the Bronze Age, one of the crafts which has had the greatest influence on the progress of man. It is beautiful work, done wherever man wants clothes, and carried out in many different ways; but the main principle of weaving is always the same. The long threads running through the length of a piece of cloth are called the warp; the ones which cross these by going under and over the warp are called the weft. From the discovery of loom weights as shown at the bottom of the warp-threads in Fig. 52 in the Swiss lake villages and in England, it is thought that the earliest looms were of this pattern, which is called the Warp-weighted Loom; the weights keeping the warp properly stretched. The warp-threads are kept in place by yarn threaded through them at the bottom. It is probable that at first the weaver took the skein of yarn in

her right hand, and picking up the warp-threads one or two at a time with the left hand, passed the weft-threads through from side to side, over and under the warp. She may have used a wooden lath to beat the weft-threads up, and so make the cloth compact.

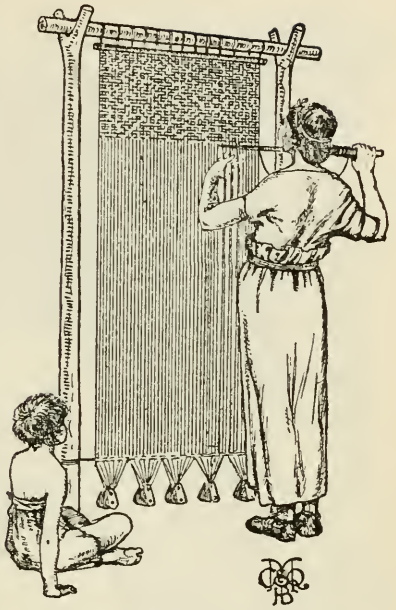


FIG. 52.—Warp-weighted Loom of Simplest Type.

Fig. 53 shows the next development, and our drawing is based on the Scandinavian loom in the Copenhagen Museum. The diagrams at the side, A and B, illustrate the method of weaving, and we shall find as we go along that, though the details are elaborated, this principle remains. A piece of fabric has been woven at the top downwards, and below this the warp-strings hang down with their weights on the ends. They are divided at 1 by a shed-stick : the shed is the space through which the weft is passed. At 2 is the heddle-rod, which is attached to alternate warp-strings by loops. The weaver then passes his shuttle through the space between the warp-strings, above the heddle-rod in A position, which is called the counter shed. The heddle-rod is then pulled out to B position, which brings the warp-threads which were at the back to the front, and the weft is again passed through the space now called the shed.

In this way the weaving proceeds, like darning, first under and over the warp-strings, then over and under. This would make a plain cloth ; in patterned work different coloured yarns can be used, and instead of just over and under the

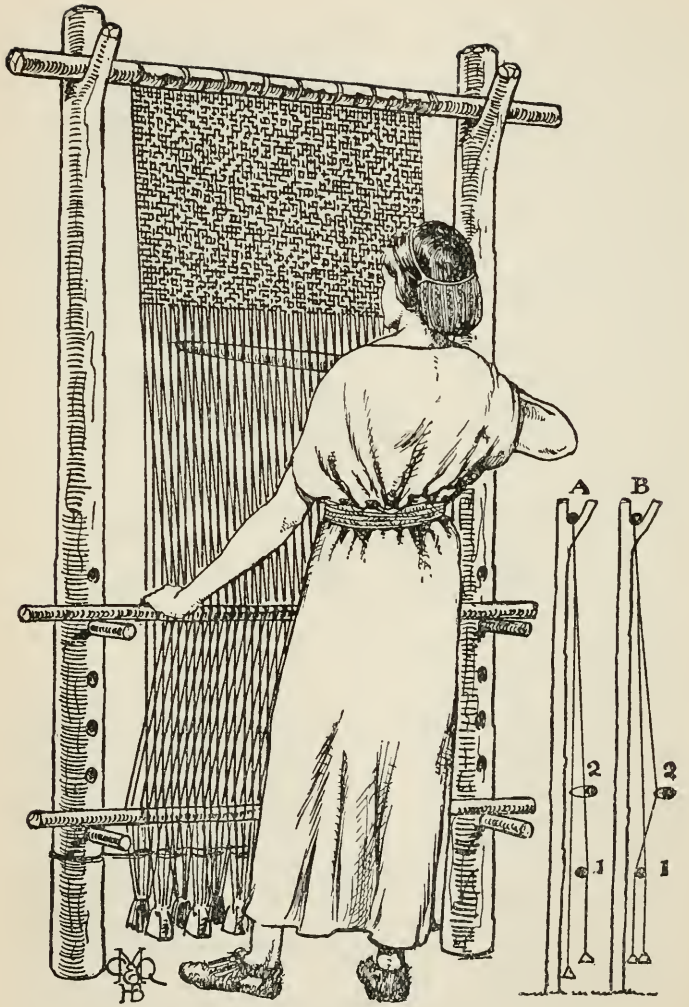


FIG. 53.—Warp-weighted Loom of more Developed Type.

warp, you can go over and under and then skip two or three, and so produce a pattern. On Greek vases Penelope is shown working at an upright warp-weighted loom like Fig. 53, but it has been developed by making the top cloth beam to revolve, so that the cloth could be wound up as it is woven.

Fig. 54 shows what is called now a weaver's comb, found at Glastonbury lake village, but we doubt if this was used, as suggested, to comb or pack the weft-threads tightly together; it would have been an inconvenient way of doing it; so here is a problem for our readers to determine the use of the comb.

Fig. 55 shows a man shaving with a razor of a very usual pattern in England during the Bronze Age; he probably used oil instead of soap.

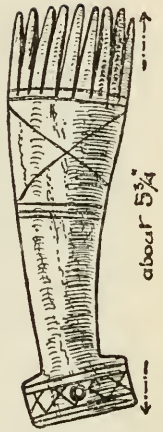


FIG. 54.—Comb.

Fig. 56 is a costume plate for the three periods of this book, and it is the central figures which are of Bronze Age and so discussed here. The remains of dresses of this period have been found in Jutland, which suggest that the piece of stuff woven on the looms was wrapped around the body without any shaping. This is the case with the tunic of the man and the skirt of the girl. In the case of the man this was the beginning of the kilt. The girl's bodice would have been roughly cut in kimono shape, and the side seams sewn under the arms. She is shown wearing a bronze disc fastened on to a woven tasselled belt, and her hair was gathered into a thread net, and fastened by long bronze pins. She is wearing a jet necklace. The shoes of both man and woman are of skin, and the man has a circular cloak and cap of thick rough knotted wool.

We have seen on page 58 that one of the finds at the Heathery Burn Cave was a point of deer antler, about 5 inches long and curved in shape; it is pierced twice on the radial lines of the curve, and once at right angles. Similar pieces have been found in the Swiss lake dwellings, and it is suggested that these were the cheek bars of bridle-bits, as Fig. 57. Probably the first bit was a twisted leather thong, knotted at the width of the mouth, and then the ends passed through the

FIG. 55.—Shaving with Bronze Razor.

cheek pieces as reins. If the transverse hole of one of these horn bars is examined, it will be found to be worn smooth as by a leather rein. A sketch is added to the drawing of a bronze bit from the Swiss lake dwellings, which shows the influence of the early antler type. The pony in Fig. 57 is wearing the gold Peytrel, or breastplate, discovered at Mold, Flintshire, which is now in the British Museum. It would fit a pony of about twelve hands, and it is embossed in the same style as the bucklers. When one bears in mind that the warrior to whom it belonged did not in all probability decorate his horse, until he had satisfied his own vanity, we can be quite sure that together they must have presented a splendid sight.

The Heathery Burn discovery includes bronze nave collars for chariot wheels. The nave of a wheel is its hub, and this suggests spokes. The first wheels were probably solid on their axle, rather like a cotton reel. A, Fig. 58, shows another type made up of three boards secured by dovetailed clamps. B, Fig. 58, shows the start of the spoke, not as we know it to-day, but arranged more as a brace. The upright part includes nave, two spokes, and parts of the felly or rim, all in one piece of wood. The four other spokes are braced between this and the remaining parts of the felly. These come from the Swiss lake dwellings, and must be early types, because a later wheel has been found there which, though in bronze,

FIG. 56.—Costume of the New Stone Bronze and Early Iron Ages.

To face p. 64.]

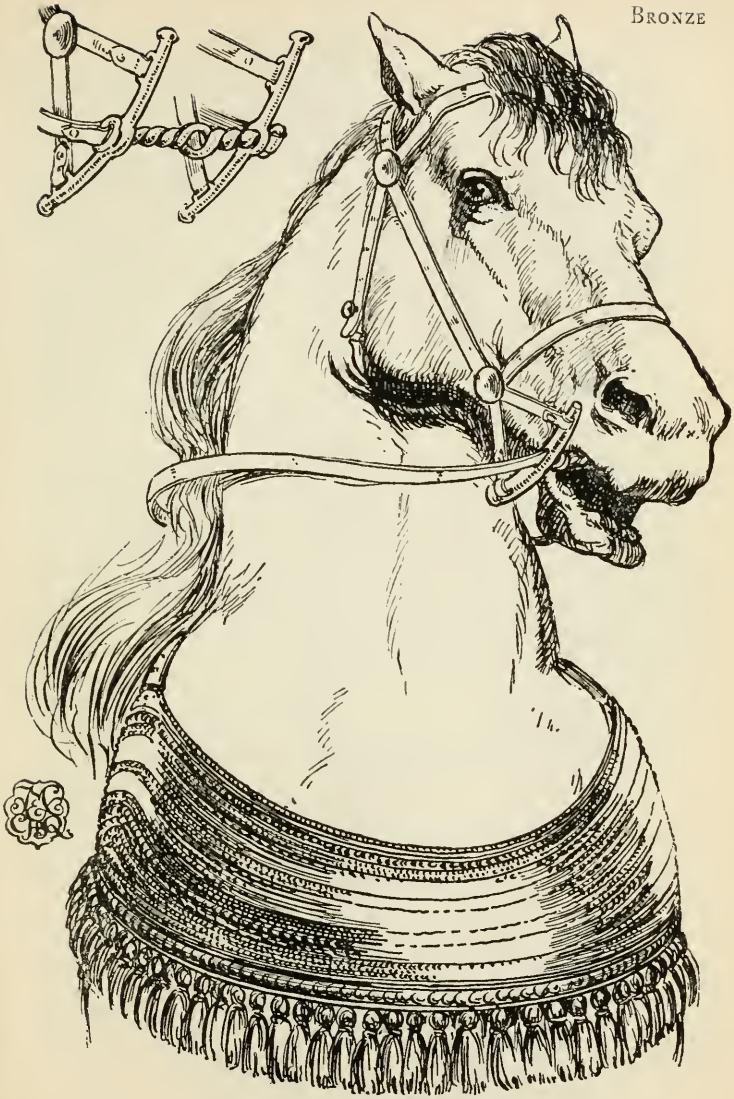


FIG. 57.—Bridle and Gold Peytrel.

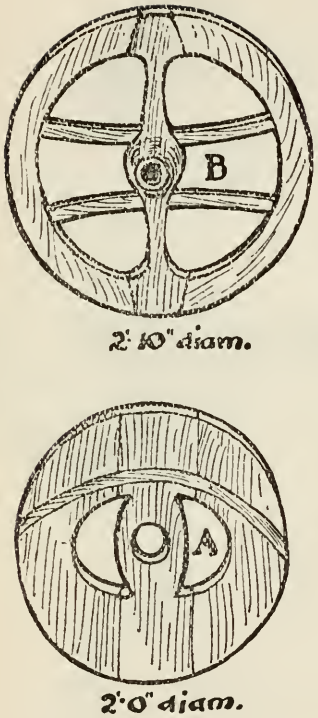


FIG. 58.—Wooden Wheels.

must have been founded in a wooden construction. It is 19¾ inches in diameter, and has four spokes radiating between nave and fellies, just like the wheel of to-day. We know too that beautifully turned wooden wheel naves have been found at Glastonbury lake village, dating from the Early Iron Age, and in what are called the chariot burials of Yorkshire, of the same period, the iron tyres of chariot wheels have been discovered.

The original Aryan-speaking peoples, the forerunners of the Celts, are supposed to have possessed ox-wagons, and it may well be that chariots were introduced by the Goidels, who reached these shores from 700 to 500 B.C.

The chariot does not give very much opportunity to the maker to vary its shape. There must be a floor framed up on the axle, around which would come the body, perhaps of wickerwork covered with hides. There would have been a centre pole, with yoke attachment to the horses. The chariot of classical times must have been founded on some such simple basis as Fig. 1.

This question of wheel naves, the discovery of jet armlets at Heathery Burn Cave, and shale cups in round barrows, all of which must have been turned, brings up the question of lathes. It is difficult to see how a simpler turning contrivance than the Pole Lathe (Fig. 78) could be made, and this may date from the Bronze Age.

