

ANCIENT MAN IN BRITAIN

(A History of the

BY

DONALD A. MACKENZIE

Author of "Egyptian Myth and Legend"

"Myths of Crete and Pre-Hellenic Europe" "Colour Symbolism" &c.

WITH FOREWORD BY

G. ELLIOT SMITH, F.R.S.

BLACKIE AND SON LIMITED

50 OLD BAILEY, LONDON; GLASGOW, BOMBAY

Printed in Great Britain

1922

FOREWORD

In his Presidential Address to the Royal Anthropological Institute this year the late Dr. Rivers put his finger upon the most urgent need for reform in the study of Man, when he appealed for "the Unity of Anthropology". No true conception of the nature and the early history of the human family can be acquired by investigations, however carefully they may be done, of one class of evidence only. The physical characters of a series of skulls can give no reliable information unless their exact provenance and relative age are known. But the interpretation of the meaning of these characters cannot be made unless we know something of the movements of the people and the distinctive peculiarities of the inhabitants of the foreign lands from which they may have come. No less important than the study of their physical structure is the cultural history of peoples. The real spirit of a population is revealed by its social and industrial achievements, and by its

customs and beliefs, rather than by the shape of the heads and members of its units. The revival of the belief in the widespread diffusion of culture in early times has, as one of its many important effects, directed attention to the physical peculiarities of the mixed populations of important foci of civilization throughout the world. Such inquiries have not only enabled the student of human structure to detect racial affinities where he might otherwise have neglected to look for them, but on the other hand they have been able to give the investigator of cultural diffusion evidence of the most definite and irrefutable kind in corroboration of the reality of his inferences.

At the present time students are just awakening to the fact that no adequate idea of the anthropology of any area can be acquired unless every kind of evidence, somatic and cultural, be taken into account, and the problems of the particular locality are integrated with those worldwide movements of men and of civilization of which the people and culture of that locality form a part.

The great merit of Mr. Donald Mackenzie's book is due in the main to the fact that he has taken this wider vision of his subject and interpreted the history of early man in Britain, not simply by describing the varieties of head-form or of implements, customs and beliefs, but rather

by indicating how these different categories of information can be put into their appropriate setting in the history of mankind as a whole. There is nothing of technical pedantry about Mr. Mackenzie's writing. He has made himself thoroughly familiar with the customs and beliefs of the whole world, as his remarkable series of books on mythology has revealed, and in the process of acquiring this mass of information he has not sacrificed his common sense and powers of judgment. He has been able to see clearly through this amazing jumble of confusing statements the way in which every phase of civilization in all parts of the world is closely correlated with the rest; and he has given luminous expression to this clear vision of the history of man and civilization as it affects Britain.

G. ELLIOT SMITH,

The University of London.



PREFACE

This volume deals with the history of man in Britain from the Ice Age till the Roman period. The evidence is gleaned from the various sciences which are usually studied apart, including geology, archæology, philology, ethnology or anthropology, &c., and the writer has set himself to tell the story of Ancient Man in a manner which will interest a wider circle of readers than is usually reached by purely technical books. It has not been assumed that the representatives of Modern Man who first settled in Europe were simple-minded savages. The evidence afforded by the craftsmanship, the burial customs, and the art of the Crô-Magnon races, those contemporaries of the reindeer and the hairy mammoth in South-western France, suggests that they had been influenced by a centre of civilization in which considerable progress had already been achieved. There is absolutely no evidence that the pioneers were lacking in intelligence or foresight. If we are to judge merely by their skeletons and the shapes and sizes of their skulls, it would appear that they were, if anything, both physically and mentally superior to the average present-day inhabitants of Europe. Nor were they entirely isolated from the ancient culture area by which they had been originally influenced. As is shown, the evidence afforded by an Indian Ocean sea-shell, found in a Crô-

Magnon burial cavern near Mentone, indicates that much has yet to be discovered regarding the activities of the early people.

In writing the history of Ancient Man in Britain, it has been found necessary to investigate the Continental evidence. When our early ancestors came from somewhere, they brought something with them, including habits of life and habits of thought. The story unfolded by British finds is but a part of a larger story; and if this larger story is to be reconstructed, our investigations must extend even beyond the continent of Europe. The data afforded by the "Red Man of Paviland", who was buried with Crô-Magnon rites in a Welsh cave, not only emphasize that Continental and North African cultural influences reached Britain when the ice-cap was retreating in Northern Europe, but that from its very beginnings the history of our civilization cannot be considered apart from that of the early civilization of the world as a whole. The writer, however, has not assumed in this connection that in all parts of the world man had of necessity to pass through the same series of evolutionary stages of progress, and that the beliefs, customs, crafts, arts, &c., of like character found in different parts of the world were everywhere of spontaneous generation. There were inventors and discoverers and explorers in ancient times as there are at present, and many new contrivances were passed on from people to people. The man who, for instance, first discovered how to "make fire" by friction of fire-sticks was undoubtedly a great scientist and a benefactor of his kind. It is shown that shipbuilding had a definite area of origin.

The "Red Man of Paviland" also reveals to us minds pre-occupied with the problems of life and death. It is evident that the corpse of the early explorer was smeared with red earth and decorated with charms for very definite reasons. That the people who thus interred

their dead with ceremony were less intelligent than the Ancient Egyptians who adopted the custom of mummification, or the Homeric heroes who practised cremation, we have no justification for assuming.

At the very dawn of British history, which begins when the earliest representatives of Modern Man reached our native land, the influences of cultures which had origin in distant areas of human activity came drifting northward to leave an impress which does not appear to be yet wholly obliterated. We are the heirs of the Ages in a profounder sense than has hitherto been supposed.

Considered from this point of view, the orthodox scheme of Archæological Ages, which is of comparatively recent origin, leaves much to be desired. If anthropological data have insisted upon one thing more than another, it is that modes of thought, which govern action, were less affected by a change of material from which artifacts (articles made by man) were manufactured than they were by religious ideas and by new means for obtaining the necessary food supply. A profounder change was effected in the habits of early man in Britain by the introduction of the agricultural mode of life, and the beliefs, social customs, &c., connected with it, than could possibly have been effected by the introduction of edged implements of stone, bone, or metal.

As a substitute for the Archæological Ages, the writer suggests in this volume a new system, based on habits of life, which may be found useful for historical purposes. In this system the terms "Palæolithic", "Neolithic", &c., are confined to industries. "Neolithic man", "Bronze Age man", "Iron Age man", and other terms of like character may be favoured by some archæologists, but they mean little or nothing to most anatomists, who detect different racial types in a single "Age". A history of ancient man cannot ignore one set of scientists to pleasure another.

Several chapters are devoted to the religious beliefs and customs of our ancestors, and it is shown that there is available for study in this connection a mass of evidence which the archæological agnostics are too prone to ignore. The problem of the megalithic monuments must evidently be reconsidered in the light of the fuller anthropological data now available. Indeed, it would appear that a firmer basis than that afforded by "crude evolutionary ideas" must be found for British archæology as a whole. The evidence of surviving beliefs and customs, of Celtic philology and literature, of early Christian writings, and of recent discoveries in Spain, Mesopotamia, and Egypt, cannot, to say the least of it, be wholly ignored.

In dealing with the race problem, the writer has sifted the available data which throw light on its connection with the history of British culture, and has written as he has written in the hope that the growth of fuller knowledge on the subject will be accompanied by the growth of a deeper sympathy and a deeper sense of kinship than has hitherto prevailed in these islands of ours, which were colonized from time to time by groups of enterprising pioneers, who have left an enduring impress on the national character. The time is past for beginning a history of Britain with the Roman invasion, and for the too-oft-repeated assertion that before the Romans reached Britain our ancestors were isolated and half civilized.

DONALD A. MACKENZIE.

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ANCIENT MAN IN BRITAIN

CHAPTER I

Britons of the Stone Age

Caricatures of Early Britons—Enterprising Pioneers—Diseases and Folk-cures—Ancient Surgical Operations—Expert Artisans—Organized Communities—Introduction of Agriculture—Houses and Cooking Utensils—Spinning and Weaving—Different Habits of Life—The Seafarers.

The Early Britons of the Stone Age have suffered much at the hands of modern artists, and especially the humorous artists. They are invariably depicted as rude and irresponsible savages, with semi-negroid features, who had perforce to endure our rigorous and uncertain climate clad in loosely fitting skin garments, and to go about, even in the depth of winter, barefooted and bare-headed, their long tangled locks floating in the wind.

As a rule, the artists are found to have confused ideas regarding the geological periods. Some place the white savages in the age when the wonderful megalithic monuments were erected and civilization was well advanced, while others consign them to the far-distant Cretaceous Age in association with the monstrous reptiles that browsed on tropical vegetation, being unaware, apparently, that the reptiles in question ceased to exist

before the appearance of the earliest mammals. Not unfrequently the geological ages and the early stages of human culture are hopelessly mixed up, and monsters that had been extinct for several million years are shown crawling across circles that were erected by men possessed of considerable engineering skill.

It is extremely doubtful if our remote ancestors of the Stone Age were as savage or as backward as is generally supposed. They were, to begin with, the colonists who made Britain a land fit for a strenuous people to live in. We cannot deny them either courage or enterprise, nor are we justified in assuming that they were devoid of the knowledge and experience required to enable them to face the problems of existence in their new environment. They came from somewhere, and brought something with them; their modes of life did not have origin in our native land.

Although the early people lived an open-air life, it is doubtful if they were more physically fit than are the Britons of the twentieth century. They were certainly not immune from the ravages of disease. In their graves are found skeletons of babies, youths, and maidens, as well as those of elderly men and women; some spines reveal unmistakable evidence of the effects of rheumatism, and worn-down teeth are not uncommon. It is possible that the diseases associated with marshy localities and damp and cold weather were fairly prevalent, and that there were occasional pestilences with heavy death-rates. Epidemics of influenza and measles may have cleared some areas for periods of their inhabitants, the survivors taking flight, as did many Britons of the fifth century of our own era, when the country was swept by what is referred to in a Welsh book¹ as "the yellow plague", because "it made yellow and bloodless all whom it attacked". At the same time

¹ *Book of Llan Daf.*

recognition must be given to the fact that the early people were not wholly ignorant of medical science. There is evidence that some quite effective "folk cures" are of great antiquity—that the "medicine-men" and sorcerers of Ancient Britain had discovered how to treat certain diseases by prescribing decoctions in which herbs and berries utilized in modern medical science were important ingredients. More direct evidence is available regarding surgical knowledge and skill. On the Continent and in England have been found skulls on which the operation known as trepanning—the removing of a circular piece of skull so as to relieve the brain from pressure or irritation—was successfully performed, as is shown by the fact that severed bones had healed during life. The accomplished primitive surgeons had used flint instruments, which were less liable than those of metal to carry infection into a wound. One cannot help expressing astonishment that such an operation should have been possible—that an ancient man who had sustained a skull injury in a battle, or by accident, should have been again restored to sanity and health. Sprains and ordinary fractures were doubtless treated with like skill and success. In some of the incantations and charms collected by folk-lorists are lines which suggest that the early medicine-men were more than mere magicians. One, for instance, dealing with the treatment of a fracture, states:

"He put marrow to marrow; he put pith to pith; he put bone to bone; he put membrane to membrane; he put tendon to tendon; he put blood to blood; he put tallow to tallow; he put flesh to flesh; he put fat to fat; he put skin to skin; he put hair to hair; he put warm to warm; he put cool to cool."

"This," comments a medical man, "is quite a wonderful statement of the aim of modern surgical 'co-aptation',

and we can hardly believe such an exact form of words imaginable without a very clear comprehension of the natural necessity of correct and precise setting."¹

The discovery that Stone Age man was capable of becoming a skilled surgeon is sufficient in itself to make us revise our superficial notions regarding him. A new interest is certainly imparted to our examination of his flint instruments. Apparently these served him in good stead, and it must be acknowledged that, after all, a stone tool may, for some purposes, be quite as adequate as one of metal. It certainly does not follow that the man who uses a sharper instrument than did the early Briton is necessarily endowed with a sharper intellect, or that his ability as an individual artisan is greater. The Stone Age man displayed wonderful skill in chipping flint—a most difficult operation—and he shaped and polished stone axes with so marked a degree of mathematical precision that, when laid on one side, they can be spun round on a centre of gravity. His saws were small, but are still found to be quite serviceable for the purposes they were constructed for, such as the cutting of arrow shafts and bows, and the teeth are so minute and regular that it is necessary for us to use a magnifying glass in order to appreciate the workmanship. Some flint artifacts are comparable with the products of modern opticians. The flint workers must have had wonderfully keen and accurate eyesight to have produced, for instance, little "saws" with twenty-seven teeth to the inch, found even in the north of Scotland. In Ancient Egypt these "saws" were used as sickles.

Considerable groups of the Stone Age men of Britain had achieved a remarkable degree of progress. They lived in organized communities, and had evidently codes of laws and regularized habits of life. They were not

¹ Dr. Hugh Cameron Gillies in *Home Life of the Highlanders*, Glasgow, 1911, pp. 85 et seq.

entirely dependent for their food supply on the fish they caught and the animals they slew and snared. Patches of ground were tilled, and root and cereal crops cultivated with success. Corn was ground in handmills;¹ the women baked cakes of barley and wheat and rye. A rough but serviceable pottery was manufactured and used for cooking food, for storing grain, nuts, and berries, and for carrying water. Houses were constructed of wattles interwoven between wooden beams and plastered over with clay, and of turf and stones; these were no doubt thatched with heather, straw, or reeds. Only a small proportion of the inhabitants of Ancient Britain could have dwelt in caves, for the simple reason that caves were not numerous. Underground dwellings, not unlike the "dug-outs" made during the recent war, were constructed as stores for food and as winter retreats.

As flax was cultivated, there can be little doubt that comfortable under-garments were worn, if not by all, at any rate by some of the Stone Age people. Wool was also utilized, and fragments of cloth have been found on certain prehistoric sites, as well as spindle-whorls of stone, bone, and clay, wooden spindles shaped so as to serve their purpose without the aid of whorls, bone needles, and crochet or knitting-pins. Those who have assumed that the Early Britons were attired in skin garments alone, overlook the possibility that a people who could sew, spin, and weave, might also have been skilled in knitting, and that the jersey and jumper may have a respectable antiquity. The art of knitting is closely related to that of basket-making, and some would have it that many of the earliest potters plastered their clay inside baskets of reeds, and that the decorations of the early pots were suggested by the markings impressed

¹ A pestle or stone was used to pound grain in hollowed slabs or rocks before the mechanical mill was invented.

by these. It is of interest to note in this connection that some Roman wares were called *bascaudæ*, or "baskets", and that the Welsh *basged*—*basg*, from which our word "basket" is derived, signify "network" and "plaiting". The decoration of some pots certainly suggests the imitation of wickerwork and knitting, but there are symbols also, and these had, no doubt, a religious significance.

It does not follow, of course, that all the Early Britons of the so-called Stone Age were in the same stage of civilization, or that they all pursued the same modes of life. There were then, as there are now, backward as well as progressive communities and individuals, and there were likewise representatives of different races—tall and short, spare and stout, dark and fair men and women, who had migrated at different periods from different areas of origin and characterization. Some peoples clung to the sea-shore, and lived mainly on deep-sea fish and shell-fish; others were forest and moorland hunters, who never ventured to sea or cultivated the soil. There is no evidence to indicate that conflicts took place between different communities. It may be that in the winter season the hunters occasionally raided the houses and barns of the agriculturists. The fact, however, that weapons were not common during the Stone Age cannot be overlooked in this connection. The military profession had not come into existence.

Certain questions, however, arise in connection with even the most backward of the Stone Age peoples. How did they reach Britain, and what attracted them from the Continent? Man did not take to the sea except under dire necessity, and it is certain that large numbers could not possibly have crossed the English Channel on logs of wood. The boatbuilder's craft and the science of navigation must have advanced considerably before large migrations across the sea could have taken place.

When the agricultural mode of life was introduced, the early people obtained the seeds of wheat and barley, and, as these cultivated grasses do not grow wild in Britain, they must have been introduced either by traders or settlers.

It is quite evident that the term "Stone Age" is inadequate in so far as it applies to the habits of life pursued by the early inhabitants of our native land. Nor is it even sufficient in dealing with artifacts, for some people made more use of horn and bone than of stone, and these were represented among the early settlers in Britain.

CHAPTER II

Earliest Traces of Modern Man

The Culture Ages—Ancient Races—The Neanderthals—Crô-Magnon Man—The Evolution Theory—Palæolithic Ages—The Transition Period—Neanderthal Artifacts—Birth of Crô-Magnon Art—Occupations of Flint-yielding Stations—Ravages of Disease—Duration of Glacial and Inter-glacial Periods.

In 1865, Sir John Lubbock (afterwards Lord Avebury), writing in the *Prehistoric Times*, suggested that the Stone Age artifacts found in Western Europe should be classified into two main periods, to which he applied the terms Palæolithic (Old Stone) and Neolithic (New Stone). The foundations of the classification had previously been laid by the French antiquaries M. Boucher de Perthes and Edouard Lartet. It was intended that Palæolithic should refer to rough stone implements, and Neolithic to those of the period when certain artifacts were polished.

At the time very little was known regarding the early peoples who had pursued the flint-chipping and polishing industries, and the science of geology was in its infancy. A great controversy, which continued for many years, was being waged in scientific circles regarding the remains of a savage primitive people that had been brought to light. Of these the most notable were a woman's skull found in 1848 in a quarry at Gibraltar, the Cannstadt skull, found in 1700, which had long been lying in Stuttgart Museum undescribed and unstudied, and portions of a male skeleton taken from a

limestone cave in Neanderthal, near Dusseldorf, in 1857. Some refused to believe that these, and other similar remains subsequently discovered, were human at all; others declared that the skulls were those of idiots or that they had been distorted by disease. Professor Huxley contended that evidence had been forthcoming to prove the existence in remote times of a primitive race from which modern man had evolved.

It is unnecessary here to review the prolonged controversy. One of its excellent results was the stimulation of research work. A number of important finds have been made during the present century, which have thrown a flood of light on the problem. In 1908 a skeleton was discovered in a grotto near La Chapelle-aux-Saints in France, which definitely established the fact that during the earlier or lower period of the Palæolithic Age a Neanderthal race existed on the Continent, and, as other remains testify, in England as well. This race became extinct. Some hold that there are no living descendants of Neanderthal man on our globe; others contend that some peoples, or individuals, reveal Neanderthaloid traits. The natives of Australia display certain characteristics of the extinct species, but they are more closely related to Modern Man (*Homo sapiens*). There were pre-Neanderthal peoples, including Piltdown man and Heidelberg man.

During the Palæolithic Age the ancestors of modern man appeared in Western Europe. These are now known as the Crô-Magnon races.

In dealing with the Palæolithic Age, therefore, it has to be borne in mind that the artifacts classified by the archaeologists represent the activities, not only of different races, but of representatives of different species of humanity. Neanderthal man, who differed greatly from Modern man, is described as follows by Professor Elliot Smith:

"His short, thick-set, and coarsely built body was carried in a half-stooping slouch upon short, powerful, and half-flexed legs of peculiarly ungraceful form. His thick neck sloped forward from the broad shoulders to support the massive flattened head, which protruded forward, so as to form an unbroken curve of neck and back, in place of the alteration of curves, which is one of the graces of the truly erect *Homo sapiens*. The heavy overhanging eyebrow ridges, and retreating forehead, the great coarse face, with its large eye-sockets, broad nose, and receding chin, combined to complete the picture of unattractiveness, which it is more probable than not was still further emphasized by a shaggy covering of hair over most of the body. The arms were relatively short, and the exceptionally large hands lacked the delicacy and the nicely balanced co-operation of thumb and fingers, which is regarded as one of the most distinctive of human characteristics."¹

As Professor Osborn says: "the structure of the hand is a matter of the highest interest in connection with the implement-making powers of the Neanderthals". He notes that in the large and robust Neanderthal hand, "the joint of the metacarpal bone which supports the thumb is of peculiar form, convex, and presenting a veritable convex condyle, whereas in the existing human races the articular surface of the upper part of the thumb joint is saddle-shaped, that is concave from within backward, and convex from without inward". The Neanderthal fingers were "relatively short and robust".²

The Crô-Magnons present a sharp contrast to the Neanderthals. In all essential features they were of modern type. They would, dressed in modern attire, pass through the streets of a modern city without particular notice being taken of them. One branch of the Crô-Magnons was particularly tall and handsome, with an average height for the males of 6 feet 1½ inches, with

¹ *Primitive Man*.

² *Men of the Old Stone Age* (1916), pp. 240-1.

chest very broad in the upper part, and remarkably long shin-bones that indicate swiftness of foot. The Neanderthals had short shins and bent knees, and their gait must have been slow and awkward. The Crô-Magnon hand was quite like that of the most civilized men of to-day.

It is of importance to bring out these facts in connection with the study of the development of early civilization in our native land, because of the prevalence of the theory that in collections of stone implements, dating from remote Palæolithic times till the Neolithic Age, a complete and orderly series of evolutionary stages can be traced. "As like needs", says one writer in this connection, "produce like means of satisfaction, the contrivances with which men in similar stages of progress overcome natural obstacles are in all times very much the same."¹ Hugh Miller, the Cromarty stonemason and geologist, was one of the first to urge this view. In 1835, he wrote in his *Scenes and Legends*, (1st edition, pp. 31, 32):

"Man in a savage stage is the same animal everywhere, and his constructive powers, whether employed in the formation of a legendary story or of a battleaxe, seem to expatiate almost everywhere in the same rugged track of invention. For even the traditions of this first stage may be identified, like its weapons of war, all the world over."²

He had written in this vein after seeing the collection of stone weapons and implements in the Northern Institution at Inverness. "The most practised eye", he commented, "can hardly distinguish between the weapons of the Old Scot and the New Zealander."

¹ *British Museum—A Guide to the Antiquities of the Stone Age*, p. 76 (1902).

² Miller had adopted the "stratification theory" of Professor William Robertson of Edinburgh University, who, in his *The History of America* (1777), wrote: "Men in their savage state pass their days like the animals round them, without knowledge or veneration of any superior power".

Eyes have become more practised in dealing with flints since Miller's time. Andrew Lang remembered his Miller when he wrote:

"Now just as the flint arrowheads are scattered everywhere, in all the continents and isles—and everywhere are much alike, and bear no very definite marks of the special influence of race—so it is with the habits and legends investigated by the student of folk-lore".¹

The recent discovery that the early flints found in Western Europe and in England were shaped by the Neanderthals and the pre-Neanderthals compels a revision of this complacent view of an extraordinarily difficult and complex problem. It is obvious that the needs and constructive powers of the Neanderthals, whose big clumsy hands lacked "the delicate play between the thumb and fingers characteristic of modern races", could not have been the same as those of the Crô-Magnons, and that the finely shaped implements of the Crô-Magnons could not have been evolved from the rough implements of the Neanderthals. The craftsmen of one race may, however, have imitated, or attempted to imitate, the technique of those of another.

There was a distinct break in the continuity of culture during the Palæolithic Age, caused by the arrival in Western Europe of the ancestors of Modern Man. The advent of the Crô-Magnons in Europe "represents on the cultural side", as Professor Elliot Smith says in *Primitive Man*, "the most momentous event in its history".

Some urge that the term "Palæolithic" should now be discarded altogether, but its use has become so firmly established that archæologists are loth to dispense with it. The first period of human culture has, however, had to be divided into "Lower" and "Upper Palæo-

¹ *Custom and Myth* (1910 edition), p. 13. Lang's views regarding flints are worthless.



Mousterian type
(from Suffolk)



Acheulian type
(from Suffolk)



Photos. Oxford University Press
Chellean type
(from the Thames gravel)



Photo. Mansell

EXAMPLES OF LOWER PALEOLITHIC INDUSTRIES
FOUND IN ENGLAND
(British Museum)

lithic"—Lower closing with the disappearance of the Neanderthals, and Upper beginning with the arrival of the Crô-Magnons. These periods embrace the subdivisions detected during the latter half of last century by the French archæologists, and are now classified as follows:

Lower Palæolithic—

1. Pre-Chellean.
2. Chellean (named after the town of Chelles, east of Paris).
3. Acheulian (named after St. Acheul in Somme valley).
4. Mousterian (named after the caves of Le Moustier in the valley of the River Vézère).