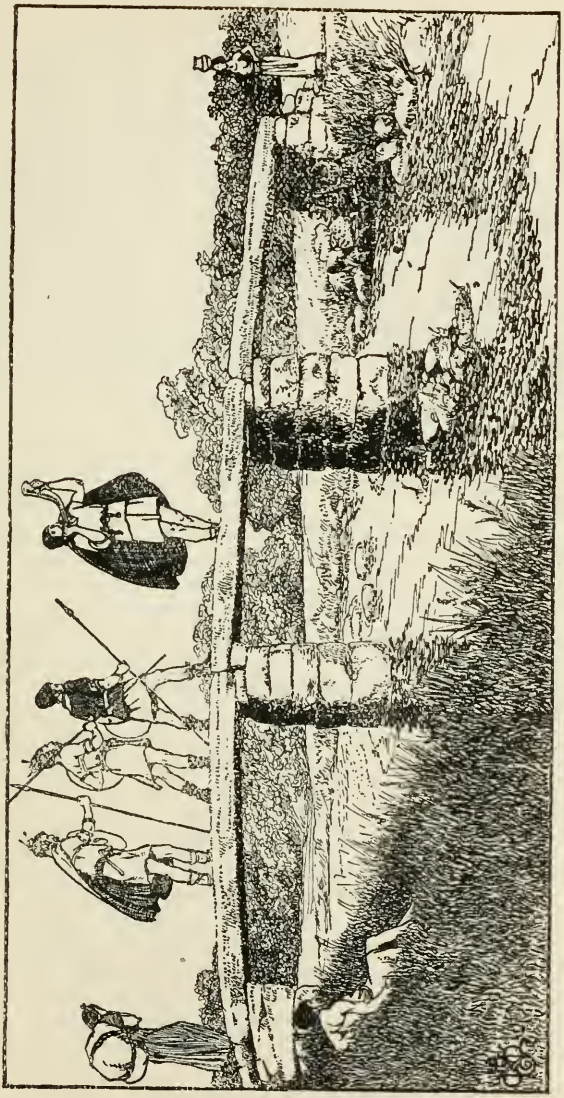


Fig. 59.—Celtic Bridge.

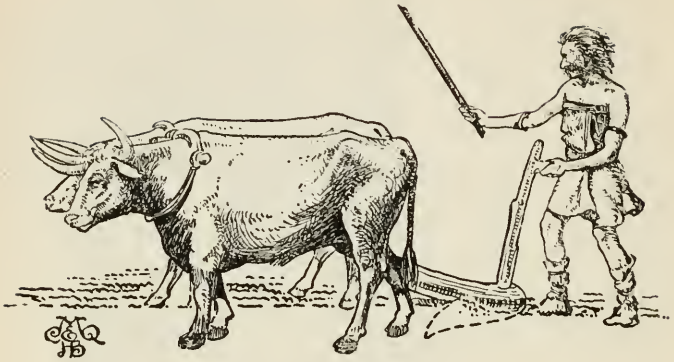


Fig. 60.—Plough.

The Hill Forts and Camps were still the rallying places of the people, and it is probable that places like Badbury, Maiden Castle, and many others which had been started by the Neolithic men were improved upon in the Bronze Age. The trackways on the hilltops between the camps would have become more defined as traffic and trade routes, with tumuli to mark the line. Fords may have been replaced by bridges ; there are two on Dartmoor which are still called Celtic. Fig. 59 shows one of these at Postbridge, and its construction is just what we should expect from a people who had inherited the building tradition of Stonehenge. We should like to draw attention to the trumpet shown in the hands of one of the figures. These instruments derive their shape from the horns of animals, which had been used for the same purpose before. They were made at the end of the Bronze Age, in that metal, and are supposed to have been used by the Celtic people in warfare ; of two types, some have the mouthpiece at the side.

The possession of the bronze celt, with its better cutting powers, meant that man could make ever larger clearings in the forest, grow more corn, and keep more herds. He was helped again, because with his bronze sickle the harvesting of his crops was not such a problem as when that useful implement was of flint, as Fig. 21. There is a beautiful harvest scene in the eighteenth book of the *Iliad*—" where hinds were

reaping with sharp sickles in their hands. Some armfuls along the swathe were falling in rows to the earth, while others the sheaf-binders were binding in twisted bands of straw. Three sheaf-binders stood over them, while behind boys gathering corn and bearing it in their arms gave it constantly to the binders; and among them the king in silence was standing at the swathe with his staff, rejoicing in his heart. And henchmen apart beneath an oak were making ready a feast, and preparing a great ox they had sacrificed; while the women were strewing much white barley to be a supper for the hinds." Game was less eaten now than the domesticated animals; a proof that life was becoming easier, and it was not necessary to live by the chase. There are Scandinavian and Ligurian rock carvings of Bronze Age date, which show a primitive plough drawn by oxen, as Fig. 60, but England was the very outpost of civilization in those days, and we cannot be sure that the plough reached here so early; yet it would not have needed so much cleverness to make as a bronze celt, once the idea became known.

The hut of the hut circle was much the same as in Neolithic times, built in the Berm of the camp or just around it; but from remains which have been found, it looks as if the hut itself was becoming less pit-like, and rising out of the ground with vertical side walls, as Fig. 67. It must be remembered that the Bronze Age men had their enemy the wolf, waiting always just round the corner to cut off stragglers, so we may be sure they lived in communities.

Pottery was still hand-made, without a wheel, but ornament was improving, and consisted of straight lines arranged as chevrons, lozenges, herring-bones, with dots and concentric circles, as Fig. 61. No. 1 in Fig. 62 is a Beaker, or drinking-vessel, which was introduced on the East Coast by the Beaker people, see page 11; it is found with unburnt burials. No. 2 is a Food Vessel. No. 3 a Cinerary Urn, made to hold the ashes of a cremated burial; and No. 4 an Incense Cup. This does not mean that the Bronze Age people used incense, and the name has been suggested by the pierced treatment of the little cups; these are found in Round Barrows, and may have been used to bring the sacred fire which started the funeral pyre. It is thought that these types of pottery, which were doubtless deposited with the dead, for their use in the spirit world, are similar to those they used in their everyday life. Bronze

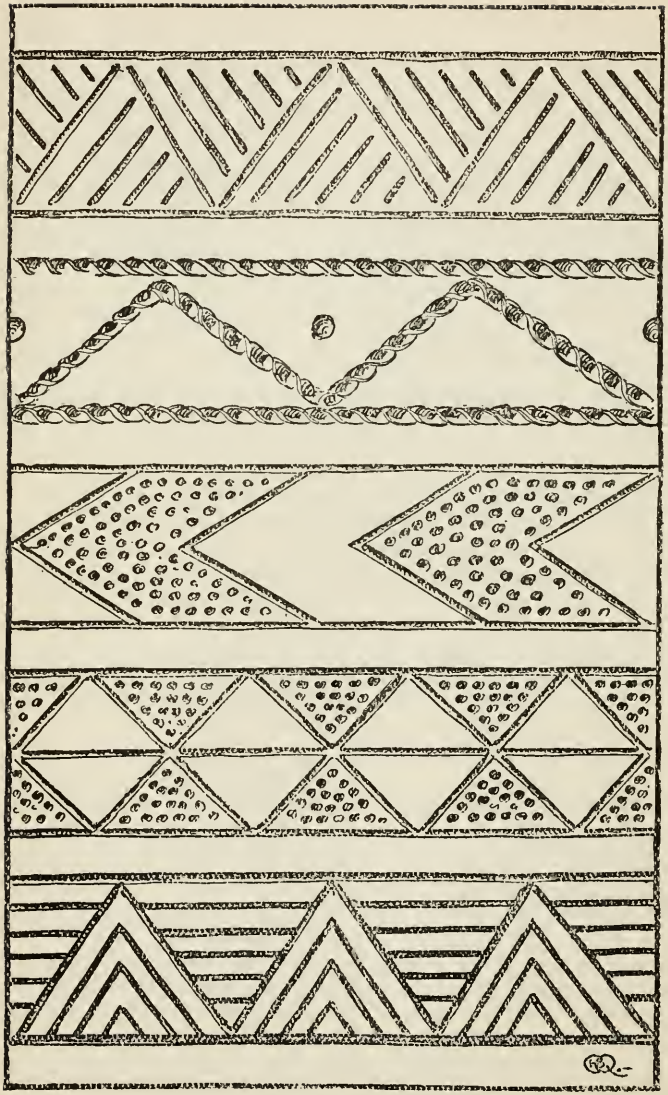


FIG. 61.—Bronze Age Ornament.

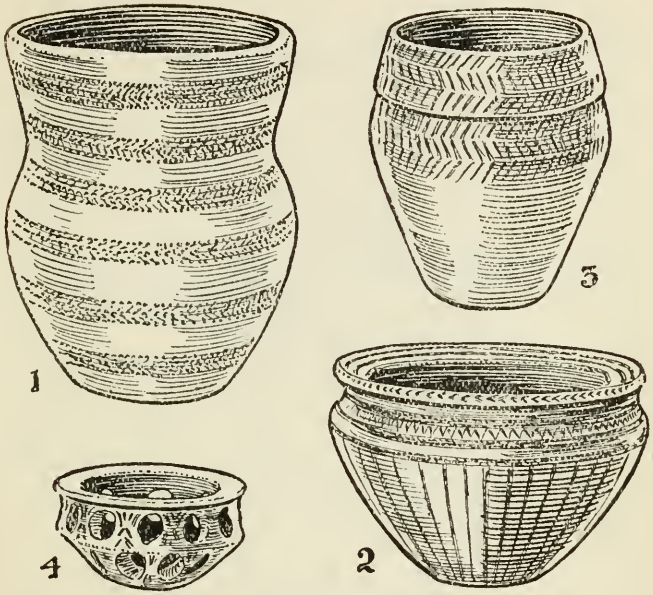


FIG. 62.—Bronze Age Pottery.

implements were buried for the same reason, but were generally limited to plain axes, knife daggers, and awls, and this limitation points to some symbolical meaning in those selected.

Burial was either by burying the body (inhumation), or by burning it (cremation), and it is a little bewildering to find both methods practised at the same time, because inhumation is distinctly Neolithic, and cremation a Celtic custom, and yet this latter was practised before the Celts arrived. This points to a survival of the long-headed people and their ways, and the introduction of cremation as a fashion by the earlier round-heads from the Continent. A pit was dug in the ground, and a stone cist, of four stones on edge covered by another, made to cover it, or a hole cut in the chalk, and the ground heaped over in the form of a round barrow. In a stone country, the barrow was made of heaped stones, and became a cairn. No. 1, Fig. 63, is the type which is called a

Bowl Barrow, because it is like an inverted bowl. No. 2 a Bell Barrow, because the ditch and bank made around the outside give it that shape; and No. 3 is a Disc Barrow.

A barrow is sometimes called a Tumulus; in Derbyshire, a Low; and in Yorkshire, a Howe.

Silbury Hill, 6 miles W. of Marlborough, on the Bath Road, is in the form of a round barrow, but it is 135 feet high, and covers 6 acres. It is wholly artificial, and in 1907, at the rates of pay then obtaining, its cost was estimated at £20,000.

Cup and ring markings are common on the cover stones of the cists or graves in the barrows, and these are very similar to the markings found on the churingas of the Australian aborigines (p. 64, Part I.).

Small objects called Sun Discs are found in Ireland; these are made of gold about $2\frac{3}{4}$ inches diameter, and have the same decorative idea as the cup and ring markings, made up of concentric circles. All these things point to Sun-worship being characteristic of the Bronze Age; another symbol, which is widely distributed, is the swastika, also considered a symbol of the Sun.