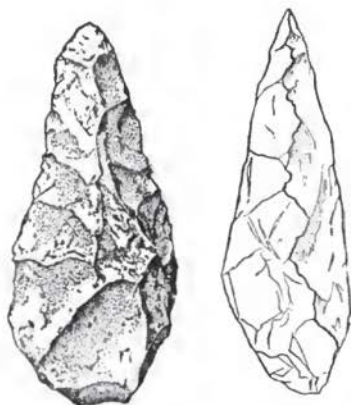
Upper Palæolithic—

1. Aurignacian (named after Aurignac, Haute Garonne).
2. Solutrean (named after Solutré, Saône-et-Loire).
3. Magdalenian (named after La Madeleine in the valley of the River Vézère).

Then follows, in France, the Azilian stage (named after Mas d'Azil, a town at the foot of the Pyrenees) which is regarded as the link between Upper Palæolithic and Neolithic. But in Western Europe, including Britain, there were really three distinct cultures during the so-called "Transition Period". These are the Azilian, the Tardenoisian, and the Maglemosian. These cultures were associated with the movements of new peoples in Europe.

The pre-Chellean flints (also called Eoliths) were wrought by the pre-Neanderthals. Chellean probably represents the earliest work in Europe of a pre-Neanderthal type like Piltdown man. The most characteristic

implement of this phase is the *coup de poing*, or pear-shaped "hand axe", which was at first roughly shaped and unsymmetrical. It was greatly improved during the Acheulian stage, and after being finely wrought in Mousterian times, when it was not much used, was supplanted by smaller and better chipped implements. The Neanderthals practised the Mousterian industry.



Chellean *Coup de Poing* or "Hand Axe"

Right-hand view shows sinuous cutting edge.

A profound change occurred when the Aurignacian stage of culture was inaugurated by the intruding Crô-Magnons. Skilled workers chipped flint in a new way, and, like the contemporary inhabitants of North Africa, shaped artifacts from bone; they also used reindeer horn, and the ivory tusks of mammoths. The birth of pictorial art took place in Europe after the Crô-Magnons arrived.

It would appear that the remnants of the Neanderthals in the late Mousterian stage of culture were stimulated by the arrival of the Crô-Magnons to imitate new flint forms and adopt the new methods of workmanship. There is no other evidence to indicate that the Crô-Magnons came into contact with communities of the Neanderthals. In these far-off days Europe was thinly peopled by hunters who dwelt in caves. The climate was cold, and the hairy mammoth and the reindeer browsed in the lowlands of France and Germany. Italy was linked with Africa; the grass-lands of North Africa stretched southward across the area now known as the Sahara desert, and

dense forests fringed the banks of the River Nile and extended eastward to the Red Sea.

Neanderthal man had originally entered Europe when the climate was much milder than it is in our own time. He crossed over from Africa by the Italian land-bridge, and he found African fauna, including species of the elephant, rhinoceros, hippopotamus, lion, and the hyæna, jackal, and sabre-tooth tiger in Spain, France, Germany. Thousands of years elapsed and the summers became shorter, and the winters longer and more severe, until the northern fauna began to migrate southward, and the African fauna deserted the plains and decaying forests of Europe. Then followed the Fourth Glacial phase, and when it was passing away the Neanderthals, who had long been in the Mousterian phase of culture, saw bands of Crô-Magnons prospecting and hunting in southern Europe. The new-comers had migrated from some centre of culture in North Africa, and appear to have crossed over the Italian land-bridge. It is unlikely that many, if any, entered Europe from the east. At the time the Black Sea was more than twice its present size, and glaciers still blocked the passes of Asia Minor.

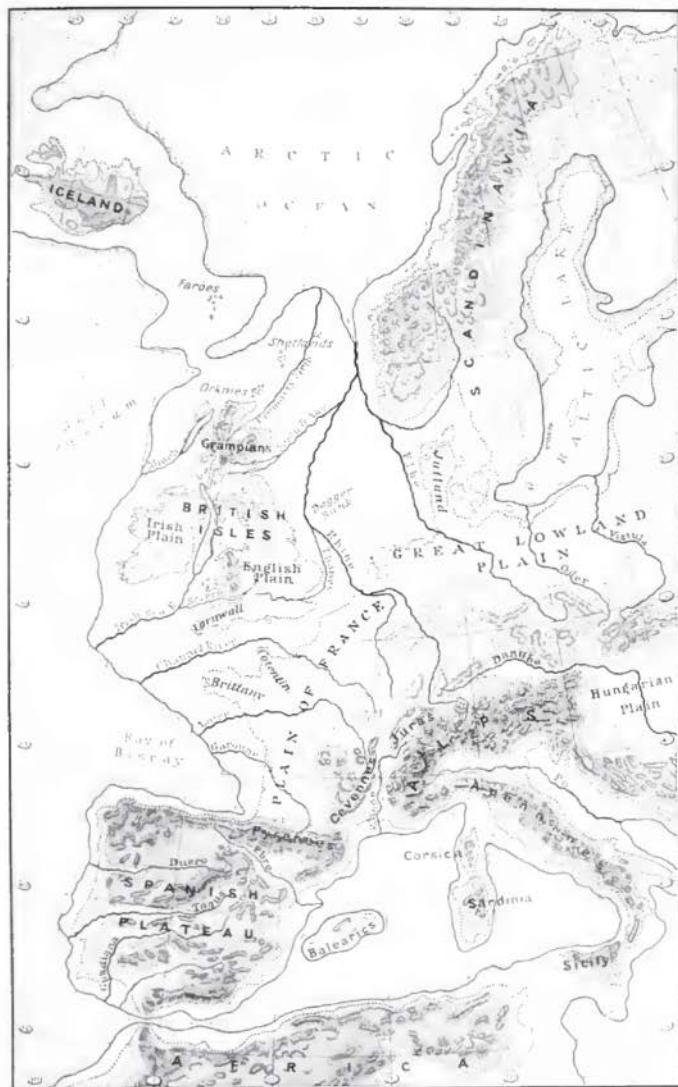
A great contrast was presented by the two types of mankind. The short, powerfully built, but slouching and slow-footed Neanderthals were, in a conflict, no match for the tall, active, and swift-footed Crô-Magnons, before whom they retreated, yielding up their flint-working stations, and their caves and grottoes. It may be, as some suggest, that fierce battles were fought, but there is no evidence of warfare; it may be that the Neanderthals succumbed to imported diseases, as did so many thousands of the inhabitants of the Amazon Valley, when measles and other diseases were introduced by the Spaniards. The fact remains that the Neanderthals died out as completely as did the Tasmanians

before the advance of British settlers. We do not know whether or not they resisted, for a time, the intrusion of strangers on their hunting-grounds. It may be that the ravages of disease completed the tragic history of such relations as they may have had with the ancestors of Modern Man.

At this point, before we deal with the arrival in Britain of the representatives of the early races, it should be noted that differences of opinion exist among scientists regarding the geological horizons of the Palæolithic culture stages. In the Pleistocene Age there appear to have been four great glacial epochs and two minor ones. Geological opinion is, however, divided in this connection.

During the First Glacial epoch the musk-ox, now found in the Arctic regions, migrated as far south as Sussex. The Pliocene¹ mammals were not, however, completely exterminated; many of them survived until the First Interglacial epoch, which lasted for about 75,000 years—that is three times longer than the First Glacial epoch. The Second Glacial epoch is believed to have extended over 25,000 years. It brought to the southern shores of the Baltic Sea the reindeer and the hairy mammoth. Then came the prolonged Second Interglacial stage which prevailed for about 200,000 years. The climate of Europe underwent a change until it grew warmer than it is at the present day, and trees, not now found farther north than the Canary Islands, flourished in the forests of southern France. The Third Glacial stage gradually came on, grew in intensity, and then declined during a period estimated at about 25,000 years. It was followed by the Third Interglacial epoch which may have extended over at least 100,000 years. African animals returned to Europe and mingled with those that wandered from Asia and

¹ The last division of the Tertiary period.



WESTERN EUROPE DURING THE THIRD INTER-GLACIAL EPOCH

(According to the Abbé Breuil the Strait of Gibraltar was open and the Balearics, a great island.)



the survivors in Europe of the Second Interglacial fauna. The Fourth Glacial epoch, which is believed to have lasted for about 25,000 years, was very severe. All the African or Asiatic mammals either migrated or became extinct with the exception of lions and hyænas, and the reindeer found the western plains of Europe as congenial as it does the northern plains at the present time.

During the Fourth Post-glacial epoch there were for a period of about 25,000 years¹ partial glaciations and milder intervals, until during the Neolithic Age of the archæologists the climate of Europe reached the phase that at present prevails.

When, then, did man first appear in Europe? According to some geologists, and especially Penck and James Geikie, the Chellean phase of culture originated in the Second Interglacial epoch and the Mousterian endured until the Third Interglacial stage, when the Neanderthals witnessed the arrival of the Crô-Magnon peoples. Boule, Breuil, and others, however, place the pre-Chellean, Chellean, Acheulian, and early Mousterian stages of Lower (or Early) Palæolithic culture in the Third Interglacial epoch, and fix the extermination of Neanderthal man, in his late Mousterian culture stage, at the close of the Fourth Glacial epoch. This view is now being generally accepted. It finds favour with the archæologists, and seems to accord with the evidence they have accumulated. The Upper Palæolithic culture of Crô-Magnon man, according to some, began in its Aurignacian phase about 25,000 years ago; others consider, however, that it began about five or six thousand years ago, and was contemporaneous with the long pre-Dynastic civilization of Egypt. At the time England was connected with the Continent by a land-bridge,

¹ It must be borne in mind that the lengths of these periods are subject to revision. Opinion is growing that they were not nearly so long as here stated.

and as the climate grew milder the ancestors of modern man could walk across from France to the white cliffs of Dover which were then part of a low range of mountains. As will be shown, there is evidence that the last land movement in Britain did not begin until about 3000 B.C.

CHAPTER III

The Age of the "Red Man" of Wales

An Ancient Welshman—Aurignacian Culture in Britain—Coloured Bones and Luck Charms—The Cave of Aurignac—Discovery at Crô-Magnon Village—An Ancient Tragedy—Significant Burial Customs—Crô-Magnon Characters—New Race Types in Central Europe—Galley Hill Man—The Piltdown Skull—Ancient Religious Beliefs—Life Principle in Blood—Why Body-painting was practised—"Sleepers" in Caves—Red Symbolism in different Countries—The Heart as the Seat of Life—The Green Stone Talisman—"Soul Substance".

The earliest discovery of a representative of the Crô-Magnons was made in 1823, when Dr. Buckland explored the ancient cave-dwelling of Paviland in the vicinity of Rhossilly, Gower Peninsula, South Wales. This cave, known as "Goat's Hole", is situated between 30 and 40 feet above the present sea-level, on the face of a steep sandstone cliff about 100 feet in height; it is 60 feet in length and 200 feet broad, while the roof attains an altitude of over 25 feet. When this commodious natural shelter was occupied by our remote ancestors the land was on a much lower level than it is now, and it could be easily reached from the seashore. Professor Sollas has shown that the Paviland cave-dwellers were in the Aurignacian stage of culture, and that they had affinities with the tall Crô-Magnon peoples on the Continent.¹

¹ *Journal of the Royal Anthropological Institute*, Vol. XLIII, 1913.

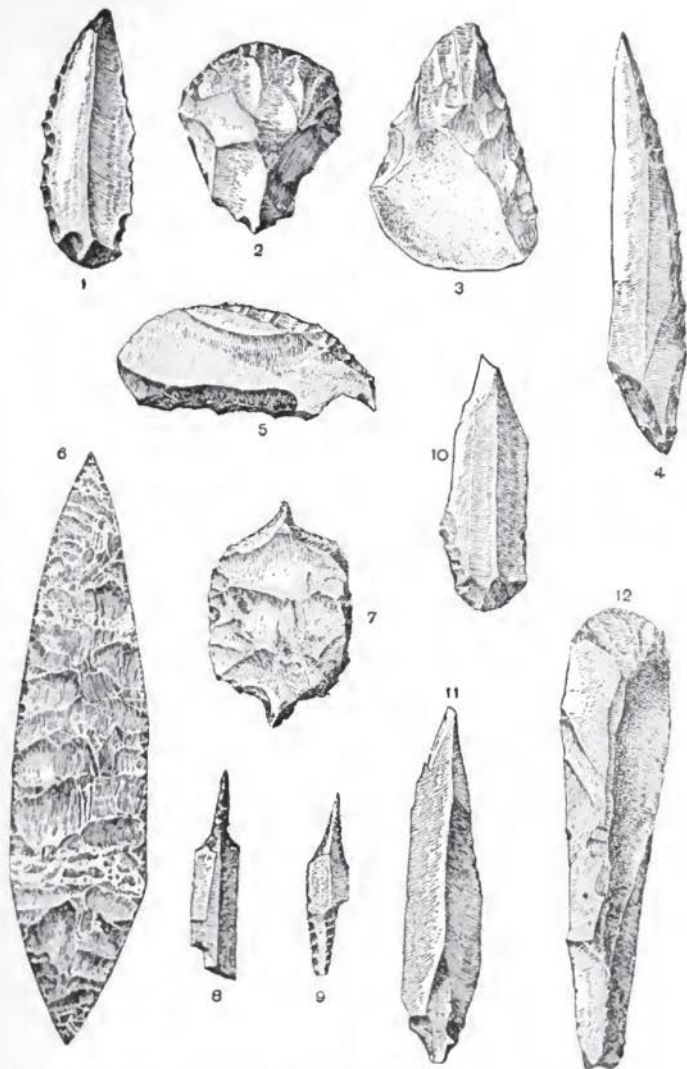
A human skeleton of a tall man was found in the cave deposit in association with the skull and tusks of a hairy mammoth, and with implements of Aurignacian type. Apparently the Aurignacian colonists had walked over the land-bridge connecting England with France many centuries before the land sank and the Channel tides began to carve out the white cliffs of Dover.

In his description of the bones of the ancient cave-man, who has been wrongly referred to as the "Red Lady of Paviland", Dr. Buckland wrote:

"They were all of them stained superficially with a dark brick-red colour, and enveloped by a coating of a kind of ruddle, composed of red micaceous oxide of iron, which stained the earth, and in some parts extended itself to the distance of about half an inch around the surface of the bones. The body must have been entirely surrounded or covered over at the time of its interment with this red substance."

Near the thighs were about two handfuls of small shells (*Nerita litoralis*) which had evidently formed a waist girdle. Over forty little rods of ivory, which may have once formed a long necklace, lay near the ribs. A few ivory rings and a tongue-shaped implement or ornament lay beside the body, as well as an instrument or charm made of the metacarpal bone of a wolf.

The next great discovery of this kind was made twenty-nine years later. In 1852 a French workman was trying to catch a wild rabbit on a lower slope of the Pyrenees, near the town of Aurignac in Haute Garonne, when he made a surprising find. From the rabbit's burrow he drew out a large human bone. A slab of stone was subsequently removed, and a grotto or cave shelter revealed. In the debris were found portions of seventeen skeletons of human beings of different ages and both sexes. Only two skulls were intact.



Upper Palaeolithic Implements

1, Aurignacian (Chatelperron point). 2, 3, Aurignacian (keeled scrapers). 4, Aurignacian point. 5, Magdalenian ("parrot-beak" graving tool). 6, Solutrean (laurel-leaf point). 7, 8, 9, Solutrean (drill, awl, and "shouldered" point). 10, 11, 12, Magdalenian.

This discovery created a stir in the town of Aurignac, and there was much speculation regarding the tragedy that was supposed to have taken place at some distant date. A few folks were prepared to supply circumstantial details by connecting the discovery with vague local traditions. No one dreamt that the burial-place dated back a few thousand years, or, indeed, that the grotto had really been a burial-place, and the mayor of the town gave instructions that the bones should be interred in the parish cemetery.

Eight years elapsed before the grotto was visited by M. Louis Lartet, the great French archæologist. Outside the stone slab he found the remains of an ancient hearth, and a stone implement which had been used for chipping flints. In the outer debris were discovered, too, the bones of animals of the chase, and about a hundred flint artifacts, including knives, projectiles, and sling-stones, besides bone arrows, tools shaped from reindeer horns, and an implement like a bodkin of roe-deer horn. It transpired that the broken bones of animals included those of the cave-lion, the cave-bear, the hyæna, the elk, the mammoth, and the woolly-haired rhinoceros—all of which had been extinct in that part of the world for thousands of years.

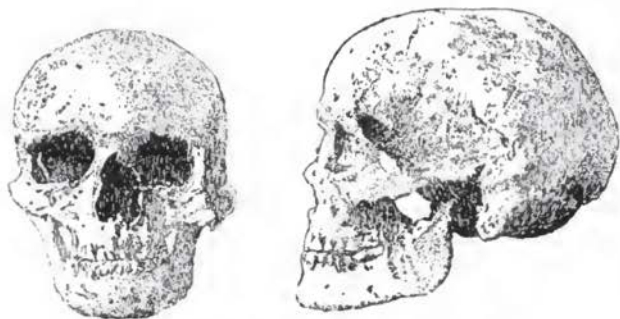
As in the Paviland cave, there were indications that the dead had been interred with ornaments or charms on their bodies. Inside the grotto were found "eighteen small round and flat plates of a white shelly substance, made of some species of cockle (*Cardium*) pierced through the middle, as if for being strung into a bracelet". Perforated teeth of wild animals had evidently been used for a like purpose.

The distinct industry revealed by the grotto finds has been named Aurignacian, after Aurignac. Had the human bones not been removed, the scientists would

have definitely ascertained what particular race of ancient men they represented.

It was not until the spring of 1868 that a flood of light was thrown on the Aurignacian racial problem. A gang of workmen were engaged in the construction of a railway embankment in the vicinity of the village of Crô-Magnon, near Les Eyzies, in the valley of the River Vézère, when they laid bare another grotto. Intimation was at once made to the authorities, and the Minister of Public Instruction caused an investigation to be made under the direction of M. Louis Lartet. The remains of five human skeletons were found. At the back of the grotto was the skull of an old man—now known as "the old man of Crô-Magnon"—and its antiquity was at once emphasized by the fact that some parts of it were coated by stalagmite caused by a calcareous drip from the roof of rock. Near "the old man" was found the skeleton of a woman. Her forehead bore signs of a deep wound that had been made by a cutting instrument. As the inner edge of the bone had partly healed, it was apparent she had survived her injury for a few weeks. Beside her lay the skeleton of a baby which had been prematurely born. The skeletons of two young men were found not far from those of the others. Apparently a tragic happening had occurred in ancient days in the vicinity of the Crô-Magnon grotto. The victims had been interred with ceremony, and in accordance with the religious rites prevailing at the time. Above three hundred pierced marine shells, chiefly of the periwinkle species (*Littorina littorea*), which are common on the Atlantic coasts, and a few shells of *Purpura lapillus* (a purple-yielding shell), *Turitella communis*, &c., were discovered besides the skeletons. These, it would appear, had been strung to form necklaces and other ornamental charms. M. Lartet found, too, a flat ivory pendant pierced with two holes, and was given two

other pendants picked up by young people. Near the skeletons were several perforated teeth, a split block of gneiss with a smooth surface, the worked antlers of a reindeer that may have been used as a pick for excavating flint, and a few chipped flints. Other artifacts of Aurignacian type were unearthed in the debris associated with the grotto, which appears to have been used as a dwelling-place before the interments had taken place.



Skull of a Crô-Magnon Man: front and side views
From the Grotte des Enfants, Mentone. (After Verneau.)

The human remains of the Crô-Magnon grotto were those of a tall and handsome race of which the "Red Man" of Paviland was a representative. Other finds have shown that this race was widely distributed in Europe. The stature of the men varied from 5 feet 10½ inches to 6 feet 4½ inches on the Riviera, that of the women being slightly less. That the Crô-Magnons were people of high intelligence is suggested by the fact that the skulls of the men and women were large, and remarkably well developed in the frontal region. According to a prominent anatomist the Crô-Magnon women had bigger brains than has the average male European of to-day. All these ancient skulls are of the dolichocephalic (long-headed) type. The faces, however, were comparatively

broad, and shorter than those of the modern fair North-Europeans, while the cheek bones were high—a characteristic, by the way, of so many modern Scottish faces.

This type of head—known as the "disharmonic", because a broad face is usually a characteristic of a broad skull, and a long face of a long skull—has been found to be fairly common among the modern inhabitants of the Dordogne valley. These French descendants of the Crô-Magnons are, however, short and "stocky", and most of them have dark hair and eyes. Crô-Magnon types have likewise been identified among the Berbers of North Africa, and the extinct fair-haired Guanches of the Canary Islands, in Brittany, on the islands of northern Holland, and in the British Isles.¹

A comparatively short race, sometimes referred to as the "Combe-Capelle", after the rock-shelter at Combe-Capelle, near Montferrand, Perigord, was also active during the stage of Aurignacian culture. An adult skeleton found in this shelter was that of a man only 5 feet 3 inches in height. The skull is long and narrow, with a lofty forehead, and the chin small and well developed. It has some similarity to modern European skulls. The skeleton had been subjected for thousands of years to the dripping of water saturated with lime, and had consequently been well preserved. Near the head and neck lay a large number of perforated marine shells (*Littorina* and *Nassa*). A collection of finely-worked flints of early Aurignacian type also lay beside the body.

Reference may also be made here to the finds in Moravia. Fragmentary skull caps from Brüx and Brünn are regarded as evidence of a race which differed from the tall Crô-Magnons, and had closer affinities with

¹ For principal references see *The Races of Europe*, W. Z. Ripley, pp. 172 *et seq.*, and *The Anthropological History of Europe*, John Beddoe (Rhind lectures for 1891; revised edition, 1912), p. 47.

Combe-Capelle man. Some incline to connect the Brunn type with England, the link being provided by a skeleton called the "Galley Hill" after the place of its discovery below Gravesend and near Northfleet in Kent. Scientists regard him as a contemporary of the Aurignacian flint-workers of Combe-Capelle and Brunn. "Both the Brûx and Brunn skulls", writes Professor Osborn, "are harmonic; they do not present the very broad, high cheek-bones characteristic of the Crô-Magnon race,¹ the face being of a narrow modern type, but not very long. There is a possibility that the Brunn race was ancestral to several later dolichocephalic groups which are found in the region of the Danube and of middle and southern Germany."²

The Galley Hill man had been buried in the gravels of the "high terrace", 90 feet above the Thames. His bones when found were much decayed and denuded, and the skull contorted. The somewhat worn "wisdom tooth" indicates that he was a "fully-grown adult, though probably not an aged individual". Those who think he was not as old as the flints and the bones of extinct animals found in the gravels, regard him as a pioneer of the Brunn branch of the Aurignacians.

The Piltdown skull appears to date back to a period vastly more ancient than Neanderthal times.

Our special interest in the story of early man in Britain is with the "Red Man" of Paviland and Galley Hill man, because these were representatives of the species to which we ourselves belong. The Neanderthals and pre-Neanderthals, who have left their Eoliths and Palæoliths in our gravels, vanished like the glaciers and the icebergs, and have left, as has been indicated, no descendants in our midst. Our history begins with the arrival of the Crô-Magnon races, who

¹ That is, the tall representatives of the Crô-Magnon races

² *Men of the Old Stone Age*, pp. 335-6.

were followed in time by other peoples to whom Europe offered attractions during the period of the great thaw, when the ice-cap was shrinking towards the north, and the flooded rivers were forming the beds on which they now flow.

We have little to learn from Galley Hill man. His geological horizon is uncertain, but the balance of the available evidence tends to show he was a pioneer of the medium-sized hunters who entered Europe from the east, during the Aurignacian stage of culture. It is otherwise with the "Red Man" of Wales. We know definitely what particular family he belonged to; he was a representative of the tall variety of Crô-Magnons. We know too that those who loved him, and laid his lifeless body in the Paviland Cave, had introduced into Europe the germs of a culture that had been radiated from some centre, probably in the ancient forest land to the east of the Nile, along the North African coast at a time when it jutted far out into the Mediterranean and the Sahara was a grassy plain.