It must be borne in mind that prehistoric man was still held in thrall by magic and mystery; that there were many things which were taboo or forbidden; like the Akikúyu his life and death were governed by a complicated ritual. Cremation in all probability was not practised to destroy the body, but to purify it of sins and uncleanness, and render the spirit pure for the life hereafter. The spirit of the hapless Patroklos appears to Achilles and urges him: "Thou sleepest, and hast forgotten me, O Achilles. Not in my life wast thou ever unmindful of me, but in my death. Bury me with all speed, that I pass the gates of Hades. Far off the spirits banish me, the phantoms of men outworn, nor suffer me to mingle with them beyond the River, but vainly I wander along the wide-gated dwelling of Hades. Now give me . . . my due of fire." We have seen that the implements which were buried with Bronze Age man were limited to certain symbolical types. Again we find that in the actual cinerary urns were buried, with the human remains, the bones of wild animals, like the fox, mole, and mouse; surely these typified something. In the barrow itself, the bones of the ox, goat, sheep, horse, pig, and dog have been found with cremated

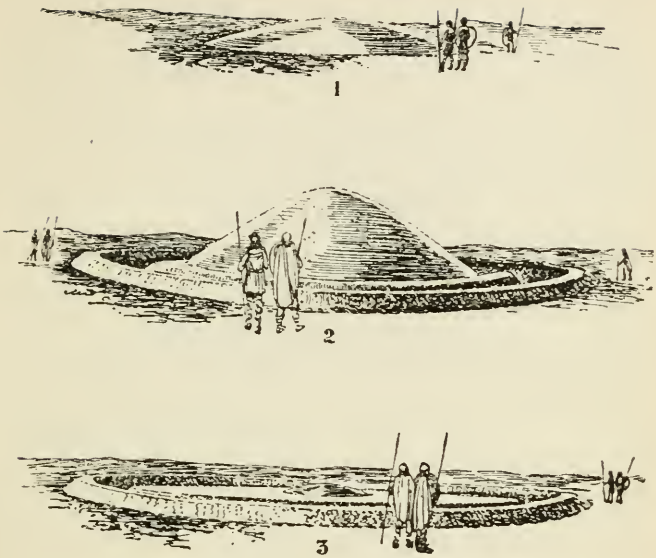


Fig. 63.—Bronze Age Barrows.

burials ; of these some may be the remains of the funeral feasts, and the horse and dog may have been slaughtered to accompany their master, and the sacrifice of slaves and captives may have formed part of the ceremony. Bone pins have been found, charred by fire, as if they had fastened the body in its shroud before it was burned.

Homer, in the twenty-fourth book of the *Iliad*, gives a wonderful picture of the burial of Hector:

"So nine days they gathered great store of wood. But when the tenth morn rose with light for men, then bare they forth brave Hector, weeping tears, and on a lofty pyre they laid the dead man, and thereon cast fire.

"But when the daughter of Dawn, rosy-fingered Morning, shone forth, then gathered the folk around glorious Hector's pyre. First quenched they with bright wine all the burning, so far as the fire's strength went, and then his brethren and comrades gathered his white bones lamenting, and big tears

flowed down their cheeks. And the bones they took and laid in a golden urn, shrouding them in soft-purple robes, and straightway laid the urn in a hollow grave and piled thereon great close-set stones, and heaped with speed a barrow, while watchers were set everywhere around, lest the well-greaved Achaians should make onset before the time. And when they had heaped the barrow they went back, and gathered them together and feasted right well in noble feast at the palace or Priam, Zeus-fostered king."

"Thus held they funeral for Hector, tamer of horses."

Even fuller details are given in the twenty-third Book of the funeral of Patroklos, and the funeral games. Of how they went forth "to hew high-foliaged oaks with the long-edged bronze," and "splitting them asunder the Achaians bound them behind mules," and so brought the wood to the appointed place, and made a great pile. "And they heaped all the corpse with their hair that they cut off and threw thereon." The pyre was "a hundred feet this way and that, and on the pyre's top set the corpse." "And many lusty sheep and shambling crook-horned oxen they flayed and made ready before the pyre; and taking from all of them, the fat, great-hearted Achilles wrapped the corpse therein from head to foot, and heaped the flayed bodies round. And he set therein two-handled jars of honey and oil, leaning them against the bier; and four strong-necked horses he threw swiftly on the pyre, and groaned aloud. Nine house-dogs had the dead chief: of them did Achilles slay twain and threw them on the pyre. And twelve valiant sons of great-hearted Trojans he slew with the sword" to be consumed by the fire. The North Wind and the loud West "all night drave they the flame of the pyre together, blowing shrill," and after a barrow was made as already described for the burial of Hector. Then followed the funeral games, of which all can read in the twenty-third book of the *Iliad*. The next time we see a Round Barrow, we must think of it, not as only so much heaped earth, but rather as a visible sign of our own Heroic Age. We must try and conjure up a picture of the flaming pyre, and looking across the smoking eddies of time, see the crowd of Bronze Age warriors burying their chief.

Now we think we had better try and give our readers some idea of the migrations and minglings, the traffic and trade routes, which had developed in the Bronze Age from the

earlier Neolithic beginnings. We must first ask ourselves, why it is we find these big movements of men, because, leaving on one side the adventurous few, the general run of people do not move until they are pushed. In the Old Stone Age, man moved because he was a hunter, and had to follow the chase to live, and in the same way, even when he had settled down, he could not be sure of a permanent home, unless it was accompanied by a perennial food supply ; if this failed, then he had to break fresh ground. If food was one of the reasons for his moving, he naturally went away from the crowded central area, or falling on his neighbours compelled them to do so. Wars have played a terrible part in migrations ; we shall see in our time great movements of people, as a result of the 1914–1918 struggle. The study of these movements is of great value as bearing on the original homes of men. That is why the archæologists continually do dig ; they are hunting for first causes.

Geography will help us to discover the natural causes of man's movements on certain lines. On p. 14, Part I., we referred to the Loess land. Loess is a sandy, chalky loam, deposited at first as dust blown by great blizzards from the glaciers in the Ice Ages. This loess is in a broad zone, which, starting from the Ural Mountains, stretches across South Russia to the Carpathians, and the Danube, then through North-West Austria to South Germany, and the North of France. It is shown by dots on Fig. 64. The fine grain of the loess prevented the spread of forests, and became instead the great grasslands which have played so considerable a part in the development of Europe. Here have been bred great hordes of men, who in times of drought, or when the regions became overpopulated, have descended on the ancient civilization of the East, and caused movements of men. In the same way, the Arabian Desert has been a great reservoir of hardy people, who periodically have made exodus, with terrible happenings to their prosperous neighbours, or have been bribed to keep the peace.

The problem which confronts such a people is similar to that of the hill-tribes of the N.W. frontier of India. Here the Mohmands, Afridis, Wazirs, and Mahsuds, perched on the barren hills, can only live by levying tribute on the caravans passing from the fat lands. Here through the great land gate of the Kyber Pass, through all the ages, immi-

grants have gone into India. The Aryans, and Alexander : all travelled on this line until we forced a new way by sea.

If along a certain line similar kinds of pottery or stone monuments are found, it is fair to assume that these are the work of a particular type of people moving along this line. If in Bronze Age barrows, we find gold from Ireland, glass or beads from the Mediterranean, amber from Scandinavia, or in an Early Iron Age cemetery at Aylesford in Kent, a bronze flagon from North Italy, it points to trade and trade routes. We may be sure that salt was traded.

We have already written, on page 10, of one of the earliest migrations, that of the Mediterranean people ; on page 11, of the first of the round-heads ; on page 12, of the arrival of the Beaker people ; and, on page 12, of the movements of the Aryan-speaking peoples. This brings up another factor of great importance in the lives of men, and one which is not concerned so much with their movement, as with the circulation of some great idea that acted as a lever, and caused them to alter their mode of living. The wonderful drawings and paintings of the Aurignacian and Magdalenian periods, in the Old Stone Age, which we discussed in Part I., and the Megalithic buildings of the New Stone Age, were wrought around some central inspiration ; again, in the latter half of the Bronze Age, the prophets were at work, and we find the introduction, by the Aryan-speaking peoples, of cremation and all that it may have implied. The Minoan civilization was centred in the island of Crete, the home of Minos, and then transferred to Mycenæ on the mainland of Greece. The Cretans were of the Mediterranean stock ; and if reference is made to the chart on pages xi, xii, it will be seen that final catastrophe overwhelmed them about 1000 B.C. Their buildings were megalithic, and they did not cremate their dead. While the Minoan civilization was dying, we hear of the beginnings of the Heroic period of the Hellenes. Jason, Agamemnon, Hector, and Odysseus are typical of wild men who came from the N., finding their way down from the grasslands shown on Fig. 64, and they were an Aryan-speaking people who cremated their dead. The Achæans were followed by the Dorians, and in the end a glorious civilization was destroyed in Greece ; but its renaissance was so wonderful that to-day we accept its ideas and philosophy as a standard of quality against which we measure our own. This, of course, is all beyond the scope

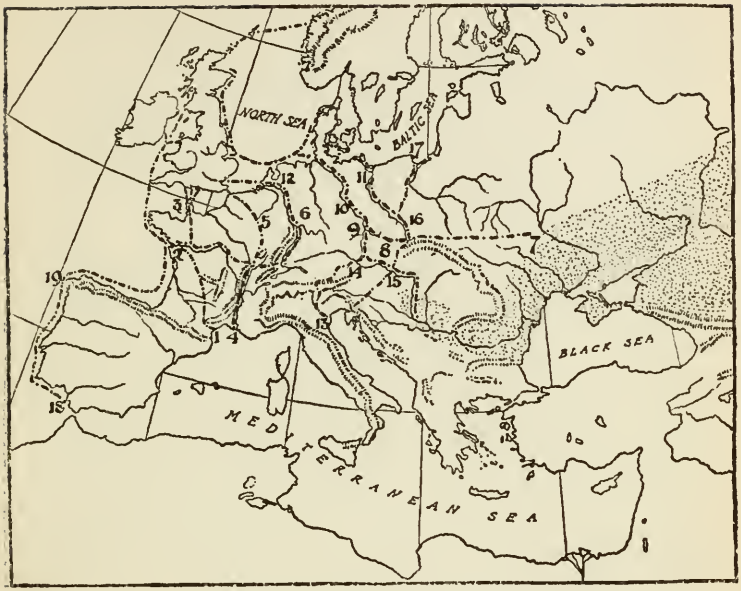


Fig. 64.—Traffic and Trade Routes.

of our book, but it must be kept in the backgrounds of our minds ; meanwhile we will go back to our trade routes.

If the Mediterranean men found their way through Gaul, on a line 1, 2, 3, Fig. 64, a later route seems to have been from Marseilles (Massilia) at 4, by the Rhone Valley to Châlons, where it divided into three lines ; one to the W. down the Loire to 2, the second around the Paris basin at 5, and the third through the Belfort Gap, between the Vosges and Jura Mountains, and down the Rhine at 6. This latter route is an important one, because it mingled people coming up from the Mediterranean, with another type coming from the regions to the N. of the European and Asiatic Mountains.

Prof. Fleure, in his paper on the *Racial History of the British People*, thinks that the Beaker people came from Kiev on the Dnieper, S. of the Pinsk Marshes (7, Fig. 64), and in Mr. Crawford's paper on the Bronze Age Settlements,

we find a map of the localities in which their distinctive pottery has been found; at 8, on the tributaries of the March in Moravia; on the Bohemian tributaries of the Elbe by Prague; around the junction of the Saale and Elbe at 10; the mouth of the Oder at 11; on the Zuyder Zee at 12; and again at the junction of the Rhine and Main at 6. Mr. Crawford shows how pottery beakers of the same type are found on our eastern coasts from Caithness to Kent, and also found on the W. coast of Scotland.

The W. coast of Denmark, and the S. Baltic, supplied amber during the Bronze Age, and the B.M. Guide Book for that period gives the two main trade routes through Germany to the Adriatic. One started from Venice at 13, Fig. 64, up the valley of the Adige, through the Brenner Pass, down the Inn to Passau on the Danube, at 14, and then by way of the Moldau to the Elbe, and so by the line 9, 10 to Denmark. The second route was from Trieste to Laibach and Graz, then to Pressburg on the Danube (15, Fig. 64), from there up the River March, across Moravia and through Silesia, along the Oder at 16, then across Posen to the Vistula, and Dantzig at 17. The spiral design of the Bronze Age found in Scotland, Cumberland, Lancashire, Northumberland, S. Ireland, and Merionethshire, and which was common in Egyptian and Ægean art, is supposed to have found its way here on the first of these two routes.

We can now pass from land journeys to sea voyages, and we will work back from Cæsar's time. It was the Veneti, maritime tribesmen occupying what is now Vannes Morbihan, in Brittany, who formed a confederation of the tribes in N. and N.W. Gaul against the Romans. The Veneti seems to have controlled the trade with Britain, and possessed a fleet of large ships with leathern sails, high poops, and towers, but did not use oars, which was the reason they were beaten on a calm day by the Romans.

If we go back again to the time of Pytheas of Marseilles, about 330 B.C., we find that he sailed to Britain, and there was in his time a regular trade between Cornwall and Marseilles, and probably a sea-borne trade between Cornwall and Cadiz (Gades) (18, Fig. 64), which was a centre of the tin trade. From Cape Finisterre, Pytheas sailed E. along the N. of Spain to Corbilo at 2, on the mouth of the Loire, past Ushant to Land's End (Belerium), where he landed. He sailed all

round Britain, and attempted an estimate of its circumference and indicated the position of Ireland. Long before this, as we have just seen, the Beaker people came across the North Sea, and settled on our East Coast ; so even the prehistoric period had its great seamen and sea-faring traditions.

This enables us to take up the question of the position of the Cassiterides (from the Greek word for tin, *cassiteros*), or the tin islands of the ancients : were they really islands ? The Greeks and Romans obtained tin from Galicia (19, Fig. 64), Cornwall, and possibly the Scillies, but the main supply was from Cornwall, and possibly it is the British Isles which were the Cassiterides.