The Crô-Magnons were no mere savages who lived the life of animals and concerned themselves merely with their material needs. They appear to have been a people of active, inventive, and inquiring minds, with a social organization and a body of definite beliefs, which found expression in their art and in their burial customs. The "Red Man" was so called by the archæologists because his bones and the earth beside them were stained, as has been noted, by "red micaceous oxide of iron". Here we meet with an ancient custom of high significance. It was not the case, as some have suggested, that the skeleton was coloured after the flesh had decayed. There was no indication when the human remains were discovered that the grave had been disturbed after the corpse was laid in it. The fact that the earth as well as the bones retained the

coloration affords clear proof that the corpse had been smeared over with red earth which, after the flesh had decayed, fell on the skeleton and the earth and gravel beside it. But why, it will be asked, was the corpse so treated? Did the Crô-Magnons paint their bodies during life, as do the Australians, the Red Indians, and others, to provide "a substitute for clothing"? That cannot be the reason. They could not have concerned themselves about a "substitute" for something they did not possess. In France, the Crô-Magnons have left pictorial records of their activities and interests in their caves and other shelters. Bas reliefs on boulders within a shelter at Laussel show that they did not wear clothing during the Aurignacian epoch which continued for many long centuries. We know too that the Australians and Indians painted their bodies for religious and magical purposes—to protect themselves in battle or enable them to perform their mysteries—rain-getting, food-getting, and other ceremonies. The ancient Egyptians painted their gods to "make them healthy". Prolonged good health was immortality.

The evidence afforded by the Paviland and other Crô-Magnon burials indicates that the red colour was freshly applied before the dead was laid in the sepulchre. No doubt it was intended to serve a definite purpose, that it was an expression of a system of beliefs regarding life and the hereafter.

Apparently among the Crô-Magnons the belief was already prevalent that the "blood is the life". The loss of life appeared to them to be due to the loss of the red vitalizing fluid which flowed in the veins. Strong men who received wounds in conflict with their fellows, or with wild animals, were seen to faint and die in consequence of profuse bleeding; and those who were stricken with sickness grew ashen pale because, as it seemed, the supply of blood was insufficient, a condition

they may have accounted for, as did the Babylonians of a later period, by conceiving that demons entered the body and devoured the flesh and blood. It is not too much to suppose that they feared death, and that like other Pagan religions of antiquity theirs was deeply concerned with the problem of how to restore and prolong life. Their medicine-men appear to have arrived at the conclusion that the active principle in blood was the substance that coloured it, and they identified this substance with red earth. If cheeks grew pale in sickness, the flush of health seemed to be restored by the application of a red face paint. The patient did not invariably regain strength, but when he did, the recovery was in all likelihood attributed to the influence of the blood substitute. Rest and slumber were required, as experience showed, to work the cure. When death took place, it seemed to be a deeper and more prolonged slumber, and the whole body was smeared over with the vitalizing blood substitute so that, when the spell of weakness had passed away, the sleeper might awaken, and come forth again with renewed strength from the cave-house in which he had been laid.

The many persistent legends about famous "sleepers" that survive till our own day appear to have originally been connected with a belief in the return of the dead, the antiquity of which we are not justified in limiting, especially when it is found that the beliefs connected with body paint and shell ornaments and amulets were introduced into Europe in early post-glacial times. Ancient folk heroes might be forgotten, but from Age to Age there arose new heroes to take their places; the habit of placing them among the sleepers remained. Charlemagne, Frederick of Barbarossa, William Tell, King Arthur, the Fians, and the Irish Brian Boromhe, are famous sleepers. French peasants long believed that the sleeping Napoleon would one day return to

protect their native land from invaders, and during the Russo-Japanese war it was whispered in Russia that General Skobelev would suddenly awake and hasten to Manchuria to lead their troops to victory. For many generations the Scots were convinced that James IV, who fell at Flodden, was a "sleeper". His place was taken in time by Thomas the Rhymer, who slept in a cave and occasionally awoke to visit markets so that he might purchase horses for the great war which was to redden Tweed and Clyde with blood. Even in our own day there were those who refused to believe that General Gordon, Sir Hector MacDonald, and Lord Kitchener, were really dead. The haunting belief in sleeping heroes dies hard.

Among the famous groups of sleeping heroes are the Seven Sleepers of Ephesus—the Christians who had been condemned to death by the Emperor Decius and concealed themselves in a cave where they slept for three and a half centuries. An eighteenth century legend tells of seven men in Roman attire, who lay in a cave in Western Germany. In Norse Mythology, the seven sons of Mimer sleep in the Underworld awaiting the blast of the horn, which will be blown at Ragnarok when the gods and demons will wage the last battle. The sleepers of Arabia once awoke to foretell the coming of Mahomet, and their sleeping dog, according to Moslem beliefs, is one of the ten animals that will enter Paradise.

A representative Scottish legend regarding the sleepers is located at the Cave of Craigiehowe in the Black Isle, Ross-shire, a few miles distant from the Rosemarkie cave. It is told that a shepherd once entered the cave and saw the sleepers and their dog. A horn, or as some say, a whistle, hung suspended from the roof. The shepherd blew it once and the sleepers shook themselves; he blew a second time, and they

opened their eyes and raised themselves on their elbows. Terrified by the forbidding aspect of the mighty men, the shepherd refrained from blowing a third time, but turned and fled. As he left the cave he heard one of the heroes call after him: "Alas! you have left us worse than you found us." As whistles are sometimes found in Magdalenian shelters in Western and Central Europe, it may be that these were at an early period connected with the beliefs about the calling back of the Crô-Magnon dead. The ancient whistles were made of hare-and-reindeer-foot bone. The clay whistle dates from the introduction of the Neolithic industry in Hungary.

The remarkable tendency on the part of mankind to cling to and perpetuate ancient beliefs and customs, and especially those connected with sickness and death, is forcibly illustrated by the custom of smearing the bodies of the living and dead with red ochre. In every part of the world red is regarded as a particularly "lucky colour", which protects houses and human beings, and imparts vitality to those who use it. The belief in the protective value of red berries is perpetuated in our own Christmas customs when houses are decorated with holly, and by those dwellers in remote parts who still tie rowan berries to their cows' tails so as to prevent witches and fairies from interfering with the milk supply. Egyptian women who wore a red jasper in their waist-girdles called the stone "a drop of the blood of Isis (the mother goddess)".

Red symbolism is everywhere connected with life-blood and the "vital spark"—the hot "blood of life". Brinton¹ has shown that in the North American languages the word for blood is derived from the word for red or the word for fire. The ancient Greek custom of painting red the wooden images of gods was evidently connected with the belief that a supply of life-

¹ *Myths of the New World*, p. 163.

blood was thus assured, and that the colour animated the Deity, as Homer's ghosts were animated by a blood offering when Odysseus visited Hades. "The anointing of idols with blood for the purpose of animating them is", says Farnell, "a part of old Mediterranean magic."¹ The ancient Egyptians, as has been indicated, painted their gods, some of whom wore red garments; a part of their underworld Dewat was "Red Land", and there were "red souls" in it.² In India standing stones connected with deities are either painted red or smeared with the blood of a sacrificed animal. The Chinese regard red as the colour of fire and light, and in their philosophy they identify it with *Yang*, the chief principle of life;³ it is believed "to expel pernicious influences, and thus particularly to symbolize good luck, happiness, delight, and pleasure". Red coffins are favoured. The "red gate" on the south side of a cemetery "is never opened except for the passage of an Emperor".⁴ The Chinese put a powdered red stone called *hun-hong* in a drink or in food to destroy an evil spirit which may have taken possession of one. Red earth is eaten for a similar reason by the Polynesians and others. Many instances of this kind could be given to illustrate the widespread persistence of the belief in the vitalizing and protective qualities associated with red substances. In Irish Gaelic, Professor W. J. Watson tells me, "*ruadh*" means both "red" and "strong".

The Crô-Magnons regarded the heart as the seat of life, having apparently discovered that it controls the distribution of blood. In the cavern of Pindal, in south-western France, is the outline of a hairy mammoth painted in red ochre, and the seat of life is indicated by

¹ *Cults of the Greek States*, Vol. V, p. 243.

² Budge, *Gods of the Egyptians*, Vol. I, p. 203.

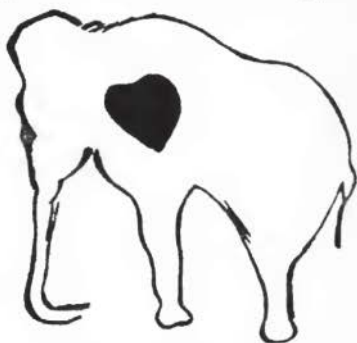
³ De Groot, *The Religious System of China*, Book I, pp. 216-7.

⁴ *Ibid.*, Book I, pp. 28 and 332.

a large red heart. The painting dates back to the early Aurignacian period. In other cases, as in the drawing of a large bison in the cavern of Niaux, the seat of life and the vulnerable parts are indicated by spear- or arrow-heads incised on the body. The ancient Egyptians identified the heart with the mind. To them the heart was the seat of intelligence and will-power as well as the seat of life. The germ of this belief can apparently be found in the pictorial art and burial customs of the Aurignacian Crô-Magnons.

Another interesting burial custom has been traced in the Grimaldi caves. Some of the skeletons were found to have small green stones between their teeth or inside their mouths.¹

No doubt these were amulets. Their colour suggests that green symbolism has not neces-



Outline of a Mammoth painted in red ochre in the Cavern of Pindal, France

The seat of life is indicated by a large red heart. (After Breuil.)

sarily a connection with agricultural religion, as some have supposed. The Crô-Magnons do not appear to have paid much attention to vegetation. In ancient Egypt the green stone (Khepera) amulet "typified the germ of life". A text says, "A scarab of green stone . . . shall be placed in the heart of a man, and it shall perform for him the 'opening of the mouth'"—that is, it will enable him to speak and eat again. The scarab is addressed in a funerary text, "My heart, my mother. My heart whereby I came into being." It is believed by

¹ I am indebted to the Abbé Breuil for this information which he gave me during the course of a conversation.

Budge that the Egyptian custom of "burying green basalt scarabs inside or on the breasts of the dead" is as old as the first Dynasty (c. 3400 B.C.).¹ How much older it is one can only speculate. "The Mexicans", according to Brinton, "were accustomed to say that at one time all men have been stones, and that at last they would all return to stones, and acting literally on this conviction they interred with the bones of the dead a small green stone, which was called 'the principle of life'."² In China the custom of placing jade tongue amulets for the purpose of preserving the dead from decay and stimulating the soul to take flight to Paradise is of considerable antiquity.³ Crystals and pebbles have been found in ancient British graves. It may well be that these pebbles were regarded as having had an intimate connection with deities, and perhaps to have been coagulated forms of what has been called "life substance". Of undoubted importance and significance was the ancient custom of adorning the dead with shells. As we have seen, this was a notable feature of the Paviland cave burial. The "Red Man" was not only smeared with red earth, but "charmed" or protected by shell amulets. In the next chapter it will be shown that this custom not only affords us a glimpse of Aurignacian religious beliefs, but indicates the area from which the Crô-Magnons came.

Professor G. Elliot Smith was the first to emphasize the importance attached in ancient times to the beliefs associated with the divine "giver of life".

¹ Budge, *Gods of the Egyptians*, Vol. I, p. 358. These scarabs have not been found in the early Dynastic graves. Green malachite charms, however, were used in even the pre-Dynastic period.

² *The Myths of the New World*, p. 294. According to Bancroft the green stones were often placed in the mouths of the dead.

³ Laufer, *Jade*, pp. 294 *et seq.* (Chicago, 1912).

CHAPTER IV

Shell Deities and Early Trade

Early Culture and Early Races—Did Civilization originate in Europe?—An Important Clue—Trade in Shells between Red Sea and Italy—Traces of Early Trade in Central Europe—Religious Value of Personal Ornaments—Importance of Shell Lore—Links between Far East and Europe—Shell Deities—A Hebridean Shell Goddess—"Milk of Wisdom"—Ancient Goddesses as Providers of Food—Gaelic "Spirit Shell" and Japanese "God Body"—Influence of Deities in Jewels, &c.—A Shakespearean Reference—Shells in Crô-Magnon Graves—Early Sacrifices—Hand Colours in Palæolithic Caves—Finger Lore and "Hand Spells".

When the question is asked, "Whence came the Crô-Magnon people of the Aurignacian phase of culture?" the answer usually given is, "Somewhere in the East". The distribution of the Aurignacian sites indicates that the new-comers entered south-western France by way of Italy—that is, across the Italian land-bridge from North Africa. Of special significance in this connection is the fact that Aurignacian culture persisted for the longest period of time in Italy. The tallest Crô-Magnons appear to have inhabited south-eastern France and the western shores of Italy. "It is probable", says Osborn, referring to the men six feet four and a half inches in height, "that in the genial climate of the Riviera these men obtained their finest development; the country was admirably protected from the cold winds of the north, refuges were abundant, and game by no means scarce, to judge from the quantity of animal bones found in the caves. Under

such conditions of life the race enjoyed a fine physical development and dispersed widely."¹

It does not follow, however, that the tall people originated Aurignacian culture. As has been indicated, the stumpy people represented by Combe-Capelle skeletons were likewise exponents of it. "It must not be assumed", as Elliot Smith reminds us, "that the Aurignacian culture was necessarily invented by the same people who introduced it into Europe, and whose remains were associated with it . . . for any culture can be transmitted to an alien people, even when it has not been adopted by many branches of the race which was responsible for its invention, just as gas illumination, oil lamps, and even candles are still in current use by the people who invented the electric light, which has been widely adopted by many foreign peoples. This elementary consideration is so often ignored that it is necessary thus to emphasize it, because it is essential for any proper understanding of the history of early civilization."²

No trace of Aurignacian culture has, so far, been found outside Europe. "May it not, therefore," it may be asked, "have originated in Italy or France?" In absence of direct evidence, this possibility might be admitted. But an important discovery has been made at Grimaldi in La Grotte des Enfants (the "grotto of infants"—so called because of the discovery there of the skeletons of young Crô-Magnon children). Among the shells used as amulets by those who used the grotto as a sepulchre was one (*Cassia rufa*) that had been carried either by a migrating folk, or by traders, along the North African coast and through Italy from some southwestern Asian beach. The find has been recorded by Professor Marcellin Boule.³

¹ *Men of the Old Stone Age*, pp. 297-8.

² *Primitive Man (Proceedings of the British Academy, Vol. VII)*.

³ *Les Grottes de Grimaldi (Bouasse-Rousse)*, Tome I, fasc. II—*Géologie et Paléontologie* (Monaco, 1906), p. 123.

In a footnote, G. Dollfus writes:

"*Cassis rufa*, L., an Indian ocean shell, is represented in the collection at Monaco by two fragments; one was found in the lower habitation level D, the other is probably of the same origin. The presence of this shell is extraordinary, as it has no analogue in the Mediterranean, neither recent nor fossil; there exists no species in the North Atlantic or off Senegal with which it could be confounded. The fragments have traces of the reddish colour preserved, and are not fossil; one of them presents a notch which has determined a hole that seems to have been made intentionally. The species has not yet been found in the Gulf of Suez nor in the raised beaches of the Isthmus. M. Jousseume has found it in the Gulf of Tadjoura at Aden, but it has not yet been encountered in the Red Sea nor in the raised beaches of that region. The common habitat of *Cassis rufa* is Socotra, besides the Seychelles, Madagascar, Mauritius, New Caledonia, and perhaps Tahiti. The fragments discovered at Mentone have therefore been brought from a great distance at a very ancient epoch by prehistoric man."

After the Crô-Magnon peoples had spread into Western and Central Europe they imported shells from the Mediterranean. At Laugerie Basse in the Dordogne, for instance, a necklace of pierced shells from the Mediterranean was found in association with a skeleton. Atlantic shells could have been obtained from a nearer seashore. It may be that the Rhone valley, which later became a well-known trade route, was utilized at an exceedingly remote period, and that cultural influences occasionally "flowed" along it. "Prehistoric man" had acquired some experience as a trader even during the "hunting period", and he had formulated definite religious beliefs.

It has been the habit of some archaeologists to refer to shell and other necklaces, &c., as "personal ornaments". The late Dr. Robert Munro wrote in this connection:

"We have no knowledge of any phase of humanity in which the love of personal ornament does not play an important part in the life of the individual. The savage of the present day, who paints or tattoos his body, and adorns it with shells, feathers, teeth, and trinkets made of the more gaudy materials at his disposal, may be accepted as on a parallel with the Neolithic people of Europe. . . . Teeth are often perforated and used as pendants, especially the canines of carnivorous animals, but such ornaments are not peculiar to Neolithic times, as they were equally prevalent among the later Palæolithic races of Europe."¹

Modern savages have very definite reasons for wearing the so-called "ornaments", and for painting and tattooing their bodies. They believe that the shells, teeth, &c., afford them protection, and bring them luck. Ear-piercing, distending the lobe of the ear, disfiguring the body, the pointing, blackening, or knocking out of teeth, are all practices that have a religious significance. Even such a highly civilized people as the Chinese perpetuate, in their funerary ceremonies, customs that can be traced back to an exceedingly remote period in the history of mankind. It is not due to "love of personal ornament" that they place cowries, jade, gold, &c., in the mouth of the dead, but because they believe that by so doing the body is protected, and given a new lease of life. The Far Eastern belief that an elixir of ground oyster shells will prolong life in the next world is evidently a relic of early shell lore. Certain deities are associated with certain shells. Some deities have, like snails, shells for "houses"; others issue at birth from shells. The goddess Venus (Aphrodite) springs from the froth of the sea, and is lifted up by Tritons on a shell; she wears a love-girdle. Hathor, the Egyptian Venus, had originally a love-girdle of shells. She appears to have originated as the personification of a

¹ *Prehistoric Britain*, pp. 132-3.

shell, and afterwards to have personified the pearl within the shell. In early Egyptian graves the shell-amulets have been found in thousands. The importance of shell lore in ancient religious systems has been emphasized by Mr. J. Wilfrid Jackson in his *Shells as Evidence of the Migrations of Early Culture*.¹ He shows why the



Necklace of Sea Shells, from the cave of Cró-Magnon. (After E. Lartet.)

cowry and snail shells were worn as amulets and charms, and why men were impelled "to search for them far and wide and often at great peril". "The murmur of the shell was the voice of the god, and the trumpet made of a shell became an important instrument in initiation ceremonies and in temple worship." Shells protected wearers against evil, including the evil eye. In like manner protection was afforded by the teeth and claws of carnivorous animals. In Asia and Africa the

¹ London, 1917.

belief that tigers, lions, &c., will not injure those who are thus protected is still quite widespread.

It cannot have been merely for love of personal ornaments that the Crô-Magnons of southern France imported Indian Ocean shells, and those of Central and Western Europe created a trade in Mediterranean shells. Like the ancient inhabitants of the Nile Valley who in remote pre-dynastic times imported shells, not only from the Mediterranean but from the Red Sea, along a long and dangerous desert trade-route, they evidently had imparted to shells a definite religious significance. The "luck-girdle" of snail-shells worn by the "Red Man of Paviland" has, therefore, an interesting history. When the Crô-Magnons reached Britain they brought with them not only implements invented and developed elsewhere, but a heritage of religious beliefs connected with shell ornaments and with the red earth with which the corpse was smeared when laid in its last resting-place.

The ancient religious beliefs connected with shells appear to have spread far and wide. Traces of them still survive in districts far separated from one another and from the area of origin—the borderlands of Asia and Africa. In Japanese mythology a young god, Ohonamochie—a sort of male Cinderella—is slain by his jealous brothers. His mother makes appeal to a sky deity who sends to her aid the two goddesses Princess Cockleshell and Princess Clam. Princess Cockleshell burns and grinds her shell, and with water provided by Princess Clam prepares an elixir called "nurse's milk" or "mother's milk". As soon as this "milk" is smeared over the young god, he is restored to life. In the Hebrides it is still the custom of mothers to burn and grind the cockle-shell to prepare a lime-water for children who suffer from what in Gaelic is called "wasting". In North America shells of *Unio* were placed in the graves

of Red Indians "as food for the dead during the journey to the land of spirits". The pearls were used in India as medicines. "The burnt powder of the gems, if taken with water, cures hæmorrhages, prevents evil spirits working mischief in men's minds, cures lunacy and all mental diseases, jaundice, &c. . . . Rubbed over the body with other medicines it cures leprosy and all skin diseases."¹ The ancient Cretans, whose culture was carried into Asia and through Europe by their enterprising sea-and-land traders and prospectors, attached great importance to the cockle-shell which they connected with their mother goddess, the source of all life and the giver of medicines and food. Sir Arthur Evans found a large number of cockle-shells, some in Faënce, in the shrine of the serpent goddess in the ruins of the Palace of Knossos. The fact that the Cretans made artificial cockle-shells is of special interest, especially when we find that in Egypt the earliest use to which gold was put was in the manufacture of models of snail-shells in a necklace.² In different countries cowrie shells were similarly imitated in stone, ivory, and metal.³

Shells were thought to impart vitality and give protection, not only to human beings, but even to the plots of the earliest florists and agriculturists. "Mary, Mary, quite contrairie", who in the nursery rhyme has in her garden "cockle-shells all in row", was perpetuating an ancient custom. The cockle-shell is still favoured by conservative villagers, and may be seen in their garden plots and in graveyards. Shells placed at cottage doors, on window-sills, and round fire-places are supposed to bring luck and give security, like the horse-shoe on the door.

The mother goddess, remembered as the fairy queen,

¹ *Shells as Evidence of the Migrations of Early Culture*, pp. 84-91.

² G. A. Reisner, *Early Dynastic Cemeteries of Naga-ed-Deh*, Vol. I, 1908, Plates 6 and 7.

³ Jackson's *Shells*, pp. 128, 174, 176, 178.

is still connected with shells in Hebridean folk-lore. A Gaelic poet refers to the goddess as "the maiden queen of wisdom who dwelt in the beauteous bower of the single tree where she could see the whole world and where no fool could see her beauty". She lamented the lack of wisdom among women, and invited them to her knoll. When they were assembled there the goddess appeared, holding in her hand the *copan Moire* ("Cup of Mary"), as the blue-eyed limpet shell is called. The shell contained "the ais (milk) of wisdom", which she gave to all who sought it. "Many", we are told, "came to the knoll too late, and there was no wisdom left for them."¹ A Gaelic poet says the "maiden queen" was attired in emerald green, silver, and mother-of-pearl.

Here a particular shell is used by an old goddess for a specific purpose. She imparts knowledge by providing a magic drink referred to as "milk". The question arises, however, if a deity of this kind was known in early times. Did the Crô-Magnons of the Aurignacian stage of culture conceive of a god or goddess in human form who nourished her human children and instructed them as do human mothers? The figure of a woman, holding in her hand a horn which appears to have been used for drinking from, is of special interest in this connection. As will be shown, the Hebridean "maiden" links with other milk-providing deities.

The earliest religious writings in the world are the

¹ Dr. Alexander Carmichael, *Carmine Gadelica*, Vol. II, pp. 227 *et seq.* Mr. Wilfrid Jackson, author of *Shells as Evidence of the Migrations of Early Culture*, tells me that the "blue-eyed limpet" is our common limpet - *Patella vulgata*—the *Lepas*, *Patelle*, *Jambe*, *Œil de boue*, *Bernicle*, or *Flie* of the French. In Cornwall it is the "Crogan", the "Bornigan", and the "Brennick". It is "flither" of the English, "flia" of the Faroese, and "lapa" of the Portuguese. A Cornish giant was once, according to a folk-tale, set to perform the hopeless task of emptying a pool with a single limpet which had a hole in it. Limpets are found in early British graves and in the "kitchen middens". They are met with in abundance in cromlechs, on the Channel Isles and in Brittany, covering the bones and the skulls of the dead. Mr. Jackson thinks they were used like cowries for vitalizing and protecting the dead.

Pyramid Texts of ancient Egypt which, as Professor Breasted so finely says, "vaguely disclose to us a vanished world of thought and speech". They abound "in allusions to lost myths, to customs and usages long since ended". Withal, they reflect the physical conditions of a particular area—the Nile Valley, in which the sun and the river are two outstanding natural features. There was, however, a special religious reason for connecting the sun and the river.

In these old Pyramid Texts are survivals from a period apparently as ancient as that of early Aurignacian civilization in Europe, and perhaps, as the clue afforded by the Indian shell found in the Grimaldi cave, not unconnected with it. The mother goddess, for instance, is prayed to so that she may suckle the soul of the dead Pharaoh as a mother suckles her child and never wean him.¹ Milk was thus the elixir of life, and as the mother goddess of Egypt is found to have been identified with the cowrie—indeed to have been the spirit or personification of the shell—the connection between shells and milk may have obtained even in Aurignacian times in south-western Europe. That the mother goddess of Crô-Magnons had a human form is suggested by the representations of mothers which have been brought to light. An Aurignacian statuette of limestone found in the cave of Willendorf, Lower Austria, has been called the "Venus of Willendorf". She is very corpulent—apparently because she was regarded as a giver of life. Other statues of like character have been unearthed near Mentone, and they have a striking resemblance to the figurines of fat women found in the pre-dynastic graves of Egypt and in Crete and Malta. The bas-relief of the fat woman sculptured on a boulder inside the Aurignacian shelter of Laussel may similarly have been a goddess. In her right hand she holds a

¹ Breasted, *Religion and Thought in Ancient Egypt*, p. 130.

bison's horn—perhaps a drinking horn containing an elixir. Traces of red colouring remain on the body. A notable fact about these mysterious female forms is that the heads are formal, the features being scarcely, if at all, indicated.