Pytheas says tin was conveyed by the people of Belerium in wagons, at low tide from the mainland, to the island of Ictis, where it was purchased by merchants, carried to Gaul, and transported on pack-horses to Marseilles, the overland journey taking thirty days. To start with there has been considerable doubt as to the locality of Ictis ; some think it was S. Michael's Mount, others the Isle of Wight or Thanet. The tin must have been mined in Cornwall, and it would have meant a long overland journey to the two latter places.

We have seen there were good sailors, and the general weight of evidence inclines us to accept Dr. Rice Holmes' view, that the tin was shipped at S. Michael's Mount, close to where it was mined. The fact that the Veneti formed the confederation against Cæsar points to a predominance based on trade, and they may have controlled the tin traffic, in which case Corbilo (2, Fig. 64) would have been a natural place for unshipment.

From Corbilo to Marseilles is approximately 500 miles on 2, 1, 4 line, which means nearly 17 miles a day for the pack-horses on the thirty days' journey. The tin was cast into ingots, of the shape of ankle bones, and 2 = load for a pack-horse.

Britain has always been rich in metals. Copper is found in Cornwall, Cardiganshire, Anglesey, Llandudno, and in Ireland. Tin in Cornwall and on Dartmoor. Prehistoric man would have obtained his copper from boulders, or found lumps of ore on the hillside, and tin from the gravel beds of streams. Ireland was El Dorado of the Old World, and gold was found in the Wicklow Hills as late as 1795. It was shipped across to Carnarvonshire, or the mouth of the Mersey,

and from there found its way down by way of Shrewsbury, Craven Arms, Wootton Bassett, Sarum, and a deeper and more navigable Avon to Christchurch, and so across to Cherbourg. Another route appears to have been from the Mersey, across the Peak District to Peterborough and the Wash, where it was shipped to Denmark and North Germany.

Mr. Crawford's paper on *Early Bronze Age Settlements* is an interesting illustration of how, by mapping the finds of bronze implements, and gold ornaments, trade routes are established. Sea-borne traffic is shown by the large number of hoards of bronze implements, found near the seacoast, and around the estuaries of navigable rivers. Déchelette proved the same thing in France.

Going right back to Neolithic or perhaps Palæolithic days, we find that flints were mined at Grime's Graves (Grime=the devil) in Brandon and at Cissbury near Worthing, and apparently only roughly chipped there and then exported to be finished elsewhere. They must have been carried along the trackways to the hill forts. These old trackways have interesting names. The Ridgeway comes from Fenland along the Dunstable Downs to Berkshire, the White Horse, and the Marlborough Downs ; there is the Harroway coming from Cornwall, and finding its way through Hampshire to the Thames estuary ; and the Pilgrims' Way, along the southern slopes of the North Downs, was an old road long before men tramped its surface to Becket's shrine at Canterbury.

Here we must attempt to sum up what we have found out about the Bronze Age. The introduction of metal opened up new activities for man, and especially new opportunities for the individual. The Neolithic man toiled with antler pick and shoulder-blade shovel, and piled earth in the banked camps. He chipped sarsen stones, and fidgeted them into the upright position of menhirs and dolmens. It was patient team work in which every one laboured for the community. He needs must move from camp to camp to find pasture for his flocks. In much the same way primitive peoples like the Tasmanians, Australian aborigines, and the Eskimo are fully occupied in hunting to live ; they have not any leisure for fighting, or any possessions to fight for. When everything has to be carried about, the lighter you travel the better.

The earlier round-heads appear to have been powerful,

and may have been a pleasant people ; we have seen that they were buried side by side in the same barrows with the older stock of Neolithic long-heads, and this points to friendly conditions. These early round-heads carried on the building traditions of the New Stone Age ; the hill camps were improved, and they may have had some hand in the completion of Stonehenge, but hardly a trace of bronze has been found there.

As metal began to be more plentiful, larger clearings were made in the forests, and man began to settle down. He could grow more crops and keep more cattle ; he began to have possessions. This was the opportunity for the individual ; if a man was harder working than his fellows or more far-seeing, cleverer or more frugal, he could become a man of property, and, founding a family, become the chieftain. The tribe was gradually forged into a nation, and the chieftain became a petty king.

We may be sure that this wider life brought in its train a set of problems which had not confronted the Neolithic herdsmen. As man began to have more possessions, he became alarmed for the safety of his own, or envious of those of others. The elaborate planning of the later hill forts points to the necessity for being prepared to withstand raids, and it may be that we must look to the Bronze Age for the beginnings of organized warfare.

A people who could plan earth-banks in so subtle a fashion as the entrances of Maiden Castle, Dorchester, give proof of being able to work together, and so may have attempted, in a gradual way, to solve the problem of the right mode of living. Without some code or tradition, the community of a hill fort would have degenerated into a rabble. We shall find as we go along that man is tremendously concerned with this, and seeks many ways for his own government. We shall not be far wrong if we picture the Bronze Age people as living, like the Homeric Greeks, under kings and nobles, yet given some share in the framing of the law.

CHAPTER III

THE EARLY IRON AGE

HERE we must start by another reminder: that at the beginning of the Early Iron Age, which first saw the introduction of that metal, men did not pack up all their old bronze implements and bury them in hoards, to at once arm themselves with iron. It was, on the contrary, a very gradual change over, and for a long time both bronze and iron were used side by side. This was so at Hallstatt in the Noric Alps of the Austrian Tyrol. Here there have been salt mines from the earliest times, and it must have been an important trading centre. Excavations have been carried out in the cemetery of the salt miners, and the implements found there have been held to be distinctive of the civilization at the beginning of the Early Iron Age, when bronze was still in use.

The second half of the Early Iron Age is held to be most typically shown by implements which have been recovered from an old settlement, built on piles, on the margin of a bay on Lake Neuchâtel, near Marin, to which the name of La Tène or the Shallows, has been given. The finest developments of the Early Iron Age are to be found in this country, since it fell under Rome's influence at a later date than the Continent; in the same way the Iron Age, or Late Celtic tradition, survived in Ireland and parts of Scotland which were never occupied by the Romans.

The people of England had become very mixed racially. On page 10 we sketched the order of the arrivals of the different peoples; and just as bronze overlapped the use of iron, so the old peoples carried on their everyday life and were not always exterminated by the new-comers or even dispossessed of their lands. We saw how, in the early Round Barrows, the later round-heads were buried side by side with the earlier long-headed Iberians.

The next arrivals were the Goidels, or first of the Celtic-speaking peoples. On page 14 we mentioned the generally accepted theory that they were driven into the W. by their successors, the Brythons, who were related to them and spoke another variety of the Celtic language. This is now being given up, and it is thought that there were never any Goidels

FIG. 65.—Glastonbury Lake Village.

in England or Wales, but that they went directly to Ireland, the Isle of Man, and Scotland, where their Celtic descendants still live.

The Brythons were followed by the Belgæ, who, while they were responsible for the finest developments of what we now call Late Celtic art, were not themselves of pure Celtic stock. They came from where Belgium now is, and had more Nordic blood than their predecessors ; they were a half-Teutonic and fierce fighting people.

We saw on page 58 how the people of the Heathery Burn Cave were of long-headed stock, which yet had absorbed a Bronze civilization. Much the same thing occurs in the Iron Age at Glastonbury lake village, and we shall base our illustrations of the period on the houses and implements discovered there.

On page 103, Part I., we referred to the Azilian dwellings, built over the water. In Neolithic times this idea was developed, and in Switzerland there were dwellings built on the margins of lakes. They were first discovered at Ober-Meilen, Lake Zürich, in 1853, and this started research, and the discovery of similar structures in different parts of Europe. These may be divided into three types. (1) The Swiss dwellings, built on platforms formed on the tops of piles driven into the lake bed, which date from the Neolithic and Bronze Ages and resembled in form those which are now built by the inhabitants of New Guinea. (2) Another type in which, instead of pile foundations, large open framings resembling log huts were sunk in the lake and steadied by piles, much like the modern caisson used by engineers for foundations. Dwellings of this type were built in France and Germany during the Early Iron Age. (3) The type like Glastonbury and the Scottish and Irish Crannogs. These were really small islands formed in the middle of marshes, and being stockaded around, were raised above the flood-level by earth brought from outside ; but the foundation was quaking bog, which, as we shall see at Glastonbury, gave the inhabitants a great deal of trouble. These date from the Early Iron Age, and continued to be occupied in remote spots, as places of refuge, until the seventeenth century.

As the Swiss lakes became overpopulated, people moved downhill into the Po valley, and here are found the settlements which are called Terremare, from *terra marna*, or marl

Fig. 66.—Hut Interior at Glastonbury.

earth. The peasants discovered that the earth from these old settlements was valuable for agricultural purposes, and in carting it away came across antiquities which disclosed the secret.

There are literary references to lake dwellings. Cæsar said, writing of the Morini (a Belgic tribe in Gaul, opposite Kent): "They had no place to which they might retreat, on account of the drying up of their marshes (which they had availed themselves of as a place of refuge the preceding year), and almost all fell into the power of Labienus" (*Com.* iv. c. 38).

Venice itself, the Queen of the Adriatic, is a glorified crannog which started as a place of refuge. "They little thought, who first drove the stakes into the sand, and strewed the ocean reeds for their rest, that their children were to be the princes of that ocean, and their palaces its pride."

Hereward the Wake maintained himself, in the last stand against the Norman, in the marshy recesses of the Isle of Ely.

Now we come to the interesting way by which we in England came to be provided with a lake village of our own. Mr. Arthur Bulleid of Glastonbury, when he was a young man, read Keller's *Swiss Lake Dwellings*, and was fired with the idea that there must have been a lake village in the olden days in the swamps near Glastonbury. Remember that in this neighbourhood there is the tradition of Arthur and his knights and the Isle of Avalon:

> "The island valley of Avilion,
> Where falls not hail or rain, or any snow,
> Nor ever wind blows loudly."

So whenever Mr. Bulleid went on his walks abroad he kept a wide-open eye for any indications of a possible site for a lake village. This was in the end discovered by the mounds which had been left where the hut foundations were, and though in the course of 2000 years or more the land had been drained, and became covered with vegetable soil and turf, yet these mounds were still noticeable to the observant eye. In the molehills were found pieces of bone and charcoal, and when Mr. Bulleid made a trial hole he came across more charcoal, some pottery, and two oak beams. Again, a labouring man, David Cox by name, told Mr. Bulleid that when he had been cleaning out a ditch about three-quarters of a mile away, in 1884, he had found a black oak beam embedded in the

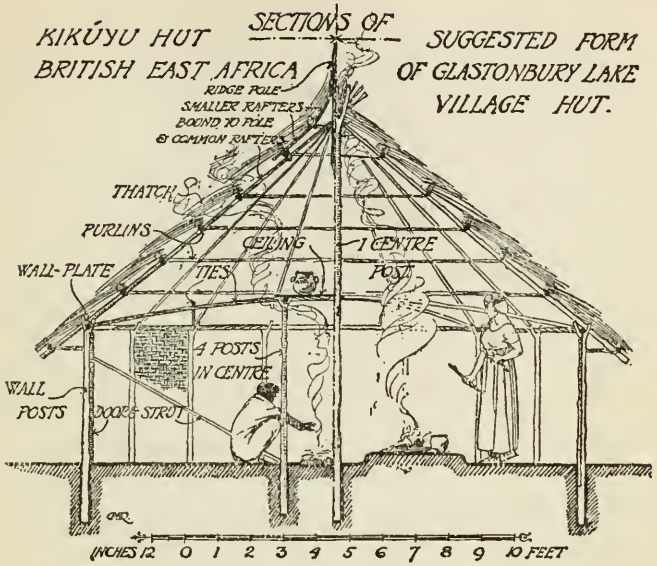


FIG. 67.—Hut Sections.

soil, and had to cut a piece off it to widen the ditch. Cox reported that this beam looked like the end of a boat, and this is what it turned out to be, and it is shown in Fig. 69. So Mr. Bulleid's dream had come true, and he had found his lake village. Excavations were started in 1892, since when the village has been thoroughly explored, and in 1911 a splendidly detailed account was published in book form by Mr. Arthur Bulleid and Mr. Harold St. George Gray. Boys and girls should endeavour to see these volumes, which are models of how such work should be done.

Fig. 65 gives a bird's-eye view of the village. The area was about 10,530 square yards, and the foundations of the enclosed space were reinforced with layers of logs, laid down crossways, and filled in with brushwood, stones, and clay, but it could never have been what the land agents describe as a " desirable building site." During the time that Glastonbury was occupied, a bed of peat accumulated in some places 5 feet thick, and the inhabitants were constantly rebuilding.

The village was palisaded around, with piles driven into the peat, and filled in with wattle and daub. This method was also used in the construction of the huts—there were 80 to 90 of these, roughly circular in shape, and varying from 18 feet to 28 feet in diameter ; they may not all have been houses ; some were probably used as barns or workshops. The huts contained a central hearth, as Fig. 66, of flat stones let into a clay bed, and as many as 9 or 10 hearths have been found added one on the top of the other, as the foundations settled down into the bog. The wattled walls of the huts were daubed with clay ; this is known because pieces of clay showing the marks of the wattles were discovered in the excavations. Each hut had a central pole or roof-tree, than this we can gather little more.

We have to look to a primitive people, then, to find parallel building traditions. The Akikúyu, of the Kikúyu hill country, in British East Africa, build to-day, and live in houses which must be the living spit of those at Glastonbury. Fig. 67 shows these on the left hand-side of the section, and on the right is the suggested form of the Glastonbury hut. We have made this drawing from the plan and carefully detailed particulars in Mr. and Mrs. Routledge's book, *With a Prehistoric People*. It is an interesting fact that the constructional problem which the Akikúyu have to face, when they build their huts, is similar to the one which confronted Wren when he designed the dome of S. Paul's Cathedral.

We have seen how Neolithic man built little houses with rafters leaning against a central pole, and this was a very sound method. So long as the feet of the rafters were firmly fixed into the soil, the house stood firm, in gales and under a load of snow ; the drawback was that there was no headroom around the walls, and so one had to sit there as you do now in a bell-tent. A wall was raised around to give headroom, as Fig. 19, and this was satisfactory so long as the wall was built of stones heavy enough to provide a sufficient abutment for the thrust of the rafters. The trouble came when the same idea was attempted with thin wooden walls, which would have been overturned.

The Akikúyu first set up about 19 forked posts in holes dug in a circle of about 15 feet diameter. To appreciate the cleverness of the construction, you must remember that none of the wood is bigger than a man's arm. Four posts

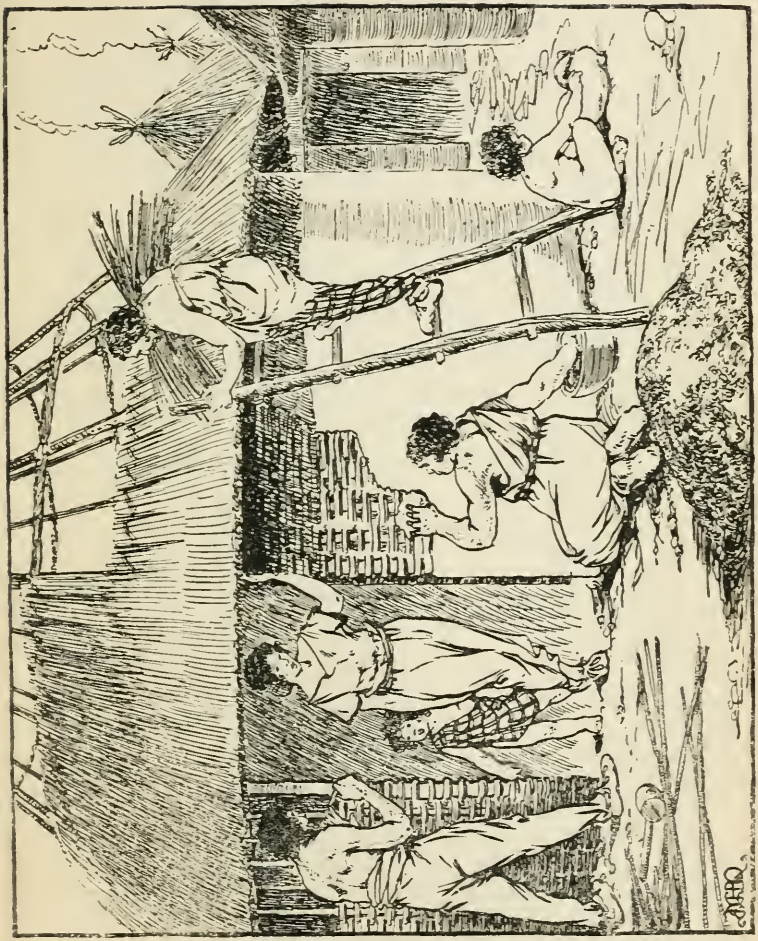


Fig. 68.—Building a Hut at Glastonbury.

are set up on an oblong in the centre about 4 feet 6 inches by 3 feet. Around the tops of the outer posts, long pliant rods are woven, and these form the wall plate, and take the thrust of the roof. Again ties are woven from this wall plate across from side to side, picking up the tops of the centre posts on the way. Wren took up the thrust of the brick cone which supports the dome and lantern at S. Paul's, by an iron ship's cable, which was let into the stone, and run in with molten lead. We think the rest of the construction of the Akikúyu hut is explained by the drawing.

At Glastonbury there were also found remains of an earlier type of hut, built with wall plates resting on the tops of piles driven into the peat. The huts were apparently oblong in shape, with hurdled walls mortised to the wall plates. Of these we cannot attempt any reconstruction, but of the circular huts we can be more sure, and it seems fair to assume, from what we know, that they resembled those of the Akikúyu.

This building in wattle and daub continued as a tradition in Glastonbury. William of Malmesbury, writing in the twelfth century A.D., mentions the "Ealde Chirche," the ancient church of S. Mary of Glastonbury, built in the seventh century of wattlework.

We know that the Glastonbury people used canoes, for one was found by David Cox, to which reference has been made, and some form of canoes would have been absolutely necessary to the inhabitants of the village. Judged by the peat deposit, all this district around the river Brue must have been a vast morass in the olden days, and in times of flood an inland sea. The canoe (Fig. 69) is of the greatest interest, about 18 feet long; the flat bottom is 2 feet wide, 10 feet from the prow, and its maximum depth inside is 12 inches. It is becoming boat-like, and shows a notable development on Fig. 6, having a shapeable prow, and a graceful rise, or sheer, at bow and stern. The lake villagers had a landing-stage and dock attached to their home, with vertical walls made of stout grooved oak planks driven into the peat, into which were fitted horizontal boards, as Fig. 69. We know they went fishing, because lead net sinkers have been found. Their canoes would have been used to take them to their cornfields on the mainland, the island village had no room for these. Fig. 70 shows a piece of timber found at Glastonbury, and shaped in such a way that it is thought it

FIG. 69.—Dug-out Canoe and Landing-stage at Glastonbury.

FIG. 70.—Ploughing.

may have been used as a hand plough, but we are very doubtful of its suitability for this. Many querns and millstones have been found: the earlier type as Fig. 22, and the later rotary types as Fig. 71. In these the lower stone was fixed, and had a wooden pivot in the centre. The top stone was fitted over this, and corn fed through the hole, made large enough to allow it, passed down, and was ground between the upper and lower millstones, coming out at the sides as flour. Small cakes were found at Glastonbury, made of unground wheat grains which had been mixed probably with honey and baked.

FIG. 71.—Grinding Corn.

The villagers also owned horses; many harness fittings have been found, bits, and the wheels of chariots. Whether the horses were transported to the mainland on rafts or stabled there we cannot be sure. In the summer they may have been pastured on the mainland, within the protection of a camp, and in the winter ferried across to the village to share the huts with the inhabitants. The people doubtless

FIG. 72.—Smelting Iron.

used their canoes to carry on trade with the surplus goods which they manufactured and wished to exchange for other commodities. The two iron currency bars found point to this (see p. 112).

When we pass to the life carried on within the village, we have proof of many and varied activities, but it will perhaps be well to start by a description of the iron working, which gives the period its name.

Fireclay crucibles have been found at Glastonbury, and funnels (*tuyère*) for conducting the blast into the furnace, but it is thought that the crucibles were used for melting copper and tin, to make bronze, as described on page 54.

So far as iron working was concerned, it is probable that this was carried out as the present-day smelting operations of the Akikúyu of British East Africa, which we have shown in Fig. 72. The iron ore is collected from surface workings in the form of an iron sand ; this is washed to get rid of the clay and other substances, so that the iron grains are left. The furnace consists of a kidney-shaped hole in the ground lined with clay. The ore is placed in the pit of the furnace, and a charcoal fire started, then more ore and charcoal are added as needed. The blast is introduced at one end of the furnace, which is slightly lower than the middle, by means of a fireclay funnel (*tuyère*). In the funnel are introduced the wooden pipes of the bellows, which are in this way protected

FIG. 73.—Saw and Adze.

from the fire. Two bellows are used, of goats' skins sewn into the shapes of rough cones, or fools' caps, the pipes being attached to the small ends. At the larger ends of the bellows, which are open, are fitted two short sticks, sewn to the skins, but leaving one-third of the circumference free. The smiths' boy holding the two sticks of the two bellows, two in each hand, opens first one bellow, as if the sticks were hinged at one end, and then the other, and closing the opening by shutting his hand, depresses the sticks, and kneads the

FIG. 74.—An Iron Knife.

ends of the bellows, sending forward a continuous blast into the furnace. This blast raises the temperature of the furnace, just as a fire is brightened up by ordinary bellows.

The ore is reduced to a sticky mass rather than molten metal; furnaces which will generate a sufficient heat to make the metal flow, only date from the seventeenth century, and we do not find any cast iron before then. The lump of iron is left in the furnace overnight to cool, and then turned out in the morning, and broken up into sizeable pieces which are forged up into ingots or blooms. This iron is very pure, and ductile, and so can be readily forged; being smelted with charcoal it is free from the sulphur which comes from coal when it is used, and which makes the iron short and brittle. The fireclay crucibles we have referred to were buried in a hole in the ground, and the fire and blast arranged as in the case of the iron smelting.

FIG. 75.—Bronze Finger-ring.

In Messrs. Bulleid and Gray's book are shown illustrations of all the finds in the excavations, and here we can see daggers, spear-heads, swords, knives, bill-hooks, sickles, saws, gouges, adzes, files, bolts, nails, rivets, keys, and bits. The weapons are few and far between, and this is perhaps one of the reasons the villagers fell an easy prey to their enemies in the end. The man in Fig. 66 is holding an iron bill-hook in his hand, of a quite modern shape; and Fig. 73 shows one man using a curiously shaped saw, with the teeth arranged so that it cuts on the up-stroke, while the other has an adze, which is first cousin to the axe. Fig. 74 shows a man using a particularly beautiful iron knife found at Glastonbury.

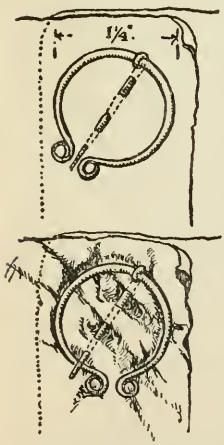


FIG. 76.—Penannular Brooch.

Leaving iron working, we can turn to bronze, which still continued in use in the Early Iron Age as it does to-day.

Fig. 75 shows a bronze finger-ring, and Fig. 76 a penannular (almost a ring) brooch. The top drawing shows how

the pin, which was loose on the ring, was pushed through the material, and then fastened by moving the ring round a little, and clipping it under the pin. This form of brooch was the forerunner of the buckle.

Fig. 77 shows three bronze brooches, or *fibulæ*. These fastenings came into use in the Swiss and Italian lake villages when cloth was first woven. The three examples drawn here, show the development of these pretty little things, which the archæologists associate with the lake village of La Tène, on the lake of Neuchâtel, and are called types 1, 2, and 3, though only type 2 occurs at La Tène itself. In No. 1 the foot is bent back until it touches the bow of the brooch. In No. 2 the end is no longer free but actually attached to the bow, and in No. 3 the foot and bow are designed as one.

On the right-hand side of Fig. 77 we have drawn the development of the springs of these brooches, and in each case the pin of the brooch is shown vertically. In those of Hallstatt the springs are on one side of the head; those of La Tène are bilateral. No. 1 shows the earliest type, like that of a safety-pin of to-day; so our old friend is of ancient descent. No. 2 has a double coil; and in 3 the pin has one coil to the right, and the wire is then carried to the left, where, after a treble coil, it swings up to form the bow of the brooch. In 4 there is a double coil on one side, and in 5 a treble coil, but the tension is increased by the ingenious way in which the loop or chord across is taken under the arch of the bow; the whole pin—coils, loop, and bow of the brooch—being in one unbroken length. In 6 we have pin and coils to the right, the loop or chord and the coils on the left in one piece; but the bow is a separate part which is hooked under the chord. No. 8 is on the same principle, but the spring is covered with a metal sheath attached to the bow. In 7 the bow is fixed on to a smaller loop. We consider these springs of the greatest importance: 1 dates from perhaps as early as 1400 B.C., and 8 takes us up to the Roman occupation, and, so far as we know, 1 is the first application of the spring. The old brooch-maker who, in 1400 B.C., tapped his bronze wire around a rod and discovered the spring, would have been rather surprised if he could have looked into the future and seen the many ways to which his invention would be applied; for example, that we should tell the time by little spring-driven machines, which we call watches.