Even if no such "idols" had been found, it does not follow that the early people had no ideas about supernatural beings. There are references in Gaelic to the *coich anama* (the "spirit case", or "soul shell", or "soul husk"). In Japan, which has a particularly rich and voluminous mythology, there are no idols in Shinto temples. A deity is symbolized by the *shintai* (God body), which may be a mirror, a weapon, or a round stone, a jewel or a pearl. A pearl is a *tama*; so is a precious stone, a crystal, a bit of worked jade, or a necklace of jewels, ivory, artificial beads, &c. The soul of a supernatural being is called *mi-tama*—*mi* being now a honorific prefix, but originally signifying a water serpent (dragon god). The shells, of which ancient deities were personifications, may well have been to the Crô-Magnons pretty much what a *tama* is to the Japanese, and what magic crystals were to mediæval Europeans who used them for magical purposes. It may have been believed that in the shells, green stones, and crystals remained the influence of deities as the power of beasts of prey remained in their teeth and claws. The ear-rings and other Pagan ornaments which Jacob buried with Laban's idols under the oak at Shechem were similarly supposed to be god bodies or coagulated forms of "life substance". All idols were temporary or permanent bodies of deities, and idols were not necessarily large. It would seem to be a reasonable conclusion that all the so-called ornaments found in ancient graves were supposed to have had an intimate connection with the supernatural beings who gave origin to and sustained life. These ornaments, or

charms, or amulets, imparted vitality to human beings, because they were regarded as the substance of life itself. The red jasper worn in the waist girdles of the ancient Egyptians was reputed, as has been stated, to be a coagulated drop of the blood of the mother goddess Isis. Blood was the essence of life.

The red woman or goddess of the Laussel shelter was probably coloured so as to emphasize her vitalizing attributes; the red colour animated the image.

An interesting reference in Shakespeare's *Hamlet* to ancient burial customs may here be quoted, because it throws light on the problem under discussion. When Ophelia's body is carried into the graveyard¹ one of the priests says that as "her death was doubtful" she should have been buried in "ground unsanctified"—that is, among the suicides and murderers. Having taken her own life, she was unworthy of Christian burial, and should be buried in accordance with Pagan customs. In all our old churchyards the takers of life were interred on the north side, and apparently in Shakespeare's day traditional Pagan rites were observed in the burials of those regarded as Pagans. The priest in *Hamlet*, therefore, says of Ophelia:

She should in ground unsanctified have lodged
Till the last trumpet; *for charitable prayers,*
Shards, flints, and pebbles should be thrown on her.

There are no shards (fragments of pottery) in the Crô-Magnon graves, but flints and pebbles mingle with shells, teeth, and other charms and amulets. Vast numbers of perforated shells have been found in the burial caves near Mentone. In one case the shells are so numerous that they seem to have formed a sort of burial mantle. "Similarly," says Professor Osborn, describing another of these finds, "the female skeleton

¹ *Hamlet*, V, i.

was enveloped in a bed of shells not perforated; the legs were extended, while the arms were stretched beside the body; there were a few pierced shells and a few bits of silex. One of the large male skeletons of the same grotto had the lower limbs extended, the upper limbs folded, and was decorated with a gorget and crown of perforated shells; the head rested on a block of red stone." In another case "heavy stones protected the body from disturbance; the head was decorated with a circle of perforated shells *coloured in red*, and implements of various types were carefully placed on the forehead and chest". The body of the Combe-Capelle man "was decorated with a necklace of perforated shells and surrounded with a great number of fine Aurignacian flints. It appears", adds Osborn, "that in all the numerous burials of these grottos of Aurignacian age and industry of the Crô-Magnon race we have the burial standards which prevailed in western Europe at this time."¹

It has been suggested by one of the British archaeologists that the necklaces of perforated cowrie shells and the red pigment found among the remains of early man in Britain were used by children. This theory does not accord with the evidence afforded by the Grimaldi caves, in which the infant skeletons are neither coloured nor decorated. Occasionally, however, the children were interred in burial mantles of small perforated shells, while female adults were sometimes placed in beds of unperforated shells. Shells have been found in early British graves. These include *Nerita litoralis*, and even *Patella vulgata*, the common limpet. Holes were rubbed in them so that they might be strung together. In a megalithic cist unearthed in Phoenix Park, Dublin, in 1838, two male skeletons had each beside them perforated shells (*Nerita litoralis*). During the construction of

¹ *Men of the Old Stone Age*, pp. 304-5.

the Edinburgh and Granton railway there was found beside a skeleton in a stone cist a quantity of cockle-shell rings. Two dozen perforated oyster-shells were found in a single Orkney cist. Many other examples of this kind could be referred to.¹

In the Crô-Magnon caverns are imprints of human hands which had been laid on rock and then dusted round with coloured earth. In a number of cases it is shown that one or more finger joints of the left hand had been cut off.

The practice of finger mutilation among Bushman, Australian, and Red Indian tribes, is associated with burial customs and the ravages of disease. A Bushman woman may cut off a joint of one of her fingers when a near relative is about to die. Red Indians cut off finger-joints when burying their dead during a pestilence, so as "to cut off deaths"; they sacrificed a part of the body to save the whole. In Australia finger mutilation is occasionally practised. Highland Gaelic stories tell of heroes who lie asleep to gather power which will enable them to combat with monsters or fierce enemies. Heroines awake them by cutting off a finger joint, a part of the ear, or a portion of skin from the scalp.²

The colours used in drawings of hands in Palæolithic caves are black, white, red, and yellow, as the Abbé Breuil has noted. In Spain and India, the hand prints are supposed to protect dwellings from evil influences. Horse-shoes, holly with berries, various plants, shells, &c., are used for a like purpose among those who in our native land perpetuate ancient customs.

The Arabs have a custom of suspending figures of an

¹ A Red Sea cowry shell (*Cypræa minor*) found on the site of Hurstbourne station (L. & S. W. Railway, main line) in Hampshire, was associated with "Early Iron Age" artifacts. (Paper read by J. R. le B. Tomlin at meeting of Linnæan Society, June 14, 1911.)

² For references see my *Myths of Crete and Pre-Hellenic Europe*, pp. 30-31.

open hand from the necks of their children, and the Turks and Moors paint hands upon their ships and houses, "as an antidote and counter charm to an evil eye; for five is with them an unlucky number; and 'five (fingers, perhaps) in your eyes' is their proverb of cursing and defiance". In Portugal the hand spell is called the *figa*. Southey suggests that our common phrase "a fig for him" was derived from the name of the Portuguese hand amulet.¹

"The figo for thy friendship" is an interesting reference by Shakespeare.² Fig or figo is probably from *fico*, a snap of the fingers, which in French is *faire la figue*, and in Italian *far le fiche*. Finger snapping had no doubt originally a magical significance.

¹ Notes to *Thalaba*, Book V, Canto 36.

² *Henry IV*, V, iii, 6.

CHAPTER V

New Races in Europe

The Solutrean Industry—A Racial and Cultural Intrusion—Decline of Aurignacian Art—A God-cult—The Solutrean Thor—Open-air Life—Magdalenian Culture—Decline of Flint Working—Horn and Bone Weapons and Implements—Revival of Crô-Magnon Art—The Lamps and Palettes of Cave Artists—The Domesticated Horse—Eskimos in Europe—Magdalenian Culture in England—The Vanishing Ice—Reindeer migrate Northward—New Industries—Tardenoisian and Azilian Industries—Pictures and Symbols of Azilians—"Long-heads" and "Broad-heads"—Maglemosian Culture of Fair Northerners—Pre-Neolithic Peoples in Britain.

In late Aurignacian times the influence of a new industry was felt in Western Europe. It first came from the south, and reached as far north as England where it can be traced in the caverns. Then, in time, it spread westward and wedge-like through Central Europe in full strength, with the force and thoroughness of an invasion, reaching the northern fringe of the Spanish coast. This was the Solutrean industry which had distinctive and independent features of its own. It was not derived from Aurignacian but had developed somewhere in Africa—perhaps in Somaliland, whence it radiated along the Libyan coast towards the west and eastward into Asia. The main or "true" Solutrean influence entered Europe from the south-east. It did not pass into Italy, which remained in the Aurignacian stage until Azilian times, nor did it cross the Pyrenees or invade Spain south of the Cantabrian Mountains. The earlier "influence" is referred to as "proto-Solutrean".

Solutrean is well represented in Hungary where no trace of Aurignacian culture has yet been found. Apparently that part of Europe had offered no attractions for the Crô-Magnons.

Who the carriers of this new culture were it is as yet impossible to say with confidence. They may have been a late "wave" of the same people who had first introduced Aurignacian culture into Europe, and they may have been representative of a different race. Some ethnologists incline to connect the Solutrean culture with a new people whose presence is indicated by the skulls found at Brünn and Brûx in Bohemia. These intruders had lower foreheads than the Crô-Magnons, narrower and longer faces, and low cheek-bones. It may be that they represented a variety of the Mediterranean race. Whoever they were, they did not make much use of ivory and bone, but they worked flint with surpassing skill and originality. Their technique was quite distinct from the Aurignacian. With the aid of wooden or bone tools, they finished their flint artifacts by pressure, gave them excellent edges and points, and shaped them with artistic skill. Their most characteristic flints are the so-called laurel-leaf (broad) and willow-leaf (narrow) lances. These were evidently used in the chase. There is no evidence that they were used in battle. Withal, their weapons had a religious significance. Fourteen laurel-leaf spear-heads of Solutrean type which were found together at Volgu, Saône-et-Loire, are believed to have been a votive offering to a deity. At any rate, these were too finely worked and too fragile, like some of the peculiar Shetland and Swedish knives of later times, to have been used as implements. One has retained traces of red colouring. It may be that the belief enshrined in the Gaelic saying, "Every weapon has its demon", had already come into existence. In Crete the double-axe was in Minoan times

a symbol of a deity;¹ and in northern Egypt and on the Libyan coast the crossed arrows symbolized the goddess Neith; while in various countries, and especially in India, there are ancient stories about the spirits of weapons appearing in visions and promising to aid great hunters and warriors. The custom of giving weapons personal names, which survived for long in Europe, may have had origin in Solutrean times.

Art languished in Solutrean times. Geometrical figures were incised on ivory and bone; some engraving of mammoths, reindeer, and lions have been found in Moravia and France. When the human figure was depicted, the female was neglected and studies made of males. It may be that the Solutreans had a god-cult as distinguished from the goddess-cult of the Aurignacians, and that their "flint-god" was an early form of Zeus, or of Thor, whose earliest hammer was of flint. The Romans revered "Jupiter Lapis" (silex). When the solemn oath was taken at the ceremony of treaty-making, the representative of the Roman people struck a sacrificial pig with the *silex* and said, "Do thou, Diespiter, strike the Roman people as I strike this pig here to-day, and strike them the more, as thou art greater and stronger". Mr. Cyril Bailey (*The Religion of Ancient Rome*, p. 7) expresses the view that "in origin the stone is itself the god".

During Solutrean times the climate of Europe, although still cold, was drier than in Aurignacian times. It may be that the intruders seized the flint quarries of the Crô-Magnons, and also disputed with them the possession of hunting-grounds. The cave art declined or was suspended during what may have been a military regime and perhaps, too, under the influence of a new religion and new social customs. Open-air camps

¹ For other examples see Mr. Legge's article in *Proceedings of the Society of Biblical Archaeology*, 1899, p. 310.

beside rock-shelters were greatly favoured. It may be, as has been suggested, that the Solutreans were as expert as the modern Eskimos in providing clothing and skin-tents. Bone needles were numerous. They fed well, and horse-flesh was a specially favoured food.

In their mountain retreats, the Aurignacians may have concentrated more attention than they had previously done on the working of bone and horn; it may be that they were reinforced by new races from north-eastern Europe, who had been developing a distinctive industry on the borders of Asia. At any rate, the industry known as Magdalenian became widespread when the ice-fields crept southward again, and southern and central Europe became as wet and cold as in early Aurignacian times. Solutrean culture gradually declined and vanished and Magdalenian became supreme.

The Magdalenian stage of culture shows affinities with Aurignacian and betrays no influence of Solutrean technique. The method of working flint was quite different. The Magdalenians, indeed, appear to have attached little importance to flint for implements of the chase. They often chipped it badly in their own way and sometimes selected flint of poor quality, but they had beautiful "scrapers" and "gravers" of flint. It does not follow, however, that they were a people on a lower stage of culture than the Solutreans. New inventions had rendered it unnecessary for them to adopt Solutrean technique. Most effective implements of horn and bone had come into use and, if wars were waged—there is no evidence of warfare—the Magdalenians were able to give a good account of themselves with javelins and exceedingly strong spears which were given a greater range by the introduction of spear-throwers—"cases" from which spears were thrown. The food supply was increased by a new method of catching fish. Barbed harpoons of reindeer-horn had been invented, and no

doubt many salmon, &c., were caught at river-side stations.

The Crô-Magnons, as has been found, were again in the ascendant, and their artistic genius was given full play as in Aurignacian times, and, no doubt, as a result of the revival of religious beliefs that fostered art as a cult product. Once again the painters, engravers, and sculptors adorned the caves with representations of wild animals. Colours were used with increasing skill and taste. The artists had palettes on which to mix their colours, and used stone lamps, specimens of which have been found, to light up their "studios" in deep cave recesses. During this Magdalenian stage of culture the art of the Crô-Magnons reached its highest standard of excellence, and grew so extraordinarily rich and varied that it compares well with the later religious arts of ancient Egypt and Babylonia.

The horse appears to have been domesticated. There is at Saint Michel d'Arudy a "Celtic" horse depicted with a bridle, while at La Madeleine was found a "bâton de commandement" on which a human figure, with a stave in his right hand, walks past two horses which betray no signs of alarm.

Our knowledge is scanty regarding the races that occupied Europe during Magdalenian times. In addition to the Crô-Magnons there were other distinctive types. One of these is represented by the Chancelade skeleton found at Raymondén shelter. Some think it betrays Eskimo affinities, and represents a racial "drift" from the Russian steppes. In his *Ancient Hunters* Professor Sollas shows that there are resemblances between Eskimo and Magdalenian artifacts.

The Magdalenian culture reached England, although it never penetrated into Italy, and was shut out from the greater part of Spain. It has been traced as far north as Derbyshire, on the north-eastern border of which the

Cresswell caves have yielded Magdalenian relics, including flint-borers, engravers, &c., and bone implements, including a needle, an awl, chisels, an engraving of a horse on bone, &c. Kent's Cavern, near Torquay in Devonshire, has also yielded Magdalenian flints and implements of bone, including pins, awls, barbed harpoons, &c.

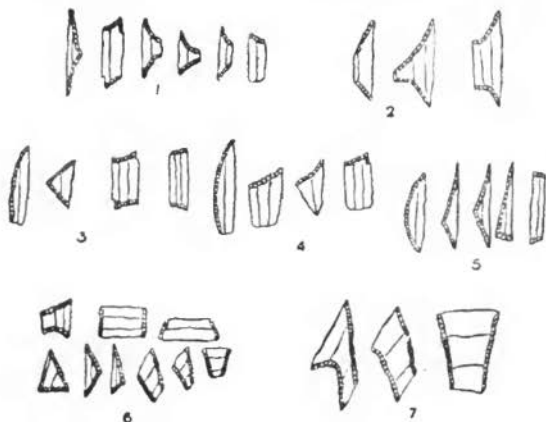
During early Magdalenian times, however, our native land did not offer great attractions to Continental people. The final glacial epoch may have been partial, but it was severe, and there was a decided lowering of the temperature. Then came a warmer and drier spell, which was followed by the sixth partial glaciation. Thereafter the "great thaw" opened up Europe to the invasion of new races from Asia and Africa.

Three distinct movements of peoples in Europe can be traced in post-Magdalenian times, and during what has been called the "Transition Period", between the Upper Palæolithic and Lower Neolithic Ages or stages. The ice-cap retreated finally from the mountains of Scotland and Sweden, and the reindeer migrated northward. Magdalenian civilization was gradually broken up, and the cave art suffered sharp decline until at length it perished utterly. Trees flourished in areas where formerly the reindeer scraped the snow to crop moss and lichen, and rich pastures attracted the northward migrating red deer, the roe-deer, the ibex, the wild boar, wild cattle, &c.

The new industries are known as the Tardenoisian, the Azilian, and the Maglemosian.

Tardenoisian flints are exceedingly small and beautifully worked, and have geometric forms; they are known as "microliths" and "pygmy flints". They were evidently used in catching fish, some being hooks and others spear-heads; and they represent a culture that spread round the Mediterranean basin: these flints are

found in northern Egypt, Tunis, Algeria, and Italy; from Italy they passed through Europe into England and Scotland. A people who decorated with scenes of daily life rock shelters and caves in Spain, and hunted red deer and other animals with bows and arrows, were pressing northward across the new grass-lands towards the old Magdalenian stations. Men wore pants and



Geometric or "Pygmy" Flints. (After Breuil.)

- 1, From Tunis and Southern Spain. 2, From Portugal. 3, 4, Azilian types.
5, 6, 7, Tardenoisian types.

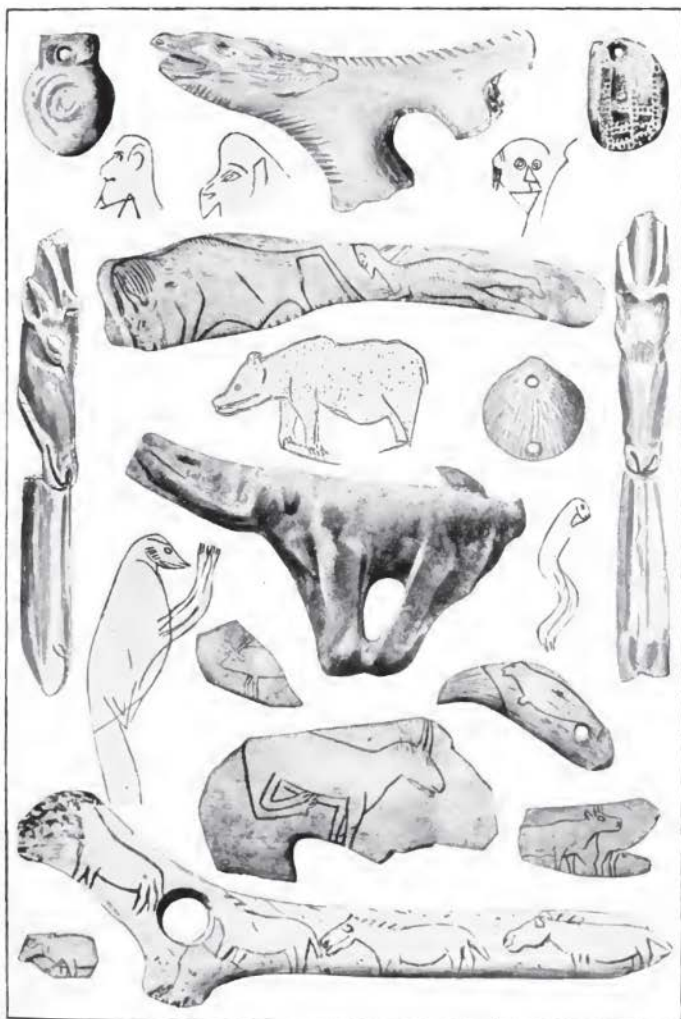
feather head-dresses; women had short gowns, blouses, and caps, as had the late Magdalenians, and both sexes wore armlets, anklets, and other ornaments of magical potency. Females were nude when engaged in the chase. The goddess Diana had evidently her human prototypes. There were ceremonial dances, as the rock pictures show; women lamented over graves, and affectionate couples—at least they seem to have been affectionate—walked hand in hand as they gradually migrated towards northern Spain, and northern France and Britain. The horse was domesticated, and is seen being

led by the halter. Wild animal "drives" were organized, and many victims fell to archer and spearman. Arrows were feathered; bows were large and strong. Symbolic signs indicate that a script similar to those of the Ægean area, the northern African coast, and pre-dynastic Egypt was freely used. Drawings became conventional, and ultimately animals and human beings were represented by signs. This culture lasted after the introduction of the Neolithic industry in some areas, and in others after the bronze industry had been adopted by sections of the people.

When the Magdalenian harpoon of reindeer horn was imitated by the flat harpoon of red-deer horn, this new culture became what is known as Azilian. It met and mingled with Tardenoisian, which appears to have arrived later, and the combined industries are referred to as Azilian-Tardenoisian.

While the race-drifts, represented by the carriers of the Azilian and Tardenoisian industries, were moving into France and Britain, another invasion from the East was in progress. It is represented in the famous Ofnet cave where long-heads and broad-heads were interred. The Asiatic Armenoids (Alpine type) had begun to arrive in Europe, the glaciers having vanished in Asia Minor. Skulls of broad-heads found in the Belgian cave of Furfooz, in which sixteen human skeletons were unearthed in 1867, belong to this period. The early Armenoids met and mingled with representatives of the blond northern race, and were the basis of the broad-headed blonds of Holland, Denmark, and Belgium.

Maglemosian culture is believed to have been introduced by the ancestors of the fair peoples of Northern Europe. It has been so named after the finds at Maglemose in the "Great Moor", near Mullerup, on the western coast of Zeeland. A lake existed at this place at a time when the Baltic was an inland water completely



EXAMPLES OF PALÆOLITHIC ART

The objects include: handles of knives and daggers carved in ivory and bone, line drawings of wild animals, faces of masked men, of animal-headed deity or masked man with arms uplifted (compare Egyptian "Ka" attitude of adoration), of wild horses on perforated *baton de commandement*, of man stalking a bison, of seal, cow, reindeer, cave bear, &c., and perforated amulets.

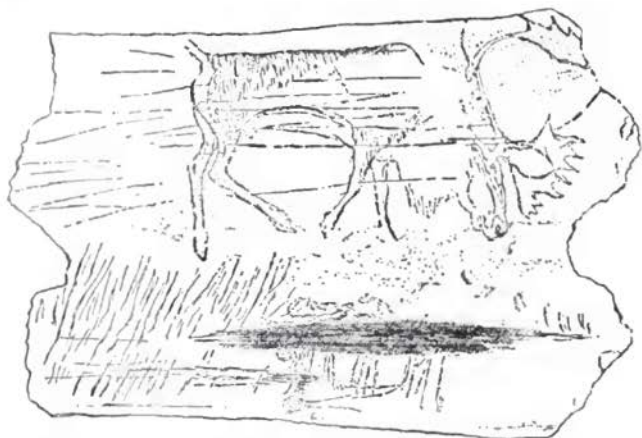


shut off from the North Sea. In a peat bog, formerly the bed of the lake, were found a large number of flint and bone artifacts. These included Tardenoisian microliths, barbed harpoons of bone, needles of bone, spears of bone, &c. Bone was more freely used than horn for implements and weapons. The animals hunted included the stag, roe-deer, moose, wild ox, and wild boar. Dogs were domesticated. It appears that the Maglemosians were lake-dwellers. Their houses, however, had not been erected on stilts, but apparently on a floating platform of logs, which was no doubt anchored or moored to the shore. There are traces of Magdalenian influence in Maglemosian culture. Although many decorative forms on bone implements and engravings on rocks are formal and symbolic, there are some fine and realistic representations of animals worthy of the Magdalenian cave artists. Traces of the Maglemosian racial drift have been obtained on both sides of the Baltic and in the Danish kitchen middens. Engravings on rocks at Lake Onega in Northern Russia closely resemble typical Maglemosian work. Apparently the northern fair peoples entered Europe from Western Siberia, and in time were influenced by Neolithic culture. But before the Europeans began to polish their stone implements and weapons, the blond hunters and fishermen settled not only in Denmark and Southern Sweden and Norway but also in Britain.