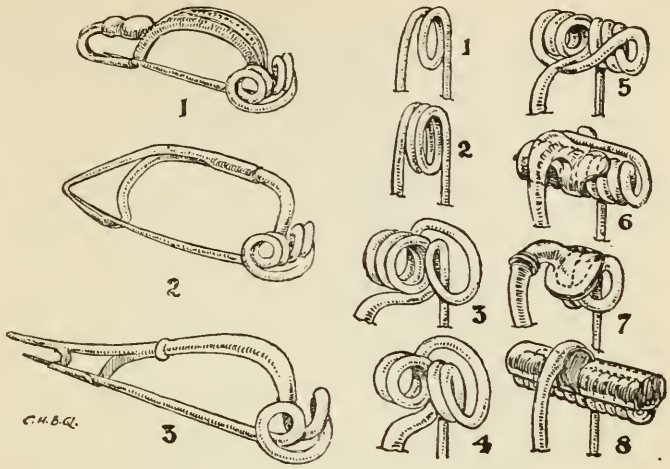


FIG. 77.—Brooches and Brooch Springs.

There were excellent potters at Glastonbury, and Fig. 66 shows some of the pottery found there. The greater part of it appears to have been hand-made, as described on page 26, but the very beautiful pot in the foreground has been turned on some sort of wheel. We saw (p. 25) how the Akikúyu build up their pots on a pad of leaves, which makes it possible to turn the pot round as it is being made, and it is probable that the potter's wheel was preceded by a turn-table, on the lines of the rotary quern (Fig. 71). If a heavy block of stone or wood were pivoted in this way, its weight would aid the momentum of its spin and be very helpful in making pottery. This early type is suggested at A, Fig. 87.

SPINNING AND WEAVING

Spinning and weaving were carried on in the village, and the spindle whorls and loom weights suggest that this work was done as already described on page 60.

TURNING

There were expert coopers at Glastonbury, who knew how to build up tubs with wooden staves and hoops. They were

good turners. There is a turned bowl, shown in the lower right-hand corner of Fig. 66, which was decorated in addition with a beautiful running pattern cut in an incised line. There is no evidence of what the Glastonbury lathe was like, but Fig. 78 shows a very primitive type in one in the Chilterns, called the Pole Lathe. It is difficult to see how anything could be simpler than this, and it is obviously a development from the Bow-drill shown on page 73, Part I. In the Chilterns the men who make chair legs buy a fall of beech in the woods, and to save cartage build themselves little huts and turn the chair legs there. The supports for the lathe are often two trees growing close together, which they cut down at a height suitable for the two planks forming the bed of the lathe, into which the poppet heads are fixed. A third sapling is bent down, and the cord, which is to supply the "power," is fastened to this, passed around the chair leg, and connected to the treadle under. A rough tool-rest is provided. The turning is done on the down stroke, which revolves the chair leg towards the turner, and when he takes the pressure off the treadle, the pole pulls it up again ready for another cut. The work proceeds very rapidly, and we have seen chair legs turned, one in a minute.

In our sketch we have shown the turner making a wooden bowl, like the ones which were used before the days of enamelled iron. The block of wood was placed directly against one centre of the lathe, and on the other side came a circular piece of wood, around which the cord was passed; this was put on to the other centre of the lathe and fixed to the block for the bowl by four brads. This, we think, shows that the so-called Kimmeridge Coal-money is the core left from turning shale bracelets on pole lathes. Coal-money is found near the Kimmeridge shale beds on the Dorset coast, and consists of circular discs, having a hole on one side, and a square recess or two or three smaller holes on the other. The diagram at the bottom of Fig. 78 shows how we think a shale bracelet was turned on a pole lathe. AA are the poppet heads, and BB the centres, C is the circular piece of wood around which the cord was passed, fitted on to one centre, and let into one side of the piece of shale, in a square recess, or by two or three separate pins. The shale being in contact with the other centre. The turner trued up his bracelet, and set its outside shape first, and then making a

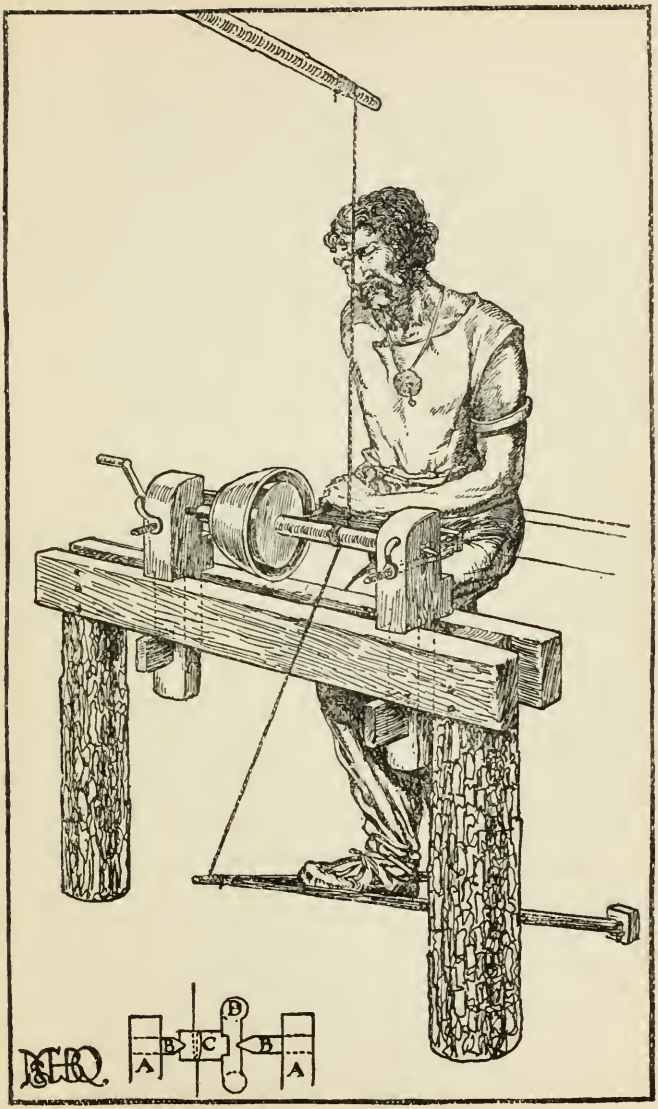


Fig. 78.—A Pole Lathe.

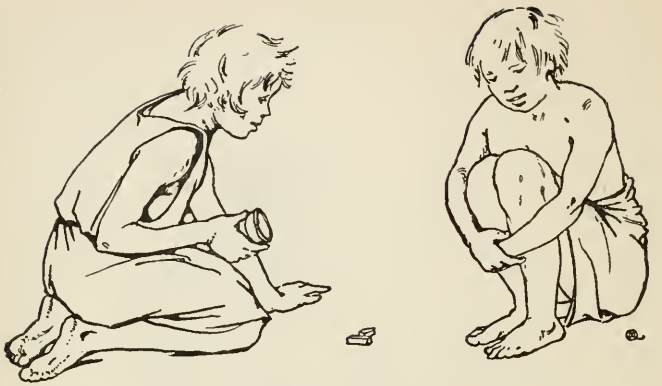


Fig. 79.—Dice.

cut on each face, finally detached it as dotted line D, and the Kimmeridge coal-money was the useless core, and never used as money. One great advantage of these old pole lathes was that the turner could make two or three bowls in graduating sizes from the same block of wood.

The Glastonbury carpenters used axes, and we do not realize in these days what a useful tool this can be, that is, if you are a craftsman and not a wood butcher. Alex. Beazeley, a pleasant architect, and most architects are pleasant, wrote in 1882, that the Swedish carpenters at Dalcarlia and Norrland, "require no other tools than the axe and the auger, and despise the saw and plane as contemptible innovations, fit only for those unskilful in the handling of the nobler instruments: they will trim and square a log forty feet long as true as if it had been cut in the sawmill, and will dress it to a face that cannot be distinguished from planed work." As we jog along we shall find the truth of this, that so long as man is master of his tools we get good work, but when the machine masters the man we have indifferent results.

Fig. 79 shows that there were bad boys at Glastonbury, or perhaps men, who gambled with dice.

The form of lake villages suggests that they were built by timorous people, living in fear of fiercer neighbours. They appear to have had their beginnings with the long-headed Mediterranean race, or Iberians of the New Stone Age. This

is borne out at Glastonbury. The burial-place of the inhabitants has not been discovered, but during the excavations human remains were found of this old Iberic type, which, here in the W., had lived on, and kept themselves free from intermarriage with the round-headed invaders of the Bronze Age. They were small and dark—5 feet 3 inches to 5 feet 8 inches in height. Oval-headed, with a cephalic index of 76, which makes them of mesaticephalic type (see p. 24, Part I.). The same race lived at Worlebury Camp, at the W. end of the trackway on the Mendips, and in Romano-British times in the villages of Woodcuts, Rotherley, and Woodyates, in Cranbourne Chase, down to Saxon times.

At Glastonbury their fears held true, and some little time before the Roman occupation, final disaster descended on the village, and they were put to the sword: perhaps by the Belgic invaders, who were long-heads, but of an altogether tougher fighting breed. Cæsar (*Com.* v. c. 43) tells us how the Nervii, when attacking Cicero's camp, set fire to the thatch of the huts, by discharging redhot clay sling bullets. Many of these were found at Glastonbury, and help us to visualize the final scene. We have noted that very few arms were found in the excavations, and the little dark men only wanted to be left quietly alone, and be allowed to get on with their work; and this is what they did until they were discovered. Then their outlying possessions and crops would have been destroyed and the village surrounded. The Glastonbury men could only have watched the scene, in shuddering misery, from behind their stockades, and then the invaders, using perhaps the dug-outs they had collected from the waterside, would have paddled across the lake, and discharging their redhot clay bullets have fired the thatch. When the flames subsided, the few survivors would have been put to the sword. Yet the little dark men have had their revenge; from the very start of their career they appear to have lived in communities; it may have been a tradition they brought with them from the shores of the Mediterranean. The Belgæ who oppressed them, like the later Anglo-Saxons, whom they resembled, preferred a more open-air life, and today their fair-haired descendants have the same tastes.

Prof. Fleure, in his paper on the *Racial History of the British People*, sums up the matter thus: "These descendants of the Neolithic people are the long-headed, long-faced, dark-haired,

FIG. 80.—Coracles.

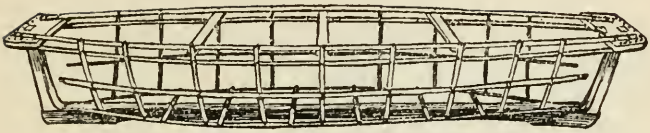


FIG. 81.—Framework of Umiak.

brown-eyed people that form so strong an element of the population of big English cities. They seem better able than all other types to withstand slum conditions, so that in the second generation of great city life they have arisen in their millions to form once more, after many days, almost a majority, perhaps, of the population of S. Britain." So the tale of the Iberians is not yet completed.

We have seen how fond the ancient Britons were of wattle-work, and on page 90 how it was used even for the construction of churches. Boats were made in this way, and Fig. 80 shows a coracle, of which the wattled framework was covered with hide; coracles are still in occasional use by fishermen on Welsh rivers. Primitive peoples frequently make boats in this way. Fig. 81 shows the framework of the Umiak, or women's boat of the Eskimo, made of driftwood, laced together with thongs,

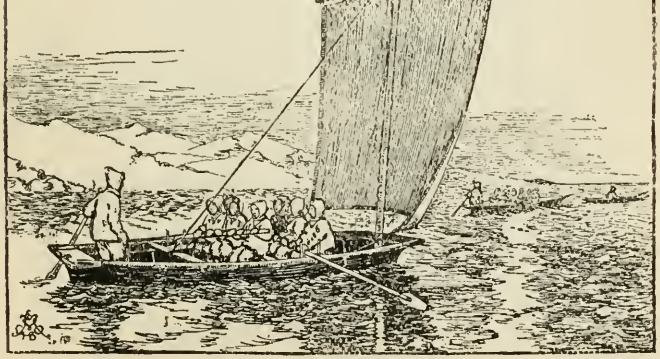


FIG. 82.—Eskimo Umiak.