At the time when the Baltic was an inland fresh-water lake, the southern part of the North Sea was dry land, and trees grew on Dogger Bank, from which fishermen still occasionally lift in their trawls lumps of "moor-log" (peat) and the bones of animals, including those of the reindeer, the red deer, the horse, the wild ox, the bison, the Irish elk, the bear, the wolf, the beaver, the woolly rhinoceros, the mammoth, and the walrus. No doubt the Maglemosians found their way over this "land-

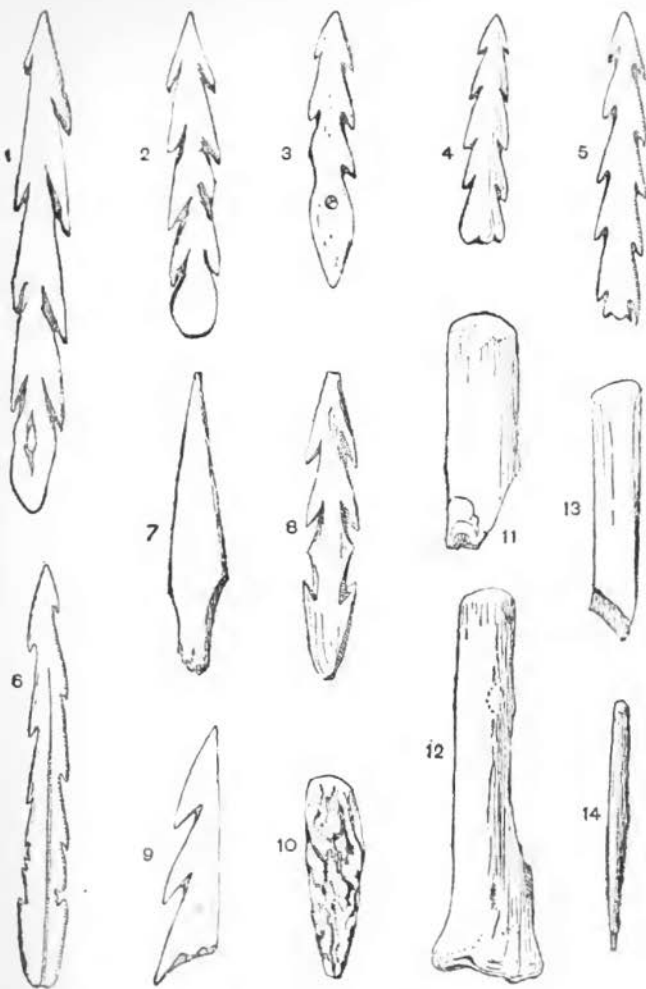
bridge", crossing the rivers in rude boats, and on foot when the rivers were frozen. Evidence has been forthcoming that they also followed the present coast line towards Boulogne, near which a typical Maglemosian harpoon has been discovered.

Traces of Maglemosian influence have been found as far north as Scotland on the Hebridean islands of



A Notable Example of late Magdalenian Culture: engraving on bone of browsing reindeer. From Kesslerloch, Switzerland. (After Heim.)

Oronsay and Risga. The MacArthur cave at Oban reveals Azilian artifacts. In the Victoria cave near Settle in Yorkshire a late Magdalenian or proto-Azilian harpoon made of reindeer-horn is of special interest, displaying, as it does, a close connection between late Magdalenian and early Azilian. Barbed harpoons, found at the shelter of Druimvargie, near Oban, are Azilian, some displaying Maglemosian features. Barbed harpoons of bone, and especially those with barbs on one side only, are generally Maglemosian, while those of horn and double-barbed are typically Azilian.



Horn and Bone Implements

Harpoons: 1 and 2, from MacArthur Cave, Oban; 3, from Laugerie Basse rock-shelter, France; 4, from shell-heap, Oronsay, Hebrides; 5, from bed of River Dee near Kirkcudbright; 6, from Palude Brabbie, Italy—all of Azilian type. 8, Reindeer-horn harpoon of late Magdalenian, or proto-Azilian, type from Victoria Cave, near Settle, Yorks. 9, Maglemosian, or Azilian-Maglemosian, harpoon from rock-shelter, Druimvargie, Oban. 7, 10, 11, 12, 13, and 14, bone and deer-horn implements from MacArthur Cave, Oban.

Apparently the fair Northerners, the carriers of Maglemosian culture, and the dark Iberians, the carriers of Azilian culture, met and mingled in Scotland and England long before the Neolithic industry was introduced. There were also, it would appear, communities in Britain of Crô-Magnons, and perhaps of other racial types that existed on the Continent and in late Magdalenian times. The fair peoples of England and Wales, Scotland and Ireland are not therefore all necessarily descendants of Celts, Angles, Saxons, and Vikings. The pioneer settlers in the British Isles, in all probability, included blue and grey-eyed and fair or reddish-haired peoples who in Scotland may have formed the basis of the later Caledonian type, compared by Tacitus to the Germans, but bearing an undoubted Celtic racial name, the military aristocrats being Celts.¹

¹The Abbé Breuil, having examined the artifacts associated with the Western Scottish harpoons, inclines to refer to the culture as "Azilian-Tardenoisian". At the same time he considers the view that Maglemosian influence was operating is worthy of consideration. He notes that traces of Maglemosian culture have been reported from England. The Abbé has detected Magdalenian influence in artifacts from Campbeltown, Argyllshire (*Proceedings of the Society of Antiquaries in Scotland*, 1921-2).

CHAPTER VI

The Faithful Dog

Transition Period between Palæolithic and Neolithic Ages—Theory of the Neolithic Edge—Crô-Magnon Civilization was broken up by Users of Bow and Arrow—Domesticated Dog of Fair Northerners—Dogs as Guides and Protectors of Man—The Dog in Early Religion—Dog Guides of Souls—The Dog of Hades—Dogs and Death—The Scape-dog in Scotland—Souls in Dog Form—Traces of Early Domesticated Dogs—Romans imported British Dogs.

The period we have now reached is regarded by some as that of transition between the Palæolithic and Neolithic Ages, and by others as the Early Neolithic period. It is necessary, therefore, that we should keep in mind that these terms have been to a great extent divested of the significance originally attached to them. The transition period was a lengthy one, extending over many centuries during which great changes occurred. It was much longer than the so-called "Neolithic Age". New races appeared in Europe and introduced new habits of life and thought, new animals appeared and animals formerly hunted by man retreated northward or became extinct; the land sank and rose; a great part of the North Sea and the English Channel was for a time dry land, and trees grew on the plateau now marked by the Dogger Bank during this "Transition Period", and before it had ended the Strait of Dover had widened and England was completely cut off from the Continent.

Compared with these great changes the invention of the polished axe edge seems almost trivial. Yet some

writers have regarded this change as being all-important. "On the edge ever since its discovery", writes one of them with enthusiasm, "has depended and probably will depend to the end of time the whole artistic and artificial environment of human existence, in all its infinite varied complexity. . . . By this discovery was broken down a wall that for untold ages had dammed up a stagnant, unprogressive past, and through the breach were let loose all the potentialities of the future civilization of mankind. It was entirely due to the discovery of the edge that man was enabled, in the course of time, to invent the art of shipbuilding."¹

This is a very sweeping claim and hardly justified by the evidence that of late years has come to light. Much progress had been achieved before the easy method of polishing supplanted that of secondary working. The so-called Palæolithic implements were not devoid of edges. What really happened was that flint-working was greatly simplified. The discovery was an important one, but it was not due to it alone that great changes in habits of life were introduced. Long before the introduction of the Neolithic industry, the earliest traces of which in Western Europe have been obtained at Campigny near the village of Blangy on the River Bresle, the Magdalenian civilization of the Crô-Magnons had been broken up by the Azilian-Tardenoisian intruders in Central and Western Europe and by the Maglemosians in the Baltic area.

The invading hordes in Spain, so far as can be gathered from rock pictures, made more use of bows and arrows than of spears, and it may be that their social organization was superior to that of the Magdalenians. Their animal "drives" suggest as much. It may be that they were better equipped for organized warfare—if there was warfare—and for hunting by organizing

¹ Erik Magnusson in *Notes on Shipbuilding and Nautical Terms*, London, 1906.

drives than the taller and stronger Crô-Magnons. When they reached the Magdalenian stations they adopted the barbed harpoon, imitating reindeer-horn forms in red-deer horn.

The blond Maglemosians in the Baltic area introduced from Asia the domesticated dog. They were thus able to obtain their food supply with greater ease than did the Solutreans with their laurel-leaf lances, or the Magdalenians with their spears tipped with bone or horn. When man was joined by his faithful ally he met with more success than when he pursued the chase unaided. Withal, he could take greater risks when threatened by the angry bulls of a herd, and operate over more extended tracks of country with less fear of attack by beasts of prey. His dogs warned him of approaching peril and guarded his camp by night.

Hunters who dwelt in caves may have done so partly for protection against lions and bears and wolves that were attracted to hunters' camps by the scent of flesh and blood. No doubt barriers had to be erected to shield men, women, and children in the darkness; and it may be that there were fires and sentinels at cave entrances.

The introduction of the domesticated dog may have influenced the development of religious beliefs. Crô-Magnon hunters appear to have performed ceremonies in the depths of caverns where they painted and carved wild animals, with purpose to obtain power over them. Their masked dances, in which men and women represented wild animals, chiefly beasts of prey, may have had a similar significance. The fact that, during the Transition Period, a cult art passed out of existence, and the caves were no longer centres of culture and political power, may have been directly or indirectly due to the domestication of the dog and the supremacy achieved by the intruders who possessed it.

There can be no doubt that the dog played its part in the development of civilization. As much is suggested by the lore attaching to this animal. It occupies a prominent place in mythology. The dog which guided and protected the hunter in his wanderings was supposed to guide his soul to the other world.

He thought admitted to that equal sky,
His faithful dog would bear him company.

In Ancient Egypt the dog-headed god Anubis was the guide and protector of souls. Apuatua, an early form of Osiris, was a dog god. Yama, the Hindu god of death, as Dharma, god of justice, assumed his dog form to guide the Panadava brothers to Paradise, as is related in the Sanskrit epic the *Mahá-bhárata*¹. The god Indra, the Hindu Jupiter, was the "big dog", and the custom still prevails among primitive Indian peoples of torturing a dog by pouring hot oil into its ears so that the "big dog" may hear and send rain. In the *Mahá-bhárata* there is a story about Indra appearing as a hunter followed by a pack of dogs. As the "Wild Huntsman" the Scandinavian god Odin rides through the air followed by dogs. The dog is in Greek mythology the sentinel of Hades; it figures in a like capacity in the Hades of Northern Mythology. Cuchullin, the Gaelic hero, kills the dog of Hades and takes its place until another dog is found and trained, and that is why he is called "Cu" (the dog) of Culann. A pool in Kildonan, Sutherland, which was reputed to contain a pot of gold, was supposed to be guarded by a big black dog with two heads. A similar legend attaches to Hound's Pool in the parish of Dean Combe, Devonshire. In different parts of the world the dog is the creator and ancestor of the human race, the symbol of kinship, &c. The star Sirius was associated with the dog. In Scotland and

¹ Pronounced ma-haw'-haw'-rata (the two final *a*'s are short).

Ireland "dog stones" were venerated. A common surviving belief is that dogs howl by night when a sudden death is about to occur. This association of the dog with death is echoed by Theocritus. "Hark!" cries Simaetha, "the dogs are barking through the town. Hecate is at the crossways. Haste, clash the brazen cymbals." The dog-god of Scotland is remembered as *an cù sìth* ("the supernatural dog"); it is as big as a calf, and by night passes rapidly over land and sea. A black demon-dog—the "Moddey Dhoo"—referred to by Scott in *Peveril of the Peak* was supposed to haunt Peel Castle in the Isle of Man. A former New Year's day custom in Perthshire was to send away from a house door a scape-dog with the words, "Get away you dog! Whatever death of men or loss of cattle would happen in this house till the end of the present year, may it all light on your head." A similar custom obtained among Western Himalayan peoples. Early man appears to have regarded his faithful companion as a supernatural being. There are Gaelic references to souls appearing in dog form to assist families in time of need. Not only did the dog attack beasts of prey; in Gaelic folk-tales it is the enemy of fairies and demons, and especially cave-haunting demons. Early man's gratitude to and dependence on the dog seems to be reflected in stories of this kind.

When the Baltic peoples, who are believed to be the first "wave" of blond Northerners, moved westward towards Denmark during the period of the "great thaw", they must have been greatly assisted by the domesticated dog, traces of which are found in Maglemosian stations. Bones of dogs have been found in the Danish kitchen middens and in the MacArthur cave at Oban. It may be that the famous breed of British hunting dogs which were in Roman times exported to Italy were descended from those introduced by the Maglemosian hunters.

Seven Irish dogs were in the fourth century presented to Symmachus, a Roman consul, by his brother. "All Rome", the grateful recipient wrote, "view them with wonder and thought they must have been brought hither in iron cages."

Great dogs were kept in Ancient Britain and Ireland for protection against wolves as well as for hunting wild animals. The ancient Irish made free use in battle of large fierce hounds. In the folk-stories of Scotland dogs help human beings to attack and overcome supernatural beings. Dogs were the enemies of the fairies, mermaids, &c.

Dog gods figure on the ancient sculptured stones of Scotland. The names of the Irish heroes Cuchullin and Con-chobar were derived from those of dog deities. "Con" is the genitive of "Cu" (dog).

CHAPTER VII

Ancient Mariners Reach Britain

Reindeer in Scotland—North Sea and English Channel Land-bridges—Early River Rafts and River Boats—Breaking of Land-bridges—Coast Erosion—Tilbury Man—Where were first Boats Invented?—Ancient Boats in Britain—"Dug-out" Canoes—Imitations of Earlier Papyri and Skin Boats—Cork Plug in Ancient Clyde Boat—Early Swedish Boats—An African Link—Various Types of British Boats—Daring Ancient Mariners—The Veneti Seafarers—Attractions of Early Britain for Colonists.

The Maglemosian (Baltic) and Azilian (Iberian) peoples, who reached and settled in Britain long before the introduction of the Neolithic industry, appear, as has been shown, to have crossed the great land-bridge, which is now marked by the Dogger Bank, and the narrowed land-bridge that connected England and France. No doubt they came at first in small bands, wandering along the river banks and founding fishing communities, following the herds of red deer and wild cows that had moved northward, and seeking flints, &c. The Crô-Magnons, whose civilization the new intruders had broken up on the Continent, were already in Britain, where the reindeer lingered for many centuries after they had vanished from France. The reindeer moss still grows in the north of Scotland. Bones and horns of the reindeer have been found in this area in association with human remains as late as of the Roman period. In the twelfth century the Norsemen hunted reindeer in

Caithness.¹ Cæsar refers to the reindeer in the Hercynian forest of Germany (*Gallie War*, VI, 26).

The early colonists of fair Northerners who introduced the Maglemosian culture into Britain from the Baltic area could not have crossed the North Sea land-bridge without the aid of rafts or boats. Great broad rivers were flowing towards the north. The Elbe and the Weser joined one another near the island of Heligoland, and received tributaries from marshy valleys until a long estuary wider than is the Wash at present was formed. Another long river flowed northward from the valley of the Zuyder Zee, the mouth of which has been traced on the north-east of the Dogger Bank. The Rhine reached the North Sea on the south-west of the Dogger Bank, off Flamborough Head; its tributaries included the Meuse and the Thames. The Humber and the rivers flowing at present into the Wash were united before entering the North Sea between the mouth of the Rhine and the coast of East Riding.

The Dogger Bank was then a plateau. Trawlers, as has been stated, sometimes lift from its surface in their trawl nets lumps of peat, which they call "moor-log", and also the bones of wild animals, including the wild ox, the wild horse, red deer, reindeer, the elk, the bear, the wolf, the hyæna, the beaver, the walrus the woolly rhinoceros, and the hairy mammoth. In the peat have been found the remains of the white birch, the hazel, sallow, and willow, seeds of bog-bean, fragments of fern, &c. All the plants have a northern range. In some pieces of peat have been found plants and insects that still flourish in Britain.²

The easiest crossing to Britain was over the English Channel land-bridge. It was ultimately cut through by

¹ *The Orkneyinga Saga*, p. 182, Edinburgh, 1873, and *Proceedings of the Society of Antiquaries of Scotland*, Vol. VIII.

² Clement Reid, *Submerged Forests*, pp. 45-7, London, 1913.

the English Channel river, so that the dark Azilian-Tardenoisian peoples from Central and Western Europe and the fair Maglemosians must have required and used rafts or boats before polished implements of Neolithic type came into use. In time the North Sea broke through the marshes of the river land to the east of the Thames Estuary and joined the waters of the English Channel. The Strait of Dover was then formed. At first it may have been narrow enough for animals to swim across or, at any rate, for the rude river boats or rafts of the early colonists to be paddled over in safety between tides. Gradually, however, the strait grew wider and wider; the chalk cliffs, long undermined by boring molluscs and scouring shingle, were torn down by great billows during winter storms.

It may be that for a long period after the North Sea and English Channel were united, the Dogger Bank remained an island, and that there were other islands between Heligoland and the English coast. Pliny, who had served with the Roman army in Germany, writing in the first century of our era, refers to twenty-three islands between the Texel and the Eider in Schleswig-Holstein. Seven of these have since vanished. The west coast of Schleswig has, during the past eighteen hundred years, suffered greatly from erosion, and alluvial plains that formerly yielded rich harvests are now represented by sandbanks. The Goodwin Sands, which stretch for about ten miles off the Kentish coast, were once part of the fertile estate of Earl Godwin which was destroyed and engulfed by a great storm towards the end of the eleventh century. The Gulf of Zuyder Zee was formerly a green plain with many towns and villages. Periodic inundations since the Roman period have destroyed flourishing Dutch farms and villages and eaten far into the land. There are records of storm-floods that drowned on one occasion 20,000, and on another no

fewer than 100,000 inhabitants.¹ It is believed that large tracts of land, the remnants of the ancient North Sea land-bridge, have been engulfed since about 3000 B.C., as a result not merely of erosion but the gradual submergence of the land. This date is suggested by Mr. Clement Reid.

"The estimate", he says, "may have to be modified as we obtain better evidence; but it is as well to realize clearly that we are not dealing with a long period of great geological antiquity; we are dealing with times when the Egyptian, Babylonian, and Minoan (Cretan) civilizations flourished. Northern Europe was then probably barbarous, and metals had not come into use;² but the amber trade of the Baltic was probably in full swing. Rumours of any great disaster, such as the submergence of thousands of square miles and the displacement of large populations, might spread far and wide along the trade routes." It may be that the legend of the Lost Atlantis was founded on reports of such a disaster, that must have occurred when areas like the Dogger Bank were engulfed. It may be too that the gradual wasting away of lands that have long since vanished propelled migrations of peoples towards the smiling coasts of England. According to Ammianus the Druids stated that some of the inhabitants of Gaul were descendants of refugees from sea-invaded areas.

The gradual sinking of the land and the process of coast erosion has greatly altered the geography of England. The beach on which Julius Cæsar landed has long since vanished, the dwellings of the ancient Azilian and Maglemosian colonists, who reached England in post-Glacial times, have been sunk below the English Channel. When Tilbury Docks were being excavated

¹ The dates of the greatest disasters on record are 1421, 1532, and 1570. There were also terrible inundations in the seventeenth and eighteenth centuries, and in 1825 and 1855.

² It was not necessarily barbarous because metal weapons had not been invented.

Roman remains were found embedded in clay several feet below high-water mark. Below several layers of peat and mud, and immediately under a bank of sand in which were fragments of decomposed wood, was found the human skeleton known as "Tilbury man". The land in this area was originally 80 feet above its present level.¹ But while England was sinking Scotland was rising. The MacArthur cave at Oban, in which Azilian hunters and fishermen made their home on the sea-beach, is now about 30 feet above the old sea-level.

Before Dover Strait had been widened by the gradual sinking of the land and the process of coast erosion, and before the great islands had vanished from the southern part of the North Sea, the early hunters and fishermen could have experienced no great difficulty in reaching England. It is possible that the Azilian, Tardenoisian, and Maglemosian peoples had made considerable progress in the art of navigation. Traces of the Tardenoisian industry have been obtained in Northern Egypt, along the ancient Libyan coast of North Africa where a great deal of land has been submerged, and especially at Tunis, and in Algiers, in Italy, and in England and Scotland, as has been noted. There were boats on the Mediterranean at a very early period. The island of Crete was reached long before the introduction of copper-working by seafarers who visited the island of Melos, and there obtained obsidian (natural glass) from which sharp implements were fashioned. Egyptian mariners, who dwelt on the Delta coast, imported cedar, not only from Lebanon but from Morocco, as has been found from the evidence afforded by mummies packed with the sawdust of cedar from the Atlas Mountains.² When this trade with Morocco began it is impossible to say

¹ *Submerged Forests*, p. 120.

² *The Cairo Scientific Journal*, Vol. III. No. 32 (May, 1909), p. 105.

with certainty. Long before 3000 B.C., however, the Egyptians were building boats that were fitted with masts and sails. The ancient mariners were active as explorers and traders before implements of copper came into use.

Here we touch on a very interesting problem. Where were boats first invented and the art of navigation developed? Rafts and floats formed by tying together two trees or, as in Egypt, two bundles of reeds, were in use at a very early period in various countries. In Babylonia the "kufa", a great floating basket made watertight with pitch or covered with skins, was an early invention. It was used as it still is for river ferry boats. But ships were not developed from "kufas". The dug-out canoe is one of the early prototypes of the modern ocean-going vessel. It reached this country before the Neolithic industry was introduced, and during that period when England was slowly sinking and Scotland was gradually rising. Dug-out canoes continued to come during the so-called "Neolithic" stage of culture ere yet the sinking and rising of land had ceased. "That Neolithic man lived in Scotland during the formation of this beach (the 45- to 50-foot beach) is proved", wrote the late Professor James Geikie, "by the frequent occurrence in it of his relics. At Perth, for example, a dug-out canoe of pine was met with towards the bottom of the carse clays; and similar finds have frequently been recorded from the contemporaneous deposits in the valleys of the Forth and the Clyde."¹

How did early man come to invent the dug-out? Not only did he hollow out a tree trunk by the laborious process of burning and by chipping with a flint adze, he dressed the trunk so that his boat could be balanced on the water. The early shipbuilders had to learn, and

¹ *Antiquity of Man in Europe*, p. 274, Edinburgh, 1914. The term "Neolithic" is here rather vague. It applies to the Azilians and Maglemosians as well as to later peoples.

did learn, for themselves, "the values of length and beam, of draught and sweet lines, of straight keel; with high stem to breast a wave and high stern to repel a following sea". The fashioning of a sea-worthy, or even a river-worthy boat, must have been in ancient times as difficult a task as was the fashioning of the first aeroplane in our own day. Many problems had to be solved, many experiments had to be made, and, no doubt, many tragedies took place before the first safe model-boat was paddled across a river. The early experimenters may have had shapes of vessels suggested to them by fish and birds, and especially by the aquatic birds that paddled past them on the river breast with dignity and ease. But is it probable that the first experiments were made with trees? Did early man undertake the laborious task of hewing down tree after tree to shape new models, until in the end he found on launching the correctly shaped vessel that its balance was perfect? Or was the dug-out canoe an imitation of a boat already in existence, just as a modern ship built of steel or concrete is an imitation of the earlier wooden ships? The available evidence regarding this important phase of the shipping problem tends to show that, before the dug-out was invented, boats were constructed of light material. Ancient Egypt was the earliest ship-building country in the world, and all ancient ships were modelled on those that traded on the calm waters of the Nile. Yet Egypt is an almost treeless land. There the earliest boats—broad, light skiffs—were made by binding together long bundles of the reeds of papyrus. Ropes were twisted from papyrus as well as from palm fibre.¹ It would appear that, before dug-outs were made, the problems of boat construction were solved by those who had invented papyri skiffs and skin boats. In the case of the latter the skins were stretched round a frame-

¹ Breasted, *A History of Egypt*, pp. 96-7.

work, sewed together and made watertight with pitch. We still refer to the "seams" and the "skin" of a boat.

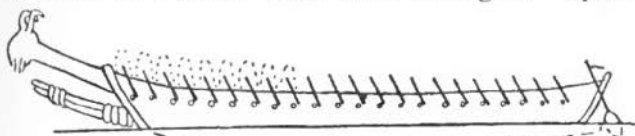
The art of boat-building spread far and wide from the area of origin. Until recently the Chinese were building junks of the same type as they did four or five hundred years earlier. These junks have been compared by more than one writer to the deep-sea boats of the Egyptian Empire period. The Papuans make "dug-outs" and carve eyes on the prows as did the ancient Egyptians and as do the Maltese, Chinese, &c., in our own day. Even when only partly hollowed, the Papuan boats have perfect balance in the water as soon as they are launched.¹ The Polynesians performed religious ceremonies when cutting down trees and constructing boats.² In their incantations, &c., the lore of boat-building was enshrined and handed down. The Polynesian boat was dedicated to the *mo-o* (dragon-god). We still retain a relic of an ancient religious ceremony when a bottle of wine is broken on the bows of a vessel just as it is being launched.

After the Egyptians were able to secure supplies of cedar wood from the Atlas Mountains or Lebanon, by drifting rafts of lashed trees along the coast line, they made dug-out vessels of various shapes, as can be seen in the tomb pictures of the Old Kingdom period. These dug-outs were apparently modelled on the earlier papyri and skin boats. A ship with a square sail spread to the wind is depicted on an Ancient Egyptian two-handed jar in the British Museum, which is of pre-dynastic age and may date to anything like 4000 or 5000 B.C. At that remote period the art of navigation was already well advanced, no doubt on account of the experience gained on the calm waters of the Nile.

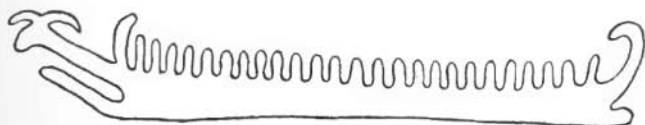
¹ Wollaston, *Pygmies and Papuans (The Stone Age To-day in Dutch New Guinea)*, London, 1912, pp. 53 *et seq.*

² Westervelt, *Legends of Old Honolulu*, pp. 97 *et seq.*

The existence of these boats on the Nile at a time when great race migrations were in progress may well account for the early appearance of dug-outs in Northern Europe. One of the Clyde canoes, found embedded in Clyde silt twenty-five feet above the present sea-level, was found to have a plug of cork which could only have come from the area in which cork trees grow—Spain,



(a)



(b)

(a) Sketch of a boat from Victoria Nyanza, after the drawing in Sir Henry Stanley's *Darkest Africa*. Only the handles of the oars are shown. In outline the positions of some of the oarsmen are roughly represented.

(b) Crude drawing of a similar boat carved upon the rocks in Sweden during the Early Bronze Age, after Montelius. By comparison with (a) it will be seen that the vertical projections were probably intended to represent the oarsmen.

The upturned hook-like appendage at the stern is found in ancient Egyptian and Mediterranean ships, but is absent in the modern African vessel shown in (a).

These figures are taken from Elliot Smith's *Ancient Mariners* (1918).

Southern France, or Italy.¹ It may have been manned by the Azilians of Spain whose rock paintings date from the Transition period. Similar striking evidence of the drift of culture from the Mediterranean area towards Northern Europe is obtained from some of the rock paintings and carvings of Sweden. Among the canoes depicted are some with distinct Mediterranean characteristics. One at Tegneby in Bohuslän bears a striking resemblance to a boat seen by Sir Henry Stanley on

¹ Lyell, *Antiquity of Man*, p. 48.

Lake Victoria Nyanza. It seems undoubted that the designs are of common origin, although separated not only by centuries but by barriers of mountain, desert, and sea extending many hundreds of miles. From the Maglemosian boat the Viking ship was ultimately developed; the unprogressive Victoria Nyanza boat-builders continued through the Ages repeating the design adopted by their remote ancestors. In both vessels the keel projects forward, and the figure-head is that of a goat or ram. The northern vessel has the characteristic inward curving stern of ancient Egyptian ships. As the rock on which it was carved is situated in a metal-yielding area, the probability is that this type of vessel is a relic of the visits paid by searchers for metals in ancient times, who established colonies of dark miners among the fair Northerners and introduced the elements of southern culture.

The ancient boats found in Scotland are of a variety of types. One of those at Glasgow lay, when discovered, nearly vertical, with prow uppermost as if it had foundered; it had been built "of several pieces of oak, though without ribs". Another had the remains of an outrigger attached to it: beside another, which had been partly hollowed by fire, lay two planks that appear to have been wash-boards like those on a Sussex dug-out. A Clyde clinker-built boat, eighteen feet long, had a keel and a base of oak to which ribs had been attached. An interesting find at Kinaven in Aberdeenshire, several miles distant from the Ythan, a famous pearling river, was a dug-out eleven feet long, and about four feet broad. It lay embedded at the head of a small ravine in five feet of peat which appears to have been the bed of an ancient lake. Near it were the stumps of big oaks, apparently of the Upper Forestian period.

Among the longest of the ancient boats that have been discovered are one forty-two feet long, with an animal

head on the prow, from Loch Arthur, near Dumfries, one thirty-five long from near the River Arun in Sussex, one sixty-three feet long excavated near the Rother in Kent, one forty-eight feet six inches long, found at Brigg, Lincolnshire, with wooden patches where she had sprung a leak, and signs of the caulking of cracks and small holes with moss.

These vessels do not all belong to the same period. The date of the Brigg boat is, judging from the geological strata, between 1100 and 700 B.C. It would appear that some of the Clyde vessels found at twenty-five feet above the present sea-level are even older. Beside one Clyde boat was found an axe of polished greenstone similar to the axes used by Polynesians and others in shaping dug-outs. This axe may, however, have been a religious object. To the low bases of some vessels were fixed ribs on which skins were stretched. These boats were eminently suitable for rough seas, being more buoyant than dug-outs. According to Himilco the inhabitants of the *Æstryrnides*, the islands "rich in tin and lead", had most sea-worthy skiffs. "These people do not make pine keels, nor", he says, "do they know how to fashion them; nor do they make fir barks, but, with wonderful skill, fashion skiffs with sewn skins. In these hide-bound vessels, they skim across the ocean." Apparently they were as daring mariners as the Oregon Islanders of whom Washington Irving has written:

"It is surprising to see with what fearless unconcern these savages venture in their light barks upon the roughest and most tempestuous seas. They seem to ride upon the wave like sea-fowl. Should a surge throw the canoe upon its side, and endanger its over turn, those to the windward lean over the upper gunwale, thrust their paddles deep into the wave, and by this action not merely regain an equilibrium, but give their bark a vigorous impulse forward."

The ancient mariners whose rude vessels have been excavated around our coasts were the forerunners of the Celtic sea-traders, who, as the Gaelic evidence shows, had names not only for the North Sea and the English Channel but also for the Mediterranean Sea. They cultivated what is known as the "sea sense", and developed shipbuilding and the art of navigation in accordance with local needs. When Julius Cæsar came into conflict with the Veneti of Brittany he tells that their vessels were greatly superior to those of the Romans. "The bodies of the ships", he says, "were built entirely of oak, stout enough to withstand any shock or violence. . . . Instead of cables for their anchors they used iron chains. . . . The encounter of our fleet with these ships was of such a nature that our fleet excelled in speed alone, and the plying of oars; for neither could our ships injure theirs with their rams, so great was their strength, nor was a weapon easily cast up to them owing to their height. . . . About 220 of their ships . . . sailed forth from the harbour." In this great allied fleet were vessels from our own country.¹

It must not be imagined that the "sea sense" was cultivated because man took pleasure in risking the perils of the deep. It was stern necessity that at the beginning compelled him to venture on long voyages. After England was cut off from France the peoples who had adopted the Neolithic industry must have either found it absolutely necessary to seek refuge in Britain, or were attracted towards it by reports of prospectors who found it to be suitable for residence and trade.

¹ Cæsar's *Gaulic War*, Book III, c. 13-15.

CHAPTER VIII

Neolithic Trade and Industries

Attractions of Ancient Britain—Romans search for Gold, Silver, Pearls, &c.—The Lure of Precious Stones and Metals—Distribution of Ancient British Population—Neolithic Settlements in Flint-yielding Areas—Trade in Flint—Settlements on Lias Formation—Implements from Basic Rocks—Trade in Body-painting Materials—Search for Pearls—Gold in Britain and Ireland—Agriculture—The Story of Barley—Neolithic Settlers in Ireland—Scottish Neolithic Traders—Neolithic Peoples not Wanderers—Trained Neolithic Craftsmen.

The "drift" of peoples into Britain which began in Aurignacian times continued until the Roman period. There were definite reasons for early intrusions as there were for the Roman invasion. "Britain contains to reward the conqueror", Tacitus wrote,¹ "mines of gold and silver and other metals. The sea produces pearls." According to Suetonius, who at the end of the first century of our era wrote the *Lives of the Cæsars*, Julius Cæsar invaded Britain with the desire to enrich himself with the pearls found on different parts of the coast. On his return to Rome he presented a corselet of British pearls to the goddess Venus. He was in need of money to further his political ambitions. He found what he required elsewhere, however. After the death of Queen Cleopatra sufficient gold and silver flowed to Rome from Egypt to reduce the loan rate of interest from 12 to 4 per cent. Spain likewise contributed its share to enrich the great predatory state of Rome.²

Long ages before the Roman period the early peoples

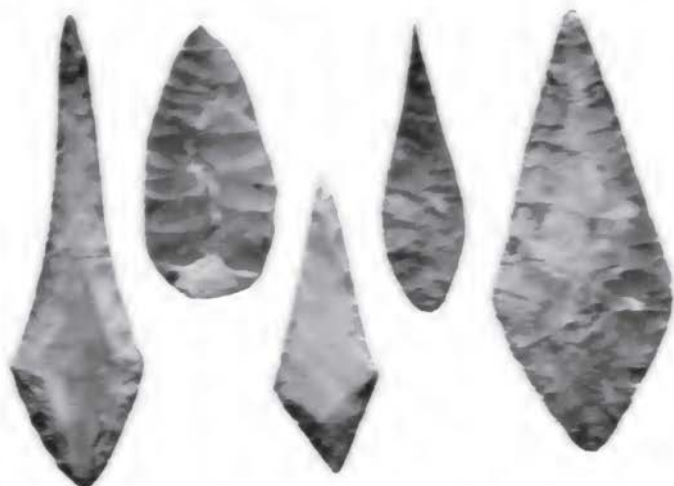
¹ *Agricola*, Chap. XII.

² Smith, *Roman Empire*.

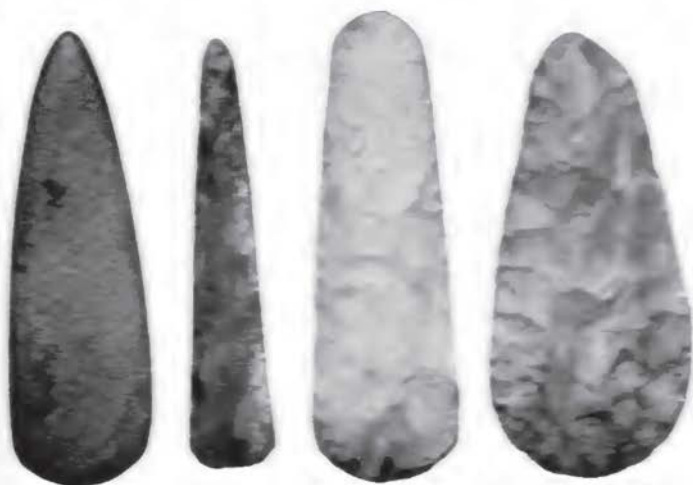
entered Britain in search of pearls, precious stones, and precious metals because these had a religious value. The Celts of Gaul offered great quantities of gold to their deities, depositing the precious metals in their temples and in their sacred lakes. Poseidonius of Apamea tells that after conquering Gaul "the Romans put up these sacred lakes to public sale, and many of the purchasers found quantities of solid silver in them". He also says that gold was similarly placed in these lakes. Apparently the Celts believed, as did the Arzo-Indians, that gold was "a form of the gods" and "fire, light and immortality", and that it was a "life giver". Personal ornaments continued to have a religious value until Christian times.

As we have seen when dealing with the "Red Man of Farnham", the earliest ornaments were shells, teeth of wild animals, coloured stones, ivory, &c. Shells were carried great distances. Then arose the habit of producing substances which were regarded as of great potency as the originals. The ancient Egyptians made use of gold to manufacture imitation shells, and before they worked copper they wore charms of malachite, which is an ore of copper. They probably used copper first for magical purposes just as they used gold. Pearls found in shells were regarded as depositories of supernatural influence, and so were coral and amber [see Chapter XIII]. Like the Arzo-Indians, the Egyptians, Phoenicians, Greeks, and others connected precious metals, stones, pearls, &c. with their deities, and believed that these contained the influence of their deities, and were therefore "lucky". These and similar beliefs are of great antiquity in Europe and Asia and North Africa. It would be rash to assume that they were not

¹ *Journal of the Royal Society of Arts*, 1891, p. 100.
² *Proceedings of the Free School of the East*, XLIV, pp. 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.



FIVE FLINT ARROWHEADS FROM THE SOUTH-EAST



CHIPPED AND POLISHED ARTIFACTS FROM THE SOUTH-EAST
ENGLAND South Museum



known to the ancient mariners who reached our shores in vessels of Mediterranean type.

The colonists who were attracted to Britain at various periods settled in those districts most suitable for their modes of life. It was necessary that they should obtain an adequate supply of the materials from which their implements and weapons were manufactured. The distribution of the population must have been determined by the resources of the various districts.

At the present day the population of Britain is most dense in those areas in which coal and iron are found and where commerce is concentrated. In ancient times, before metals were used, it must have been densest in those areas where flint was found—that is, on the upper chalk formations. If worked flints are discovered in areas which do not have deposits of flint, the only conclusion that can be drawn is that the flint was obtained by means of trade, just as Mediterranean shells were in Aurignacian and Magdalenian times obtained by hunters who settled in Central Europe. In Devon and Cornwall, for instance, large numbers of flint implements have been found, yet in these counties suitable flint was exceedingly scarce in ancient times, except in East Devon, where, however, the surface flint is of inferior character. In Wilts and Dorset, however, the finest quality of flint was found, and it was no doubt from these areas that the early settlers in Cornwall and Devon received their chief supplies of the raw material, if not of the manufactured articles.

In England, as on the Continent, the most abundant finds of the earliest flint implements have been made in those areas where the early hunters and fishermen could obtain their raw materials. River drift implements are discovered in largest numbers on the chalk formations of south-eastern England between the Wash and the estuary of the Thames.

The Neolithic peoples, who made less use of horn and bone than did the Azilians and Maglemosians, had many village settlements on the upper chalk in Dorset and Wiltshire, and especially at Avebury where there were veritable flint factories, and near the famous flint mines at Grimes Graves in the vicinity of Weeting in Norfolk and at Cissbury Camp not far from Worthing in Sussex. Implements were likewise made of basic rocks, including quartzite, ironstone, greenstone, hornblende schist, granite, mica-schist, &c.; while ornaments were made of jet, a hydrocarbon compound allied to cannel coal, which takes on a fine polish, Kimeridge shale and ivory. Withal, like the Aurignacians and Magdalenians, the Neolithic-industry people used body paint, which was made with pigments of ochre, hæmatite, an ore of iron, and ruddle, an earthy variety of iron ore.

In those districts, where the raw materials for stone implements, ornaments, and body paint were found, traces survive of the activities of the Neolithic peoples. Their graves of long-barrow type are found not only in the chalk areas but on the margins of the lias formations. Hæmatite is found in large quantities in West Cumberland and north Lancashire and in south-western England, while the chief source of jet is Whitby in Yorkshire, where it occurs in large quantities in beds of the Upper Lias shale.

Mr. W. J. Perry, of Manchester University, who has devoted special attention to the study of the distribution of megalithic monuments, has been drawing attention to the interesting association of these monuments with geological formations.¹ In the Avebury district stone circles, dolmens, chambered barrows, long barrows, and Neolithic settlements are numerous; another group of megalithic monuments occurs in Oxford on the margin

¹ *Proceedings of the Manchester Literary and Philosophical Society*, 1921.



of the lias formation, and at the south-end of the great iron field extending as far as the Cleveland. According to the memoir of the geological survey, there are traces of ancient surface iron-workings in the Middle Lias formation of Oxfordshire, where red and brown hæmatite were found. Mr. Perry notes that there are megalithic monuments in the vicinity of all these surface workings, as at Fawler, Adderbury, Hook Norton, Woodstock, Steeple Aston, and Hanbury. Apparently the Neolithic peoples were attracted to the lias formation because it contains hæmatite, ochre, shale, &c. There are significant megaliths in the Whitby region where the jet is so plentiful. Amber was obtained from the east coast of England and from the Baltic.

The Neolithic peoples appear to have searched for pearls, which are found in a number of English, Welsh, Scottish, and Irish rivers, and in the vicinity of most, if not all, of these megaliths occur. Gold was the first metal worked by man, and it appears to have attracted some of the early peoples who settled in Britain. The ancient seafarers who found their way northward may have included searchers for gold and silver. The latter metal was at one time found in great abundance in Spain, while gold was at one time fairly plentiful in south-western England, in North Wales, in various parts of Scotland and especially in Lanarkshire, and in north-eastern, eastern, and western Ireland. That there was a "drift" of civilized peoples into Britain and Ireland during the period of the Neolithic industry is made evident by the fact that the agricultural mode of life was introduced. Barley does not grow wild in Europe. The nearest area in which it grew wild and was earliest cultivated was the delta area of Egypt, the region from which the earliest vessels set out to explore the shores of the Mediterranean. It may be that the barley seeds were carried to Britain not by the overland routes alone

to Channel ports, but also by the seafarers whose boats, like the Glasgow one with the cork plug, coasted round by Spain and Brittany, and crossed the Channel to south-western England and thence went northward to Scotland. As Irish flints and ground axe-heads occur chiefly in Ulster, it may be that the drift of early Neolithic settlers into County Antrim, in which gold was also found, was from south-western Scotland. The Neolithic settlement at Whitepark Bay, five miles from the Giant's Causeway, was embedded at a considerable depth, showing that there has been a sinking of the land in this area since the Neolithic industry was introduced.

Neolithic remains are widely distributed over Scotland, but these have not received the intensive study devoted to similar relics in England. Mr. Ludovic Mann, the Glasgow archæologist, has, however, compiled interesting data regarding one of the local industries that bring out the resource and activities of early man. On the island of Arran is a workable variety of the natural volcanic glass, called pitch-stone, that of other parts of Scotland and of Ireland being "too much cracked into small pieces to be of use". It was used by the Neolithic settlers in Arran for manufacturing arrow-heads, and as it was imported into Bute, Ayrshire, and Wigtownshire, a trade in this material must have existed. "If", writes Mr. Mann, "the stone was not locally worked up into implements in Bute, it was so manipulated on the mainland, where workshops of the Neolithic period and the immediately succeeding overlap period yielded long fine flakes, testifying to greater expertness in manufacturing there than is shown by the remains in the domestic sites yet awaiting adequate exploration in Arran. The explanation may be that the Wigtownshire flint knappers, accustomed to handle an abundance of flint, were more proficient than in most other places, and that the pitch-stone was brought to them as experts,

because the material required even more skilful handling than flint".¹ In like manner obsidian, as has been noted, was imported into Crete from the island of Melos by seafarers, long before the introduction of metal working.²

It will be seen that the Neolithic peoples were no mere wandering hunters, as some have represented them to have been, but they had their social organization, their industries, and their system of trading by land and sea. They settled not only in those areas where they could procure a regular food supply, but those also in which they obtained the raw materials for implements, weapons, and the colouring material which they used for religious purposes. They made pottery for grave offerings and domestic use, and wooden implements regarding which, however, little is known. Withal, they had their spinners and weavers. The conditions prevailing in Neolithic settlements must have been similar to those of later times. There must have been systems of laws to make trade and peaceful social intercourse possible, and no doubt these had, as elsewhere, a religious basis. Burial customs indicate a uniformity of beliefs over wide areas. The skill displayed in working stone was so great that it cannot now be emulated. Ripple-flaking has long been a lost art. Craftsmen must have undergone a prolonged period of training which was intelligently controlled under settled conditions of life. It is possible that the so-called Neolithic folk were chiefly foreigners who exploited the riches of the country. The evidence in this connection will be found in the next chapter.

¹ *Proceedings of the Society of Antiquaries of Scotland*, 1917-18, pp. 149 *et seq.*

² See my *Myths of Crete and pre-Hellenic Europe* under "Obsidian" in Index.

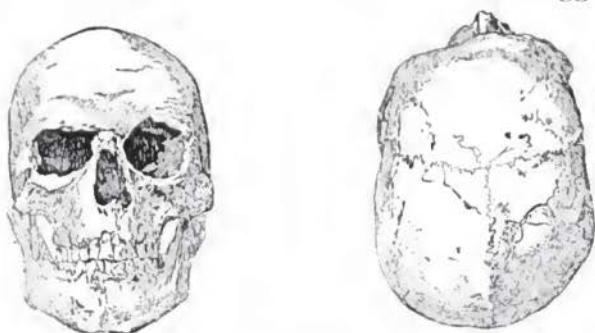
CHAPTER IX

Metal Workers and Megalithic Monuments

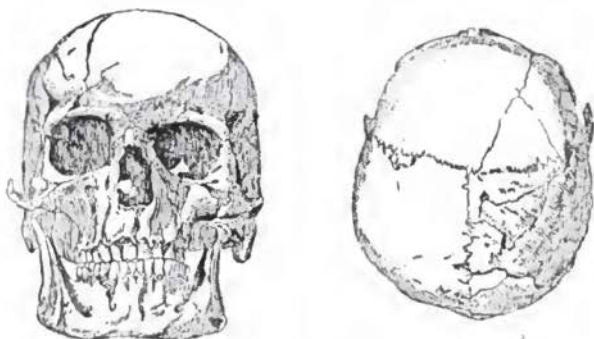
"Broad-heads" of Bronze Age—The Irish Evidence—Bronze Introduced by Traders—How Metals were Traced—A Metal Working Tribe—Damnonii in England, Scotland, and Ireland—Miners as Slaves—The Lot of Women Workers—Megalithic Monuments in English Metal-yielding Areas—Stone Circles in Barren Localities—Early Colonies of Easterners in Spain—Egyptian and Babylonian Relics associated with British Jet and Baltic Amber—A New Flint Industry of Eastern Origin—British Bronze identical with Continental—Ancient Furnaces of Common Origin—"Stones of Worship" adorned with Metals—The "Maggot God" of Stone Circles—Ancient Egyptian Beads at Stonehenge—Earliest Authentic Date in British History—The Aim of Conquests.

It used to be thought that the introduction of metal working into Britain was the result of an invasion of alien peoples, who partly exterminated and partly enslaved the long-headed Neolithic inhabitants. This view was based on the evidence afforded by a new type of grave known as the "Round Barrow". In graves of this class have been found Bronze Age relics, a distinctive kind of pottery, and skulls of broad-heads. The invasion of broad-heads undoubtedly took place, and their burial customs suggest that their religious beliefs were not identical with those of the long-heads. But it remains to be proved that they were the actual introducers of the bronze industry. They do not appear to have reached Ireland, where bronze relics are associated with a long-headed people of comparatively low stature.

The early Irish bronze forms were obviously obtained from Spain, while early English bronze forms resemble those of France and Italy. Cutting implements were the first to be introduced. This fact does not suggest



Long-head (Dolichocephalic) Skull



Broad-head (Brachycephalic) Skull

Both these specimens were found in "Round" Barrows in the East Riding of Yorkshire

that a conquest took place. The implements may have been obtained by traders. Britain apparently had in those ancient times its trading colonies, and was visited by active and enterprising seafarers.

The discovery of metals in Britain and Ireland was,

no doubt, first made by prospectors who had obtained experience in working them elsewhere. They may have simply come to exploit the country. How these men conducted their investigations is indicated by the report found in a British Museum manuscript, dating from about 1603, in which the prospector gives his reason for believing that gold was to be found on Crawford Moor in Lanarkshire. He tells that he saw among the rocks what Scottish miners call "mothers" and English miners "leaders" or "metalline fumes". It was believed that the "fumes" arose from veins of metal and coloured the rocks as smoke passing upward through a tunnel blackens it, and leaves traces on the outside. He professed to be able to distinguish between the colours left by "fumes" of iron, lead, tin, copper, or silver. On Crawford Moor he found "sparr, keel, and brimstone" between rocks, and regarded this discovery as a sure indication that gold was *in situ*. The "mothers" or "leaders" were more pronounced than any he had ever seen in Cornwall, Somersetshire, about Keswick, or "any other mineral parts wheresoever I have travelled".¹ Gold was found in this area of Lanarkshire in considerable quantities, and was no doubt worked in ancient times. Of special interest in this connection is the fact that it was part of the territory occupied by Damnonians,² who appear to have been a metal-working people. Besides occupying the richest metal-yielding area in Scotland, the Damnonians were located in Devon and Cornwall, and in the east-midland and western parts of Ireland, in which gold, copper, and tin-stone were found as in south-western England. The Welsh *Dyfneint* (Devon) is supposed by some to be connected with a form of this tribal name. Another form in a Yarrow inscription is Dumnogeni. In Ireland Inber Domnann is the

¹ R. W. Cochrane Patrick, *Early Records relating to Mining in Scotland*, Edinburgh, 1878, p. xxviii.