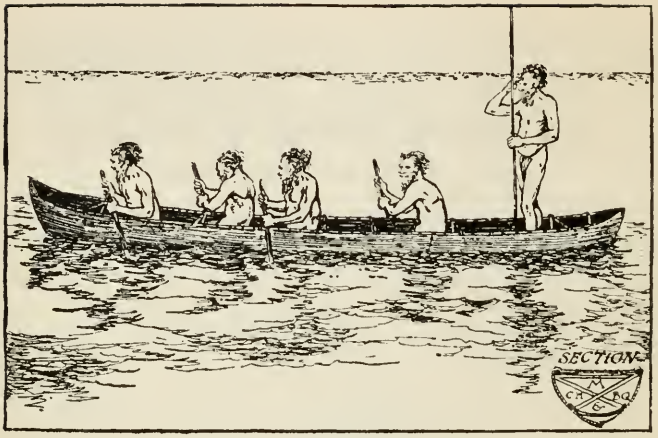


FIG. 83.—A Sewn Bark Canoe.

without a single nail, and covered with skins; and Fig. 82 how it is fitted with a mast, and square sail of membrane. Fig. 83 is an interesting canoe made by the Australian natives, with bark sewn on to a framework. Fig. 84 shows swords of the Early Iron Age. No. 1 shows an early Halstatt pattern, and 2 a later La Tène type shown in scabbard. The scabbards were in bronze, and frequently ornamented with very beautiful designs. The sword blade was of iron, with a tang on to which was fitted a bronze mount to the handle, the latter formed of bone or wood threaded on to the tang.

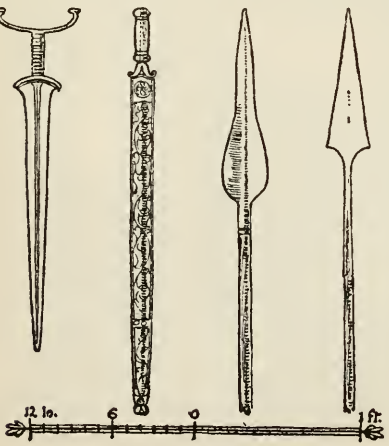


FIG. 84.—Early Iron Age Swords and Spears.

Fig. 84 also shows two iron spear-heads of the same period which are rather different from the leaf-shaped patterns of

the Bronze Age. The shields were now oblong in shape, as that of the Belgic man in the costume plate (Fig. 56). This splendid work of art can be seen at the British Museum, and is made of bronze decorated with enamels. This form of decoration appears to have developed out of the use of coral, added as an ornament to bronze. Then Early Iron Age metalworkers made studs, with an enamel surface, and pinned these to the bronze. This led the way to the crowning glory of his work, Champlevé enamelling. Here the field of the design was graved out of the metal, and the ground being first scored to give a key was filled in with the fused enamel, which, being polished, was finished flush with the face. Fig. 85, of an enamelled harness ornament, shows to what mastery of line the designers had now advanced. Think of the splendid appearance of an Early Iron Age chieftain ; his helmet, shield, and horse-mountings all bronze, not dull as now but shining like gold, with the enamels afire like liquid rubies. The earliest enamels were of one colour, red.

FIG. 85.—Enamelled Harness Ornament.

In the Early Iron Age, costume had developed and weaving in brilliant colours was practised. It is thought that these were combined into primitive tartans. As in the Bronze Age, a piece of material was folded around the body, in the form of a kilt, and this with a sleeveless vest, and a cloak which was semicircular in shape, completed a man's attire. The shoes were cut out of hide, with straps attached, and gathered round the ankle. The Brythons appear to have introduced the loose trousers, which originated with the Persians and Scythians. The women wore a long tunic reaching to the ankles, with short sleeves. Women, men, and horses, all alike, wore beautiful torcs, belts, and brooches, of bronze and enamel.

Another thing which was not found at Glastonbury was the burial-place, so that we do not know what objects they buried with their dead ; fortunately for archæologists, there are many other Early Iron Age cemeteries where this information can be gained. A very important one is at Arras, near

Fig. 86.—The Bronze Mirror.

Market Weighton, East Riding; here the barrows are small, circular in form, not more than 2 feet high by about 8 feet diameter. The body was not cremated but buried in a very contracted position in a cist, or grave cut in the chalk. The skulls show the people to have been long-headed (*dolichocephalic*), and here for the first time iron is found with the body. This means either that there had been a reversion to the old burial customs of the Neolithic people, or these were introduced afresh from the Continent; in any case the cremation of the Bronze Age passes away. Again, the long-headed skulls may point to a survival of Neolithic people, who had absorbed the old round-headed Bronze Age invaders, or to fresh invasions from the Continent. Some of the barrows at Arras, and in Yorkshire, were found to contain the remains of chariots, and these resemble the chariot burials in France; this rather points to the Yorkshire barrows being the work of invaders. The tyres of the chariots there are about 2 feet 8 inches in diameter, and parts of the oak rims, or fellies, were found, mortised for as many as 16 spokes. There were nave collars, for the hubs, of iron plated with bronze, and the skeletons of horses of about 13 hands. We saw the beginnings of chariots at Heathery Burn Cave in the Bronze Age, and it is obvious that by the time of the Early Iron Age these played an important part in everyday life. We have attempted a reconstruction in our Frontispiece, Fig. 1. Many of the Yorkshire barrows suggest that women were buried in them. In one was found one hundred glass beads of a beautiful deep blue colour, ringed and spotted with white; others were of clear green glass with a white

line. There were rings of amber and gold, and bracelets of bronze.

In the mounds were broken pottery, and the bones of animals, and charcoal, as if there had been a funeral feast. An iron mirror was found at Arras, very much rusted of course. Fig. 86 shows one of bronze of a more usual type.

We can now pass on to the latest type of burials in this country, and there is but little doubt that these were the work of Belgic invaders. They were discovered in 1886, at Aylesford in Kent. This was in the Belgic country, and here we find that cremation had again been introduced, and the Belgæ appear to have maintained this custom.

The cist, or grave, covered by a barrow, had passed out of fashion, and its place had been taken by a circular pit, about 3 feet 6 inches deep, the sides and bottom of which were daubed with chalky clay. In the pit were found burnt bones, and the fragments of the pottery cinerary urns, in which there had been placed a pail, flagon, skillet, or shallow saucepan, and brooches all of bronze. The custom evidently still persisted of burying objects which had belonged to the dead, because it had some symbolical meaning ; or for their use in the spirit world ; or because it would have been unlucky to retain the objects in everyday use. The pail is of the type carried by the Belgic girl in the costume plate (Fig. 56). The flagon of a very beautiful shape must have been imported from Italy.

The Aylesford pottery marks a great advance. It is of very graceful shape, and must have been turned on a wheel, and given a lustrous black surface in the firing. The wheel may have been of the turn-table type described on page 97, and shown at A in Fig. 87, or the potters may have advanced so far as the wheel shown at B. This is a very primitive type, which was used until lately for making flower-pots and bread-pans.

Except for this important detail of the reintroduction of cremation, the Belgæ do not seem to have effected any very great alteration in the everyday life of the times. They were a fierce fighting people, and conquered the S.E. districts. This gave them possession of the iron mines of the Sussex Weald, which was to be the Black Country of England until the eighteenth century.

The Brythons and the older Goidelic stock of the Bronze

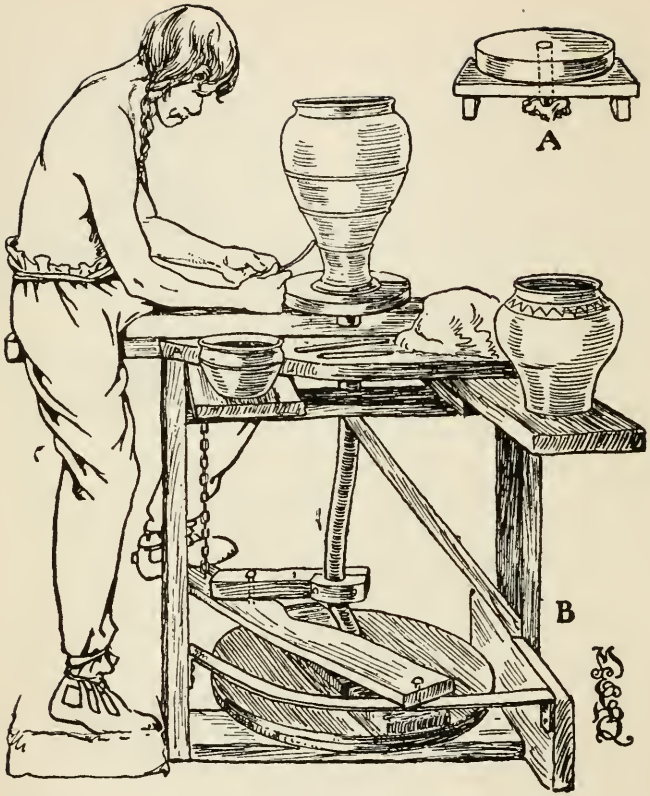


Fig. 87.—A Potter's Wheel.

Age, and the people of Iberian descent as at Glastonbury, learned to use iron but continued to live their lives in their own way. Fig. 88 illustrates the use of bronze bowls as water-clocks. These were put to float in a larger bowl, and being perforated at the bottom, slowly filled, and in a certain time sank, and were then emptied by an attendant and refloated, to re-sink in another period. Fig. 89 shows late Celtic ornament. We saw by Fig. 61 how the Bronze Age peoples' patterns were chevrons, lozenges, and concentric circles, and the Early Iron Age saw the introduction of the

curve, and the endless possibilities which come about through combination of curves.

Leaving the smaller works of man, we find that the old hill forts were not yet abandoned: Worlebury, at the W. end of the Mendips; Hod Hill, near Blandford; Bigbury, on the Pilgrims' Way; Winkelbury, S. Wilts; Mt. Caburn, Lewes; and Cissbury, near Worthing, have all yielded Late Celtic remains, and the trackways between the hill forts had developed into an entirely adequate road system. We do not mean by this macadam surfaces, granite curbing, and paved footpaths; the roads would have been well-worn grass tracks on the high lands, with stone cobbles perhaps in the marshy places.

FIG. 88.—Water Clock.

Just as we were finishing this book, we came across *Early British Trackways*, by Mr. Alfred Watkins, and we recommend this to our readers as containing an idea of the greatest interest. The book came about, because Mr. Watkins' attention was attracted by a straight line on a map, which appeared to pass through a certain class of objects. On exploration it was found that this line consisted in parts of old trackways which at one time had linked up places on the line. Having got the idea, Mr. Watkins proceeded to test it wherever possible. Taking the 1-inch scale ordnance, he selects barrows or tumuli, castle mounds or camps, standing stones and menhirs, churches and wayside crosses, and sticking a pin in the map on one, the game is to see how many places can be found on a line; when there are not less than four, the actual country is surveyed, when, more often than not, a piece of modern road may farther along become a grass track, and then be lost in ploughed land, to reappear beyond as a footpath. This at once fired us, and out came our maps. We found that from where the Ridgeway and Fairmile descend the Berkshire Downs, and come down to

the Thames by the Ferry at South Stoke, if a straight line is drawn on the map, from the trigonometrical station of the Ordnance Survey on White Hill 293 above the Ferry, to the camp at Ravensburgh Castle in the parish of Hexton in N. Herts, about 40 miles away, it picks up many interesting points. There is another trigonometrical station on Harcourt Hill 610, then Whiteleaf Cross cut in the chalk near Monks Rizborough and the mound on Pulpit Hill. From Beacon Hill above Aston Clinton you look down on The Moat at Pilstone as a reflection point at a lower level, and to the N.E. can see Icknield Way coming over the shoulder of Beacon Hill at Ivinghoe. Then, again, the Five Knolls tumuli by Dunstable point the way to Ravensburgh Castle, and Icknield Way meanders along the escarpment of the Chilterns, sometimes on the line and sometimes a little below it.

It can hardly be coincidence, which, though its arm be long, could scarcely stretch for 40 miles and put so many points on the same straight line. With some experience of land surveying, we think we should find it a very difficult matter to lay out such a line, up hill and down dale, over 40 miles of country, of so diverse a character as the Chilterns; and this is what these old road surveyors seem to have done. If this was the case, then we have to accept the fact that long before the Romans there were men laying out roads by very much the same methods as the Royal Engineer surveyors of the Ordnance Survey; so much was this the case, that when we came to make our own survey we accepted the view-points of prehistoric man as being suitable for trigonometrical stations.

It is just one more illustration, which goes to prove that when we think of prehistoric men as just so many roving barbarians we are hopelessly out of touch with truth.