² The *Damnonii* or *Dumnonii*.

old name of Malahide Bay north of Dublin. Domnu, the genitive of which is Domnann, was the name of an ancient goddess. In the Irish manuscripts these people are referred to as Fir-domnann,¹ and associated with the Fir-bolg (the men with sacks). A sack-carrying people are represented in Spanish rock paintings that date from the Azilian till early "Bronze Age" times. In an Irish manuscript which praises the fair and tall people, the Fir-bolg and Fir-domnann are included among the black-eyed and black-haired people, the descendants of slaves and churls, and "the promoters of discord among the people".

The reference to "slaves" is of special interest because the lot of the working miners was in ancient days an extremely arduous one. In one of his collected records which describes the method "of the greatest antiquity" Diodorus Siculus (A.D. first century) tells how gold-miners, with lights bound on their foreheads, drove galleries into the rocks, the fragments of which were carried out by frail old men and boys. These were broken small by men in the prime of life. The pounded stone was then ground in handmills by women: three women to a mill and "to each of those who bear this lot, death is better than life". Afterwards the milled quartz was spread out on an inclined table. Men threw water on it, work it through their fingers, and dabbed it with sponges until the lighter matter was removed and the gold was left behind. The precious metal was placed in a clay crucible, which was kept heated for five days and five nights. It may be that the Scandinavian references to the nine maidens who turn the handle of the "world mill" which grinds out metal and soil, and the Celtic references to the nine maidens who are associ-

¹ The Fir-domnann were known as "the men who used to deepen the earth", or "dig pits" Professor J. MacNeil in *Labor Gabula*, p. 119. They were thus called "Diggers" like the modern Australians. The name of the goddess referred to the depths (the Under-world). It is probable she was the personification of the metal-yielding earth.

ated with the Celtic cauldron, survive from beliefs that reflected the habits and methods of the ancient metal workers.

It is difficult now to trace the various areas in which gold was anciently found in our islands. But this is not to be wondered at. In Egypt there were once rich goldfields, especially in the Eastern Desert, where about 100 square miles were so thoroughly worked in ancient times that "only the merest traces of gold remain".¹ Gold, as has been stated, was formerly found in south-western England, North Wales, and, as historical records, archæological data, and place names indicate, in various parts of Scotland and Ireland. During the period of the "Great Thaw" a great deal of alluvial gold must have distributed throughout the country. Silver was found in various parts. In Sutherland it is mixed with gold as it is elsewhere with lead. Copper was worked in a number of districts where the veins cannot in modern times be economically worked, and tin was found in Ireland and Scotland as well as in south-western England, where mining operations do not seem to have been begun, as Principal Sir John Rhys has shown,² until after the supplies of surface tin were exhausted. Of special interest in connection with this problem is the association of megalithic monuments with ancient mine workings. An interesting fact to be borne in mind in connection with these relics of the activities and beliefs of the early peoples is that they represent a distinct culture of complex character. Mr. T. Eric Peet³ shows that the megalithic buildings "occupy a very remarkable position along a vast seaboard which includes the Mediterranean coast of Africa and the Atlantic coast of Europe. In other words, they lie entirely along a

¹ Alford, *A Report on Ancient and Prospective Gold Mining in Egypt*, 1900, and *Mining in Egypt* (by Egyptologist).

² *Celtic Britain*, pp. 44 *et seq.* (4th edition).

³ *Rough Stone Monuments*, London, 1912, pp. 147-8.

natural sea route." He gives forcible reasons for arriving at the conclusion that "it is impossible to consider megalithic building as a mere phase through which many nations passed, and it must therefore have been a system originating with one race, and spreading far and wide, owing either to trade influence or migration". He adds:

"Great movements of races by sea were not by any means unusual in primitive days. In fact, the sea has always been less of an obstacle to early man than the land with its deserts, mountains, and unfordable rivers. There is nothing inherently impossible or even improbable in the suggestion that a great immigration brought the megalithic monuments from Sweden to India or vice versa. History is full of instances of such migrations."

But there must have been a definite reason for these race movements. It cannot be that in all cases they were forced merely by natural causes, such as changes of climate, invasions of the sea, and the drying up of once fertile districts, or by the propelling influences of stronger races in every country from the British Isles to Japan—that is, in all countries in which megalithic monuments of similar type are found. The fact that the megalithic monuments are distributed along "a vast seaboard" suggests that they were the work of people who had acquired a culture of common origin, and were attracted to different countries for the same reason. What that attraction was is indicated by studying the elements of the megalithic culture. In a lecture delivered before the British Association in Manchester in 1915, Mr. W. J. Perry threw much light on the problem by showing that the carriers of the culture practised weaving linen, and in some cases the use of Tyrian purple, pearls, precious stones, metals, and conch-shell trumpets, as well as curious beliefs and superstitions attached to the

latter, while they "adopted certain definite metallurgical methods, as well as mining". Mr. Perry's paper was subsequently published by the Manchester Literary and Philosophical Society. It shows that in Western Europe the megalithic monuments are distributed in those areas in which ancient pre-Roman and pre-Greek mine workings and metal washings have been traced. "The same correspondence", he writes, "seems to hold in the case of England and Wales. In the latter country the counties where megalithic structures abound are precisely those where mineral deposits and ancient mine-workings occur. In England the grouping in Cumberland, Westmorland, Northumberland, Durham, and Derbyshire is precisely that of old mines; in Cornwall the megalithic structures are mainly grouped west of Falmouth, precisely in that district where mining has always been most active."

Pearls, amber, coral, jet, &c., were searched for as well as metals. The megalithic monuments near pearling rivers, in the vicinity of Whitby, the main source of jet, and in Denmark and the Baltic area where amber was found were, in all likelihood, erected by people who had come under the spell of the same ancient culture.

When, therefore, we come to deal with groups of monuments in areas which were unsuitable for agriculture and unable to sustain large populations, a reasonable conclusion to draw is that precious metals, precious stones, or pearls were once found near them. The pearling beds may have been destroyed or greatly reduced in value,¹ or the metals may have been worked out, leaving but slight if any indication that they were ever *in situ*. Reference has been made to the traces left by ancient miners in Egypt where no gold is now

¹ The Scottish pearling beds have suffered great injury in historic times. They are the property of the "Crown", and no one takes any interest in them except the "pearl poachers".

found. In our own day rich goldfields in Australia and North America have been exhausted. It would be unreasonable for us to suppose that the same thing did not happen in our country, even although but slight traces of the precious metal can now be obtained in areas which were thoroughly explored by ancient miners.

When early man reached Scotland in search of suitable districts in which to settle, he was not likely to be attracted by the barren or semi-barren areas in which nature grudged soil for cultivation, where pasture lands were poor and the coasts were lashed by great billows for the greater part of the year, and the tempests of winter and spring were particularly severe. Yet in such places as Carloway, fronting the Atlantic on the west coast of Lewis, and at Stennis in Orkney, across the dangerous Pentland Firth, are found the most imposing stone circles north of Stonehenge and Avebury. Traces of tin have been found in Lewis, and Orkney has yielded traces of lead, including silver-lead, copper and zinc, and has flint in glacial drift. Traces of tin have likewise been found on the mainlands of Ross-shire and Argyllshire, in various islands of the Hebrides and in Stirlingshire. The great Stonehenge circle is like the Callernish and Stennis circles situated in a semi-barren area, but it is an area where surface tin and gold were anciently obtained. One cannot help concluding that the early people, who populated the wastes of ancient Britain and erected megalithic monuments, were attracted by something more tangible than the charms of solitude and wild scenery. They searched for and found the things they required. If they found gold, it must be recognized that there was a psychological motive for the search for this precious metal. They valued gold, or whatever other metal they worked in bleak and isolated places, because they had learned to value it elsewhere.

Who were the people that first searched for, found,

and used metals in Western Europe? Some have assumed that the natives themselves did so "as a matter of course". Such a theory is, however, difficult to maintain. Gold is a useless metal for all practical purposes. It is too soft for implements. Besides, it cannot be found or worked except by those who have acquired a great deal of knowledge and skill. The men who first "washed" it from the soil in Britain must have obtained the necessary knowledge and skill in a country where it was more plentiful and much easier to work, and where—and this point is a most important one—the magical and religious beliefs connected with gold have a very definite history. Copper, tin, and silver were even more difficult to find and work in Britain. The ancient people who reached Britain and first worked metals or collected ores were not the people who were accustomed to use implements of bone, horn, and flint, and had been attracted to its shores merely because fish, fowl, deer, and cows, were numerous. The searchers for metals must have come from centres of Eastern civilization, or from colonies of highly skilled peoples that had been established in Western Europe. They did not necessarily come to settle permanently in Britain, but rather to exploit its natural riches.

This conclusion is no mere hypothesis. Siret,¹ the Belgian archæologist, has discovered in southern Spain and Portugal traces of numerous settlements of Easterners who searched for minerals, &c., long before the introduction of bronze working in Western Europe. They came during the archæological "Stone Age"; they even introduced some of the flint implements classed as Neolithic by the archæologists of a past generation.

These Eastern colonists do not appear to have been an organized people. Siret considers that they were merely groups of people from Asia—probably the Syrian coast

¹ *L'Anthropologie*, 1921, contains a long account of his discoveries.

—who were in contact with Egypt. During the Empire period of Egypt, the Egyptian sphere of influence extended to the borders of Asia Minor. At an earlier period Babylonian influence permeated the Syrian coast and part of Asia Minor. The religious beliefs of seafarers from Syria were likely therefore to bear traces of the Egyptian and Babylonian religious systems. Evidence that this was the case has been forthcoming in Spain.

These Eastern colonists not only operated in Spain and Portugal, but established contact with Northern Europe. They exported what they had searched for and found to their Eastern markets. No doubt, they employed native labour, but they do not appear to have instructed the natives how to make use of the ores they themselves valued so highly. In time they were expelled from Spain and Portugal by the people or mixed peoples who introduced the working of bronze and made use of bronze weapons. These bronze carriers and workers came from Central Europe, where colonies of peoples skilled in the arts of mining and metal working had been established. In the Central European colonies Ægean and Danubian influences have been detected.

Among the archaeological finds, which prove that the Easterners settled in Iberia before bronze working was introduced among the natives, are idol-like objects made of hippopotamus ivory from Egypt, a shell (*Dentalium elephantum*) from the Red Sea, objects made from ostrich eggs which must have been carried to Spain from Africa, alabaster perfume flasks, cups of marble and alabaster of Egyptian character which had been shaped with copper implements, Oriental painted vases with decorations in red, black, blue, and green,¹ mural paintings on layers of plaster, feminine statuettes in alabaster which Siret considers to be of Babylonian type,

¹ The colours blue and green were obtained from copper.



Valentine

THE RING OF STENNIS, ORKNEY (see page 94)



for they differ from Ægean and Egyptian statuettes, a cult object (found in graves) resembling the Egyptian *ded* amulet, &c. The Iberian burial places of these Eastern colonists have arched cupolas and entrance corridors of Egyptian-Mycenæan character.

Of special interest are the beautifully worked flints associated with these Eastern remains in Spain and Portugal. Siret draws attention to the fact that no trace has been found of "flint factories". This particular flint industry was an entirely new one. It was not a development of earlier flint-working in Iberia. Apparently the new industry, which suddenly appears in full perfection, was introduced by the Eastern colonists. It afterwards spread over the whole maritime west, including Scandinavia where the metal implements of more advanced countries were imitated in flint. This important fact emphasizes the need for caution in making use of such a term as "Neolithic Age". Siret's view in this connection is that the Easterners, who established trading colonies in Spain and elsewhere, prevented the local use of metals which they had come to search for and export. It was part of their policy to keep the natives in ignorance of the uses to which metals could be put.

Evidence has been forthcoming that the operations of the Eastern colonies in Spain and Portugal were extended towards the maritime north. Associated with the Oriental relics already referred to, Siret has discovered amber from the Baltic, jet from Britain (apparently from Whitby in Yorkshire) and the green-stone called "callais" usually found in beds of tin. The Eastern seafarers must have visited Northern Europe to exploit its virgin riches. A green-stone axe was found, as has been stated, near the boat with the cork plug, which lay embedded in Clyde silt at Glasgow. Artifacts of callais have been discovered in Brittany, in the south of France, in Portugal, and in south-eastern Spain. In the

latter area, as Siret has proved, the Easterners worked silver-bearing lead and copper.

The colonists appear to have likewise searched for and found gold. A diadem of gold was discovered in a necropolis in the south of Spain, where some eminent ancient had been interred. This find is, however, an exception. Precious metals do not as a rule appear in the graves of the period under consideration.

As has been suggested, the Easterners who exploited the wealth of ancient Iberia kept the natives in ignorance. "This ignorance", Siret says, "was the guarantee of the prosperity of the commerce carried on by the strangers. . . . The first action of the East on the West was the exploitation for its exclusive and personal profit of the virgin riches of the latter." These early Westerners had no idea of the use and value of the metals lying on the surface of their native land, while the Orientals valued them, were in need of them, and were anxious to obtain them. As Siret puts it:

"The West was a cow to be milked, a sheep to be fleeced, a field to be cultivated, a mine to be exploited."

In the traditions preserved by classical writers, there are references to the skill and cunning of the Phœnicians in commerce, and in the exploitation of colonies founded among the ignorant Iberians. They did not inform rival traders where they found metals. "Formerly", as Strabo says, "the Phœnicians monopolized the trade from Gades (Cadiz) with the islanders (of the Cassiterides); and they kept the route a close secret." A vague ancient tradition is preserved by Pliny, who tells that "tin was first fetched from Cassiteris (the tin island) by Midacritus".¹ We owe it to the secretive Phœnicians that the problem of the Cassiterides still remains a difficult one to solve.

¹ *Nat. Hist.*, VII. 56 (57), § 197.

To keep the native people ignorant the Easterners, Siret believes, forbade the use of metals in their own colonies. A direct result of this policy was the great development which took place in the manufacture of the beautiful flint implements already referred to. These the natives imitated, never dreaming that they were imitating some forms that had been developed by a people who used copper in their own country. When, therefore, we pick up beautiful Neolithic flints, we cannot be too sure that the skill displayed belongs entirely to the "Stone Age", or that the flints "evolved" from earlier native forms in those areas in which they are found.

The Easterners do not appear to have extracted the metals from their ores either in Iberia or in Northern Europe. Tin-stone and silver-bearing lead were used for ballast for their ships, and they made anchors of lead. Gold washed from river beds could be easily packed in small bulk. A people who lived by hunting and fishing were not likely to be greatly interested in the laborious process of gold-washing. Nor were they likely to attach to gold a magical and religious value as did the ancient Egyptians and Sumerians.

So far as can be gathered from the Iberian evidence, the period of exploitation by the colonists from the East was a somewhat prolonged one. How many centuries it covered we can only guess. It is of interest to find, in this connection, however, that something was known in Mesopotamia before 2000 B.C. regarding the natural riches of Western Europe. Tablets have recently been found on the site of Asshur, the ancient capital of Assyria, which was originally a Sumerian settlement. These make reference to the Empire of Sargon of Akkad (c. 2600 B.C.), which, according to tradition, extended from the Persian Gulf to the Syrian coast. Sargon was a great conqueror. "He poured out his glory over the world", declares a tablet found a good many years ago.

It was believed, too, that Sargon embarked on the Mediterranean and occupied Cyprus. The fresh evidence from the site of Asshur is to the effect that he conquered Kaptara (? Crete) and "the Tin Land beyond the Upper Sea" (the Mediterranean). The explanation may be that he obtained control of the markets to which the Easterners carried from Spain and the coasts of Northern Europe the ores, pearls, &c., they had searched for and found. It may be, therefore, that Britain was visited by Easterners even before Sargon's time, and that the Glasgow boat with the plug of cork was manned by dark Orientals who were prospecting the Scottish coast before the last land movement had ceased—that is, some time after 3000 B.C.

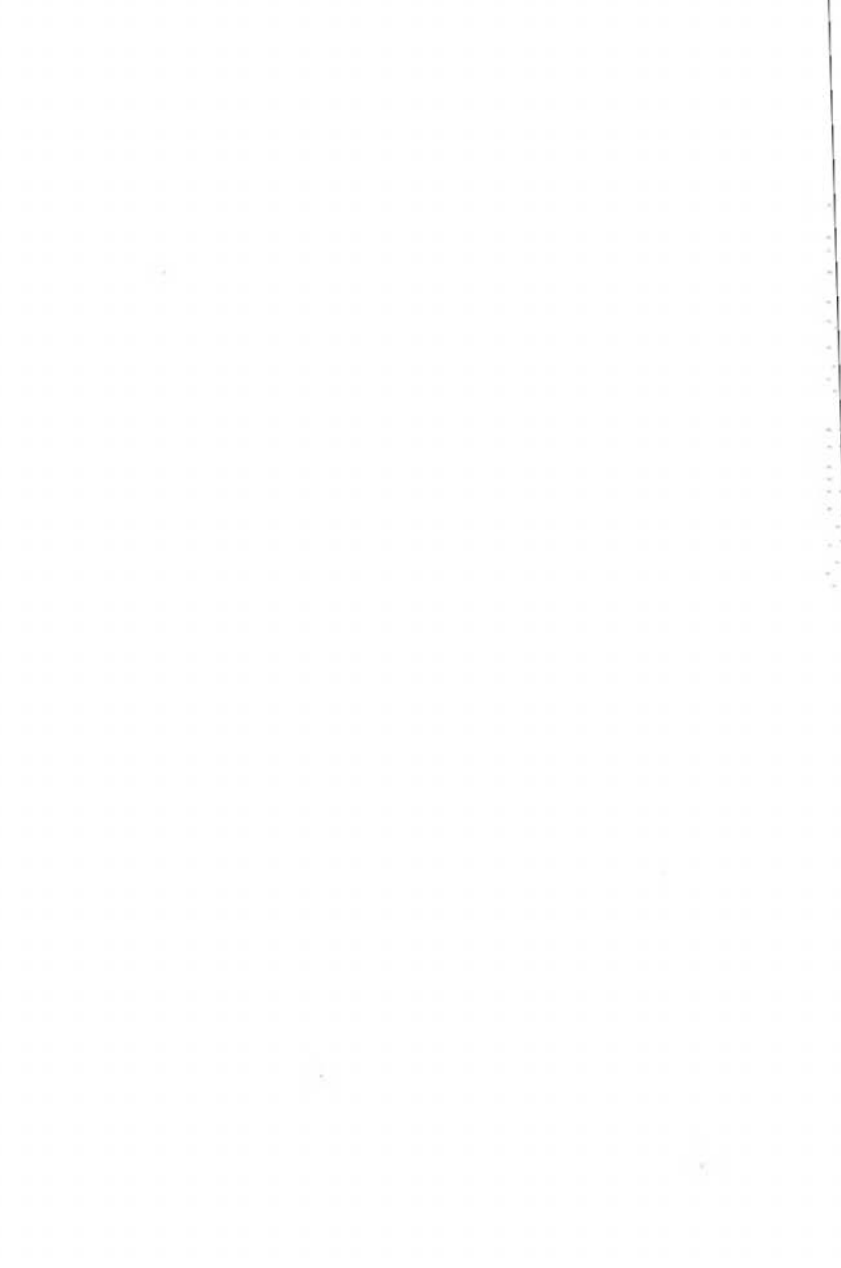
When the Easterners were expelled from Spain by a people from Central Europe who used weapons of bronze, some of them appear to have found refuge in Gaul. Siret is of opinion that others withdrew from Brittany, where subsidences were taking place along the coast, leaving their megalithic monuments below high-water mark, and even under several feet of water as at Morbraz. He thinks that the settlements of Easterners in Brittany were invaded at one and the same time by the enemy and the ocean. Other refugees from the colonies may have settled in Etruria, and founded the Etruscan civilization. Etruscan menhirs resemble those of the south of France, while the Etruscan crozier or wand, used in the art of augury, resembles the croziers of the megaliths, &c., of France, Spain, and Portugal. There are references in Scottish Gaelic stories to "magic wands" possessed by "wise women", and by the mothers of Cyclopean one-eyed giants. Ammianus Marcellinus, quoting Timagenes,¹ attributes to the

¹ Timagenes (c. 85-5 B.C.), an Alexandrian historian, wrote a history of the Gauls which was made use of by Ammianus Marcellinus (A.D. fourth century), a Greek of Antioch, and the author of a history of the Roman Emperors.



MEGALITHS

Upper: Kit's Coty House, Kent. Lower: Trethievy Stone, Cornwall.



Druids the statement that part of the inhabitants of Gaul were indigenous, but that some had come from the farthest shores and districts across the Rhine, "having been expelled from their own lands by frequent wars and the encroachments of the ocean".

The bronze-using peoples who established overland trade routes in Europe, displacing in some localities the colonies of Easterners and isolating others, must have instructed the natives of Western Europe how to mine and use metals. Bronze appears to have been introduced into Britain by traders. That the ancient Britons did not begin quite spontaneously to work copper and tin and manufacture bronze is quite evident, because the earliest specimens of British bronze which have been found are made of ninety per cent of copper and ten per cent of tin as on the Continent. "Now, since a knowledge of the compound", wrote Dr. Robert Munro, "implies a previous acquaintance with its component elements, it follows that progress in metallurgy had already reached the stage of knowing the best combination of these metals for the manufacture of cutting tools before bronze was practically known in Britain."¹

The furnaces used were not invented in Britain. Professor Gowland has shown that in Europe and Asia the system of working mines and melting metals was identical in ancient times.² Summarizing Professor Gowland's articles in *Archæologia* and the *Journal of the Royal Anthropological Institute*, Mr. W. J. Perry writes in this connection:² "The furnaces employed were similar; the crucibles were of the same material, and generally of the same form; the process of smelting, first on the surface and then in the crucibles was found everywhere, even persisting down to present times in

¹ *Prehistoric Britain*, p. 145.

² *The Relationship between the Geographical Distribution of Megalithic Monuments and Ancient Mines*, pp. 21 et seq.

the absence of any fresh cultural influence. The study of the technique of mining and smelting has served to consolidate the floating mass of facts which we have accumulated, and to add support for the contention that one cultural influence is responsible for the earliest mining and smelting and washing of metals and the getting of precious stones and metals. The cause of the distribution of the megalithic culture was the search for certain forms of material wealth."

That certain of the megalithic monuments were intimately connected with the people who attached a religious value to metals is brought out very forcibly in the references to pagan customs and beliefs in early Christian Gaelic literature. There are statements in the Lives of St. Patrick regarding a pagan god called "*Cenn Cruach*" and "*Crom Cruach*" whose stone statue was "adorned with gold and silver, and surrounded by twelve other statues with bronze ornaments". The "statue" is called "the king idol of Erin", and it is stated that "the twelve idols were made of stone, but he ('*Crom Cruach*') was of gold". To this god of a stone circle were offered up "the firstlings of every issue and the chief scions of every clan". Another idol was called *Crom Dubh* ("Black *Crom*"), and his name "is still connected", O'Curry has written, "with the first Sunday of August in Munster and Connaught". An Ulster idol was called *Crom Chonnaill*, which was either a living animal or a tree, or was "believed to have been such", O'Curry says. De Jubainville translates *Cenn Cruach* as "Bloody Head" and *Crom Cruach* as "Bloody Curb" or "Bloody Crescent". O'Curry, on the other hand, translates *Crom Cruach* as "Bloody Maggot" and *Crom Dubh* as "Black Maggot". In Gaelic legends "maggots" or "worms" are referred to as forms of supernatural beings. The maggot which appeared on the flesh of a slain animal was apparently

regarded as a new form assumed by the indestructible soul, just as in the Egyptian story of Bata the germ of life passes from his bull form in a drop of blood from which two trees spring up, and then in a chip from one of the trees from which the man is restored in his original form.¹ A similar belief, which is widespread, is that bees have their origin as maggots placed in trees. One form of the story was taken over by the early Christians, which tells that Jesus was travelling with Peter and Paul and asked hospitality from an old woman. The woman refused it and struck Paul on the head. When the wound putrified maggots were produced. Jesus took the maggots from the wound and placed them in the hollow of a tree. When next they passed that way, "Jesus directed Paul to look in the tree hollow where, to his surprise, he found bees and honey sprung from his own head".² The custom of placing crape on hives and "telling the bees" when a death takes place, which still survives in the south of England and in the north of Scotland, appears to be connected with the ancient belief that the maggot, bee, and tree were connected with the sacred animal and the sacred stone in which was the spirit of a deity. Sacred trees and sacred stones were intimately connected. Tacitus tells us that the Romans invaded Mona (Anglesea), they destroyed the sacred groves in which the Druids and black-robed priestesses covered the altars with the blood of captives.³ There are a number of dolmens on this island and traces of ancient mine-workings, indicating that it had been occupied by the early seafarers who colonized Britain and Ireland and worked metals. A connection between the tree cult of the Druids and the cult of the builders of megaliths is

¹ A worm crept from the heart of a dead Phoenix, and gave origin to a new Phoenix.—*Herodotus*, II, 73.