As the trackways were developed, and people were better able to travel, the tribal centres grew into the capitals of kingdoms, the chieftains became kings. Camulodunum, or Colchester, was the chief town of the Trinovantes; Verulamium, or St. Albans, of the Catuvellauni, and Cassivellaunus was their king. Cæsar is supposed to have referred to St. Albans, when he wrote of "an oppidum with the Britons is a place amidst dense forest, fortified by a rampart or ditch, whither it is their habit to assemble to escape an enemy's raid." Corinium (Cirencester) was the home of the Dobuni;

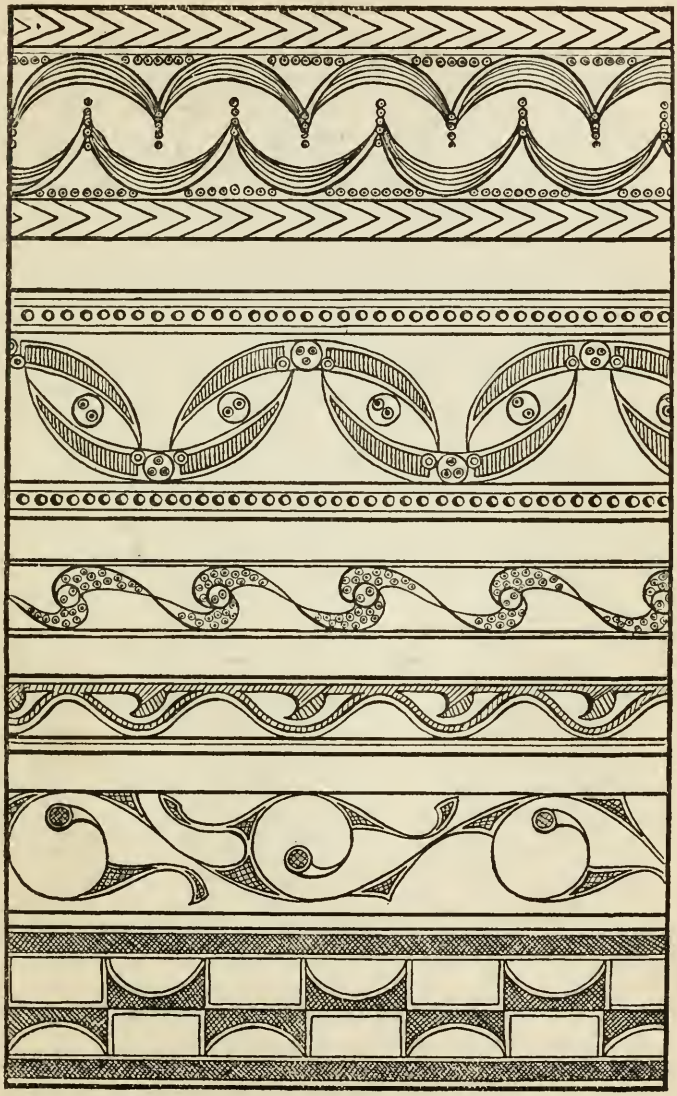


Fig. 89.—Late Celtic Patterns.

Calleva (Silchester) of the Atrebates ; London of the Cantii. Women were allowed to be Queens. Cartismandua was Queen of the Brigantes, and their country was the Pennines, and Boudicca (Boadicea) of the Iceni.

In the Bronze Age chapter, we discussed Trade and Traffic on page 76, and this brings up the question of money or the currency which is used as a medium for that exchange of goods, which is the basis of Trade. It has been suggested that the gold bracelets of the Bronze Age may have been used as money ; these have been found with rings fastened to them, and are called Ring-money, and the idea does not seem too wildly remote. This is hardly the case with Fig. 90, which illustrates iron currency bars, and we can imagine our readers, unless they are born financiers, saying, " How on earth could anyone buy anything with a sort of iron walking-stick." We are quite sure that many boys and girls have been puzzled by the various methods which have been adopted by different peoples. There was the British sovereign of gold now unhappily extinct ; its dirty greasy successor, so typical of the time, the Treasury note ; one has heard of cowrie-shells, and so on ; in all parts of the world different things seem to be used, but none so odd perhaps as the iron bars of the Early Iron Age.

Of the two currency bars found at Glastonbury, one is $27\frac{7}{8}$ inches long, and weighs 4666 grains, the other, $21\frac{1}{4}$ inches, but much thicker than number one, weighs 9097 grains. Mr. Reginald Smith has identified currency bars with the *talecæ ferrecæ* of Cæsar (*Bell. Gall.* v. 12), and it is thought that there were six varieties, the British unit being about 4770 grains. Bars of $\frac{1}{4}$, $\frac{1}{6}$, 1, $1\frac{1}{2}$, 2, and 4 have been identified. The map (Fig. 3) shows where bars have been found in England, and is a proof of the wide distribution of trade even in the Early Iron Age.

Perhaps we can give an illustration which will show how these things become accepted as currency. In remote villages in this country in pre-war days, it was usual to have a settling-up day once a year after harvest ; during the rest of the year the people ran bills, which they chalked up on the barn-door. At settling time the farmer would go to the miller and say, " How do we stand," to which the miller replied, " I have ground your corn, but you had some of the flour, and I sold the remainder, and owe you £5." The miller

FIG. 90.—Currency Bars.

went to the baker who said, "Yes, I had my flour from you, but supplied you with bread, and owe you £5." The butcher bought his beasts from the farmer, but sold his meat to all the village, and so they weighed up the matter, and came to a settlement. It is quite conceivable that the same £5 note, with a little small change, would have passed from hand to hand, and enabled the village to start on another year's trading all square; if instead of the £5 note, you had an iron bar, it really did not matter so much—in fact it was rather better, because like our extinct gold sovereign, it was a thing of value itself, which is more than can be said of the Treasury note. Intertribal and international trade, though more complicated, was, and still is, conducted on this same basis, of the exchange of commodities. It is well to remember this, when so large a part of what is called business to-day is in reality only a gamble with the product of other men's labour. Real wealth springs from mother earth, and real work is to be engaged in winning or shaping her treasures.

We find a less extraordinary currency than the iron bars, about 150 to 200 B.C., in a British gold coinage of modern type of two values. This appears to have started in the S.E., and as some of these coins are inscribed, it shows that writing had progressed.

The unit system of the currency bars is proof of some system of weights and measures, and another is given by the beautiful pots, bowls, and metal work. A good craftsman does not make a thing to just any odd size. Use will have shown him what is the handiest weight, and the best size. A

modern brick, for example, is of the size and weight that experience has shown the bricklayer can handle. Endless experiment has gone to prove this, and all the other details of everyday work and the tallies or the sticks, which were kept as a reminder, became in time recognized standards and measurements.

The currency bars are proof of the exchange of commodities, but do not help us to understand how values were fixed ; how much corn a plough was worth. With such necessaries of life, the plough was worth the extra amount of corn the farmer could grow by its use ; that would be its just price in theory. In practice it is often regulated by scarcity, which tends to increase the price of the plough, or by overproduction, when the price of ploughs goes down. Then there are luxuries, for which people will pay more than they are worth, because they are beautful, or very scarce, and so on. All this wants to be borne in mind ; we shall find how in the Middle Ages, Canon Law was very much concerned with the Just Price and Usury, and even to-day a Profiteer is not held to be a very pleasant person. Trade and currency bars ; weights and measures ; the honesty of the good man, and even the thieving of the rogue, are part of that wonderful peep-show into the past we call History, and cannot be neglected.

Now as we are approaching the end of our space, it may be as well to see if we can discover anything of the animating spirit which inspired these people, and gave savour to their everyday life. We saw in Neolithic times how men are thought to have worshipped the powers of Nature, with a great Mother God over all. Gildas, a monk, writing in the sixth century A.D., said : "Nor will I cry out upon the mountains, fountains, or hills, or upon the rivers, which now are subservient to the use of men, but once were an abomination and destruction to them, and to which the blind people paid divine honour." Yet Nature worship still lingers with stones which are lucky, and wells whose waters are curative.

Sun worship appears to have been typical of the early Bronze Age, and with the arrival of the Celts may have taken the form of Hero worship. It is probable that in the Early Iron Age, as the gods became more personal and intimate, they took to themselves as well the failings of man ; as they were stronger and braver than man, in the perpetual warfare they waged with the powers of darkness, so also they were more cruel and hard.

Druidism appears to have been the religion of the later Celtic tribes of Britain and Gaul, but doubtless it was grafted on to the Hero and Sun worship of the Bronze Age, and the older Nature and Moon worship of the Iberians. This has been a very general practice ; a conquering people would be willing to place the credit of the victory to the power of their own gods, yet unwilling to neglect the ones who had been overthrown. A god was a god, even when associated with defeat, and might easily revenge himself by alliance with the powers of Darkness. It was wiser then not to run any risks, so we find old Faiths adapted to New Religions.

Cæsar in *De Bello Gallico*, book vi., gives us an interesting picture of Druids and Druidism, and other sources of inspiration are the Celtic Myths and Legends that Mr. Squire has gathered together in his book. These tales have come down to us, because they were gathered together by monkish chroniclers, from the twelfth to the fifteenth centuries, but for all the time before that they had been traditional in the Celtic countries, since the days when they were first recited by Druidical bards to the accompaniment of harps.

Cæsar wrote of the Druids : " As one of their leading dogmas, they inculcate this : that souls are not annihilated, but pass after death from one body to another, and they hold that by this teaching men are much encouraged to valour, through disregarding the fear of death. They also discuss and impart to the young many things concerning the heavenly bodies and their movements, the size of the world and our earth, natural science, and of the influence and power of the immortal gods." Again quoting Cæsar: " The whole Gaulish nation is to a great degree devoted to superstitious rites ; and on this account those who are afflicted with severe diseases, or who are engaged in battles and dangers, either sacrifice human beings for victims, or vow that they will immolate themselves, these employ the Druids as ministers for such sacrifices, because they think that, unless the life of man be repaid for the life of man, the will of the immortal gods cannot be appeased. Others make wicker-work images of vast size, the limbs of which they fill with living men and set on fire."

From the little that is known, it can be gathered that the Druids formed a religious aristocracy, to which entrance could only be gained by a long novitiate. There was a Head,

or Pope, elected for life ; they were exempt from war and taxation ; acted as judges, and had a monopoly of learning. Time was reckoned by nights, and the year counted by the revolutions of the moon. Fig. 88 shows a water-clock which is supposed to have been invented by the Druids.

White bulls were sacrificed before the mistletoe was cut from the sacred oak. Captives were killed, and signs read from the flow of their blood, and the palpitation of their entrails.

The Gaulish Druids looked to their British brethren, as possessed of a purer faith, and novices were sent here to learn the mysteries. This came about because the Continent fell under the influence of Rome at an earlier date than we did ; for the same reason, with the advent of the Romans here, Druidism was driven into the West, because its practices shocked even the Romans, until they finally routed it out of its headquarters in Anglesey. It survived in Ireland, which never fell under the Roman influence, until S. Patrick overthrew Cromm Cruaich.

If the Celtic legends are poisoned by hints of awful cruelty, we must yet remember that it was not the cruelty of the Romans, who enjoyed the killing in the Amphitheatre, but the religion of sacrifice carried to its most awful conclusion. The Druids were not cruel for cruelty's sake, but to propitiate the gods.

On the other side of the picture, we have the pleasant fact that the Celtic Myths and Legends, becoming traditional, were handed down, and became in the hands of the monkish chroniclers the foundation on which has been built a Literature which is entirely our own.

We have seen what great artists the Celts were, when they turned to handicraft ; their metal work, and enamels, have been the inspiration of many an artistic revival, hailed as new, and yet in reality just as old as the Druids.

The great Celtic festivals were Beltane at the beginning of May, Midsummer Day, the Feast of Lugh in August, and Samhain. We still have survivals of these in May Day, S. John's Day, Lammas, and Hallow-e'en or All Saints, and the bonfires around which we dance on joyful occasions, started life as the sacrificial pyres on which victims were burned to propitiate the gods, or cattle offered to stay the ravages of a murrain, or plague, at the original Celtic festivals.

There is a poem to Cromm Cruaich in the Books of Leinster which seems to us to explain the spirit of the times:

"Here used to be
A high idol with many fights,
Which was named the Cromm Cruaich;
It made every tribe to be without peace.

'Twas a sad evil!
Brave Gaels used to worship it.
From it they would not without tribute ask
To be satisfied as to their portion of the hard world.
. . . . . .

To him without glory
They would kill their piteous, wretched offspring
With much wailing and peril,
To pour their blood around Cromm Cruaich.

Milk and corn
They would ask from him speedily
In return for one-third of their healthy issue:
Great was the horror and the scare of him."

The books of Leinster were compiled early in the twelfth century by Finn macGorman, Bishop of Kildare, and he as a Christian may perhaps have twisted the tale a little to make Cromm a slightly worse fellow than he was, so as to emphasize the importance of his destruction by the "good Patrick of Macha," yet on the whole there is little doubt that in the days of the Druids, the world was ruled by Horror.

If we understand this, it also explains how it was, that when an obscure Jew was crucified in Palestine, and left behind a handful of disciples, who preached that God was Love, it came as a light to lighten the darkness in a world that was horrible to the poor and oppressed, and held little comfort for them; and here, for a time, our story ends.

INDEX TO TEXT AND ILLUSTRATIONS

NOTE.—The ordinary figures denote references to pages of text, those in black type, the Illustrations.

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