² Rendel Harris, *The Ascent of Olympus*, p. 2.

³ *Annals of Tacitus*, Book XIV, Chapter 29-30.

thus suggested by Tacitus, as well as by the Irish evidence regarding the Ulster idol Crom Chonnaill, referred to above (see also Chapter XII).

Who were the people that followed the earliest Easterners and visited our shores to search like them for metals and erect megalithic monuments? It is impossible to answer that question with certainty. There were after the introduction of bronze working, as has been indicated, intrusions of aliens. These included the introducers of the short-barrow method of burial and the later introducers of burial by cremation. It does not follow that all intrusions were those of conquerors. Traders and artisans may have come with their families in large numbers and mingled with the earlier peoples. Some intruders appear to have come by overland routes from southern and central France and from Central Europe and the Danube valley, while others came across the sea from Spain. That a regular over-seas trade-route was in existence is indicated by the references made by classical writers to the Cassiterides (Tin Islands). Strabo tells that the natives "bartered tin and hides with merchants for pottery, salt, and articles of bronze". The Phœnicians, as has been noted, "monopolized the trade from Gades (Cadiz) with the islanders and kept the route a close secret". It was probably along this sea-route that Egyptian blue beads reached Britain. Professor Sayce has identified a number of these in Devizes Museum, and writes:

"They are met with plentifully in the Early Bronze Age tumuli of Wiltshire in association with amber beads and barrel-shaped beads of jet or lignite. Three of them come from Stonehenge itself. Similar beads of ivory have been found in a Bronze Age cist near Warminster: if the material is really ivory it must have been derived from the East. The cylindrical faience beads, it may be added, have been discovered in Dorsetshire as well as in Wiltshire."

Professor Sayce emphasizes that these blue beads "belong to one particular period in Egyptian history, the latter part of the Eighteenth Dynasty and the earlier part of the Nineteenth Dynasty. . . . The period to which they belong may be dated 1450-1250 B.C., and as



Beads from Bronze Age Barrows on Salisbury Plain

The large central bead and the small round ones are of amber; the long plain ones are of jet; and the long segmented or notched beads are of an opaque blue substance (faience).

we must allow some time for their passage across the trade routes to Wiltshire an approximate date for their presence in the British barrows will be 1300 B.C."

Dr. H. R. Hall, of the British Museum, who discovered, at Deir el-Bahari in Egypt, "thousands of blue glaze beads of the exact particular type of those found in Britain", says that they date back till "about 1500 B.C.". He noted the resemblance before Professor

Sayce had written. "It is gratifying", he comments, "that the Professor agrees that the Devizes beads are undoubtedly Egyptian, as an important voice is thereby added to the consensus of opinion on the subject." Similar beads have been found in the "Middle Bronze Age in Crete and in Western Europe". Dr. Hall thinks the Egyptian beads may have reached Britain as early as "about 1400 B.C.". ¹ We have thus provided for us an early date in British history, based on the well authenticated chronology of the Empire period of Ancient Egypt. Easterners, or traders in touch with Easterners, reached our shores carrying Egyptian beads shortly before or early in the fourteenth century B.C. At this time amber was being imported into the south of England from the Baltic, while jet was being carried from Whitby in Yorkshire.

After the introduction of bronze working in Western Europe the natives began to work and use metals. These could not have been Celts, for in the fourteenth century B.C. the Celts had not yet reached Western Europe. ² The earliest searchers for metals who visited Britain must therefore have been the congeners of those who erected the megalithic monuments in the metal-yielding areas of Spain and Portugal and north-western France.

It would appear that the early Easterners exploited the virgin riches of Western Europe for a long period—perhaps for over a thousand years—and that, after their Spanish colonies were broken up by a bronze-using people from Central Europe, the knowledge of how to work metals spread among the natives. Overland trade routes were then opened up. At first these were controlled in Western Europe by the Iberians. In time the Celts

¹ *The Journal of Egyptian Archaeology*, Vol. 1, part 1, pp. 18-19.

² It may be that Celtic chronology will have to be readjusted in the light of recent discoveries.

swept westward and formed with the natives mixed communities of Celtiberians. The Easterners appear to have inaugurated a new era in Western European commerce after the introduction of iron working. They had colonies in the south and west of Europe and on the North African coast, and obtained supplies of metals, &c., by sea. They kept the sea-routes secret. British ores, &c., were carried to Spain and Carthage. After Pytheas visited Britain (see next chapter) the overland trade-route to Marseilles was opened up. Supplies of surface tin having become exhausted, tin-mines were opened in Cornwall. The trade of Britain then came under the control of Celtiberian and Celtic peoples, who had acquired their knowledge of shipbuilding and navigation from the Easterners and the mixed descendants of Eastern and Iberian peoples.

It does not follow that the early and later Easterners were all of one physical type. They, no doubt, brought with them their slaves, including miners and seamen, drawn from various countries where they had been purchased or abducted.

The men who controlled the ancient trade were not necessarily permanent settlers in Western Europe. When the carriers of bronze from Central Europe obtained control of the Iberian colonies, many traders may have fled to other countries, but many colonists, and especially the workers, may have become the slaves of the intruders, as did the Firbolgs of Ireland who were subdued by the Celts. The Damnonians of Britain and Ireland who occupied mineral areas may have been a "wave" of early Celtic or Celtiberian people. Ultimately the Celts came, as did the later Normans, and formed military aristocracies over peoples of mixed descent. The idea that each intrusion involved the extermination of earlier peoples is a theory which does not accord with the evidence of the ancient Gaelic manu-

scripts, of classical writers, of folk tradition, and of existing race types in different areas in Britain and Ireland.

A people who exterminated those they conquered would have robbed themselves of the chief fruits of conquest. In ancient as in later times the aim of conquest was to obtain the services of a subject people and the control of trade.

CHAPTER X

Celts and Iberians as Intruders and Traders

Few Invasions in 1000 Years—Broad-heads—The Cremating People—A New Religion—Celtic People in Britain—The Continental Celts—Were Celts Dark or Fair?—Fair Types in Britain and Ireland—Celts as Pork Traders—The Ancient Tin Trade—Early Explorers—Pytheas and Himilco—The Cassiterides—Tin Mines and Surface Tin—Cornish Tin—Metals in Hebrides and Ireland—Lead in Orkney—Dark People in Hebrides and Orkney—Celtic Art—Homeric Civilization in Britain and Ireland—Why Romans were Conquerors.

The beginnings of the Bronze and Iron Ages in Britain are, according to the chronology favoured by archæologists, separated by about a thousand years. During this long period only two or three invasions appear to have taken place, but it is uncertain, as has been indicated, whether these came as sudden outbursts from the Continent or were simply gradual and peaceful infiltrations of traders and settlers. We really know nothing about the broad-headed people who introduced the round-barrow system of burial, or of the people who cremated their dead. The latter became predominant in south-western England and part of Wales. In the north of England the cremating people were less numerous. If they were conquerors they may have, as has been suggested, represented military aristocracies. It may be, however, on the other hand, that the cremation custom had in some areas more a religious than a racial signifi-

cance. The beliefs associated with cremation of the dead may have spread farther than the people who introduced the new religion. It would appear that the habit of burning the dead was an expression of the beliefs that souls were transported by means of fire to the Other-world paradise. As much is indicated by Greek evidence. Homer's heroes burned their dead, and when the ghost of Patroklos appeared to his friend Achilles in a dream, he said: "Thou sleepest, and hast forgotten me, O Achilles. Not in my life wast thou unmindful of me, but in my death. Bury me with all speed, that I may 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, I pray pitifully of thee, thy hand, for never more again shall I come back from Hades, when ye have given me my due of fire."¹ The Arab traveller Ibn Haukal, who describes a tenth-century cremation ceremony at Kieff, was addressed by a Russ, who said: "As for you Arabs you are mad, for those who are the most dear to you, and whom you honour most, you place in the ground, where they will become a prey to worms, whereas with us they are burned in an instant and go straight to Paradise."²

The cremating people, who swept into Greece and became the over-lords of the earlier settlers, were represented in the western movement of tribes towards Gaul and Britain. It is uncertain where the cremation custom had origin. Apparently it entered Europe from Asia. The Vedic Aryans who invaded Northern India worshipped the fire-god Agni, who was believed to carry souls to Paradise; they cremated their dead and com-

¹ *Iliad*, XXIII, 75 (Lang, Leaf, and Myers' translation, p. 452).

² *The Mythology of the Eddas*, pp. 538-9 (*Transactions of the Royal Society of Literature*, second series, Vol. XI).

bined with it the practice of *suttee*, that is, of burning the widows of the dead. In Gaul, however, as we gather from Julius Cæsar, only those widows suspected of being concerned in the death of their husbands were burned. The Norsemen, however, were acquainted with *suttee*. In one of the Volsung lays Brynhild rides towards the pyre on which Sigurd is being burned, and casts herself into the flames. The Russians strangled and burned widows when great men were cremated.

The cremating people erected megalithic monuments, some of which cover their graves in Britain and elsewhere.

In some districts the intruders of the Bronze Age were the earliest settlers. The evidence of the graves in Buchan, Aberdeenshire, for instance, shows that the broad-heads colonized that area. It may be that, like the later Norsemen, bands of people sought for new homes in countries where the struggle for existence would be less arduous than in their own, which suffered from over population, and did not land at points where resistance was offered to them. Agriculturists would, no doubt, select areas suitable for their mode of life and favour river valleys, while seafarers and fishermen would cling to the coasts. The tendency of fishermen and agriculturists to live apart in separate communities has persisted till our own time. There are fishing villages along the east coast of Scotland the inhabitants of which rarely intermarry with those who draw their means of sustenance from the land.

During the Bronze Age Celtic peoples were filtering into Britain from Gaul. They appear to have come originally from the Danube area as conquerors who imposed their rule on the people they subjected. Like the Achæans who overran Greece they seem to have originally been a vigorous pastoral people who had herds of pigs, were "horse-tamers", used chariots, and

were fierce and impetuous in battle. In time they crossed the Rhine and occupied Gaul. They overcame the Etruscans. In 390 B.C. they sacked Rome. Their invasion of Greece occurred in the third century, but their attempt to reach Delphi was frustrated. Crossing into Asia Minor they secured a footing in the area subsequently known as Galatia, and their descendants there were addressed in an epistle by St. Paul.

Like the Achæans, the Celts appear to have absorbed the culture of the Ægean area and that of the Ægean colony at Hallstatt in Austria. They were withal the "carriers" of the La Tène Iron Age culture to Britain and Ireland. The potter's wheel was introduced by them into Britain during the archaeological early Iron Age. It is possible that the cremating people of the Bronze Age were a Celtic people. But later "waves" of the fighting charioteers did not cremate their dead.

Sharp difference of opinion exists between scholars regarding the Celts. Some identify them with the dark-haired, broad-headed Armenoids, and others with the tall and fair long-headed people of Northern Europe. It is possible that the Celts were not a pure race, but rather a confederacy of peoples who were influenced at different periods by different cultures. That some sections were confederacies or small nations of blended people is made evident by classic references to the Celtiberians, the Celto-Scythians, the Celto-Ligydes, the Celto-Thracians, and the Celtillyrians. On reaching Britain they mingled with the earlier settlers, forming military aristocracies, and dominating large areas. The fair Caledonians of Scotland had a Celtic tribal name, and used chariots in battle like the Continental Celts. Two Caledonian personal names are known—*Calgacus* ("swordsmen") and *Argentocoxus* ("white foot"). In Ireland the predominant tribes before and during the early Roman period were of similar type. Queen Meave



Weapons and Religious Objects (British Museum)

Bronze socketed celts, bronze dagger, sword and spear-heads from Thames; two bronze boars with "sun-disc" ears, which were worn on armour; bronze "sun-disc" from Ireland; "chalk drum" from grave (Yorkshire), with ornamentation showing butterfly and St. Andrew's Cross symbols; warrior with shield, from rock carving (Denmark).

of Connaught was like Queen Boadicea¹ of the Iceni, a fair-haired woman who rode to battle in a chariot.

The Continental trade routes up the Danube and Rhone valleys leading towards Britain were for some centuries under the control of the Celts. It was no doubt to obtain a control over trade that they entered Britain and Ireland. On the Continent they engaged in pork curing, and supplied Rome and indeed the whole of Italy with smoked and salted bacon. Dr. Sullivan tells that among the ancient Irish the general name for bacon was *tini*. Smoke-cured hams and flitches were called *tineiccas*, which "is almost identical in form with the Gallo-Roman word *taniaccae* or *tanacae* used by Varro for hams imported from Transalpine Gaul into Rome and other parts of Italy". Puddings prepared from the blood of pigs—now known as "black puddings"—were, we learn from Varro, likewise exported from Gaul to Italy. The ancient Irish were partial to "black puddings".² It would appear, therefore, that the so-called dreamy Celt was a greasy pork merchant.

According to Strabo the exports from Britain in the early part of the first century consisted of gold, silver, and iron, wheat, cattle, skins, slaves, and dogs; while the imports included ivory ornaments, such as bracelets, amber beads, and glass. Tin was exported from Cornwall to Gaul, and carried overland to Marseilles, but this does not appear to have been the earliest route. As has been indicated, tin appears to have been carried, before the Celts obtained control of British trade, by the sea route to the Carthaginian colonies in Spain.

The Carthaginians had long kept secret the sources of their supplies of tin from the group of islands known

¹ *Boadicea* was her real name.

² Introduction to O'Curry's *Manners and Customs of the Ancient Irish*, Vol. I, pp. cccxix et seq.

as the Cassiterides. About 322 B.C., however, the Greek merchants at Marseilles fitted out an expedition which was placed in charge of Pytheas, a mathematician, for the purpose of exploring the northern area. This scholar wrote an account of his voyage, but only fragments of it quoted by different ancient authors have come down to us. He appears to have coasted round Spain and Brittany, and to have sailed up the English Channel to Kent, to have reached as far north as Orkney and Shetland, and perhaps, as some think, Iceland, to have crossed the North Sea towards the mouth of the Baltic, and explored a part of the coast of Norway. He returned to Britain, which he appears to have partly explored before crossing over to Gaul. In an extract from his diary, quoted by Strabo, he tells that the Britons in certain districts not detailed grew corn, millet, and vegetables. Such of them as had corn and honey made a beverage from these materials. They brought the corn ears into great houses (barns) and threshed them there, for on account of the rain and lack of sunshine out-door threshing floors were of little use to them. Pytheas noted that in Britain the days were longer and the nights brighter than in the Mediterranean area. In the northern parts he visited the nights were so short that the interval between sunset and sunrise was scarcely perceptible. The farthest north headland of Britain was Cape Orcas.¹ Six days sail north of Britain lay Thule, which was situated near the frozen sea. There a day lasted six months and a night for the same space of time.

Another extract refers to hot springs in Britain, and a presiding deity identified with Minerva, in whose temple "the fires never go out, yet never whiten into ashes; when the fire has got dull it turns into round lumps like stones". Apparently coal was in use at a temple situated

¹ *Orcas* is a Celtic word signifying "young boar".

at Bath. Timæus, a contemporary of Pytheas, quoting from the lost diary of the explorer, states that tin was found on an island called Mictis, lying inwards (northward) at a distance of six days' sail from Britain. The natives made voyages to and from the island in their canoes of wickerwork covered with hides. Mictis could not have been Cornwall or an island in the English Channel. Strabo states that Crassus, who succeeded in reaching the Cassiterides, announced that the distance to them was greater than that from the Continent to Britain, and he found that the tin ore lay on the surface. Evidently tin was not mined on the island of Mictis as it was in Cornwall in later times.

An earlier explorer than Pytheas was Himilco, the Carthaginian. He reached Britain about 500 B.C. A Latin metrical rendering of his lost work was made by Rufus Festus Avienus in the fourth century of our era. Reference is made to the islands called the *Æstrymnides* that "raise their heads, lie scattered, and are rich in tin and lead". These islands were visited by Himilco, and were distant "two days voyage from the Sacred Island (Ireland) and near the broad Isle of the Albiones". As Rufus Festus Avienus refers to "the hardy folk of Britain", his Albiones may have been the people of Scotland. The name Albion was originally applied to England and Scotland. In the first century, however, Latin writers never used "Albion" except as a curiosity, and knew England as Britain. According to Himilco, the Tartessi of Spain were wont to trade with the natives of the northern tin islands. Even the Carthaginians "were accustomed to visit these seas". From other sources we learn that the Phœnicians carried tin from the Cassiterides direct to the Spanish port of Corbilo, the exact location of which is uncertain.

It is of special importance to note that the tin-stone was collected on the surface of the islands before mining



ENAMELLED BRONZE SHIELD (from the Thames near Battersea)
(British Museum)

operations were conducted elsewhere. In all probability the laborious work of digging mines was not commenced before the available surface supplies became scanty. According to Sir John Rhys¹ the districts in southern England, where surface tin was first obtained, were "chiefly Dartmoor, with the country round Tavistock and that around St. Austell, including several valleys looking towards the southern coast of Cornwall. In most of the old districts where tin existed, it is supposed to have lain too deep to have been worked in early times." When, however, Poseidonius visited Cornwall in the first century of our era, he found that a beginning had been made in skilful mining operations. It may be that the trade with the Cassiterides was already languishing on account of changed political conditions and the shortage of supplies.

Where then were the Cassiterides? M. Reinach struck at the heart of the problem when he asked, "In what western European island is tin found?" Those writers who have favoured the group of islands off the north-western coast of Spain are confronted by the difficulty that these have failed to yield traces of tin, while those writers who favour Cornwall and the Scilly Islands cannot ignore the precise statements that the "tin islands" were farther distant from the Continent than Britain, and that in the time of Pytheas tin was carried from Mictis, which was six days' sail from Britain. The fact that traces of tin, copper, and lead have been found in the Hebrides is therefore of special interest. Copper, too, has been found in Shetland, and lead and zinc in Orkney. Withal there are Gaelic place-names in which *staoín* (tin) is referred to, in Islay, Jura (where there are traces of old mine-workings), in Iona, and on the mainland of Ross-shire. Traces of tin are said to have been found in Lewis where the great stone circle of Callernish

¹ *Celtic Britain*, p. 44.

in a semi-barren area indicates the presence at one time in its area of a considerable population. The Hebrides may well have been the Æstryrnides of Himilco and the Cassiterides of classical writers. Jura or Iona may have been the Mictis of Pytheas. Tin-stone has been found in Ireland too, near Dublin, in Wicklow, and in Killarney.

The short dark people in the Hebrides and Orkney may well be, like the Silurians of Wales, the descendants of the ancient mine workers. They have been referred to by some as descendants of the crews of wrecked ships of the Spanish Armada, and by others as remnants of the Lost Ten Tribes.

In Irish Gaelic literature, however, there is evidence that the dark people were in ancient times believed to be the descendants of the Fir-bolgs (men with sacks), the Fir-domnann (the men who dug the ground), and the Galioin (Gauls). Campbell in his *West Highland Tales* has in a note referred to the dark Hebrideans. "Behind the fire", he wrote, "sat a girl with one of those strange faces which are occasionally to be seen in the Western Isles, a face which reminded me of the Nineveh sculptures, and of faces seen in San Sebastian. Her hair was black as night, and her clear dark eyes glittered through the peat smoke. Her complexion was dark, and her features so unlike those who sat about her that I asked if she were a native of the island (of Barra), and learned that she was a Highland girl." It may be that the dark Eastern people were those who introduced the Eastern and non-Celtic, non-Teutonic prejudice against pork as food into Scotland. In Ireland the Celtic people apparently obliterated the "taboo" at an early period.

It was during the Archæological Late Bronze and Early Iron Ages that the Celtic artistic patterns reached England. These betray affinities with Ægean motifs, and they were afterwards developed in Ireland and

Scotland. In both countries they were fused with symbols of Egyptian and Anatolian origin.

Like the Celts and the pre-Hellenic people of Greece and Crete, the Britons and the Irish wore breeches. The Roman poet, Martial,¹ satirizes a *life* "as loose as the old breeches of a British pauper". Claudian, the poet, pictures Britannia with her cheeks tattooed and wearing a sea-coloured cloak and a cap of bear-skin. The fact that the Caledonians fought with scanty clothing, as did the Greeks, and as did the Highlanders in historic times, must not be taken as proof that they could not manufacture cloth. According to Rhys, Briton means a "cloth clad"² person. The bronze fibulæ found at Bronze Age sites could not have been used to fasten heavy skins.

When the Romans reached Britain, the natives, like the heroes of Homer, used chariots, and had weapons of bronze and iron. The archæology of the ancient Irish stories is of similar character.

In the Bronze Age the swords were pointed and apparently used chiefly for thrusting. The conquerors who introduced the unpointed iron swords were able to shatter the brittle bronze weapons. These iron swords were in turn superseded by the pointed and well-tempered swords of the Romans. But it was not only their superior weapons, their discipline, and their knowledge of military strategy that brought the Romans success. England was broken up into a number of petty kingdoms. "Our greatest advantage", Tacitus confessed, "in dealing with such powerful people is that they cannot act in concert; it is seldom that even two or three tribes will join in meeting a common danger; and so while each fights for himself they are all conquered together."³

¹ *Ep.* x, 22.

² *Celtic Britain* (4th edition), p. 212.

³ Tacitus, *Agricola*, Chap. XII.

When the Britons, under Agricola, began to adopt Roman civilization they "rose superior", Tacitus says, "by the forces of their natural genius, to the attainments of the Gauls". In time they adopted the Roman dress,¹ which may have been the prototype of the kilt. The Roman language supplanted the Celtic dialects in certain parts of England.

¹ *Agricola*, Chap. XXI.

CHAPTER XI

Races of Britain and Ireland

Colours of Ancient Races and Mythical Ages—Caucasian Race Theory—The Aryan or Indo-European Theory—Races and Languages—Celts and Teutons—Fair and Dark Palæolithic Peoples in Modern Britain—Mediterranean Man—The Armenoid or Alpine Broad-heads—Ancient British Tribes—Cruithne and Picts—The Picts of the "Brochs" as Pirates and Traders—Picts and Fairies—Scottish Types—Racial "Pockets".

The race problem has ever been one of engrossing interest to civilized peoples. In almost every old mythology we meet with theories that were formulated to account for the existence of the different races living in the world, and for the races that were supposed to have existed for a time and became extinct. An outstanding feature of each racial myth is that the people among whom it grew up are invariably represented to be the finest type of humanity.

A widespread habit, and one of great antiquity, was to divide the races, as the world was divided, into four sections, and to distinguish them by their colours. The colours were those of the cardinal points and chiefly Black, White, Red, and Yellow. The same system was adopted in dealing with extinct races. Each of these were coloured according to the Age in which they had existence, and the colours were connected with metals. In Greece and India, for instance, the "Yellow Age" was a "Golden Age", the "White Age" a "Silver

Age", the "Red Age" a "Bronze Age", and the "Black Age" an "Iron Age".

Although the old theories regarding the mythical ages and mythical races have long been discarded, the habit of dividing mankind and their history into four sections, according to colours and the metals chiefly used by them, is not yet extinct. We still speak of the "Black man", the "Yellow man", the "Red man", and the "White man". Archæologists have divided what they call the "pre-history of mankind" into the two "Stone Ages", the "Bronze Age" and the "Iron Age". The belief that certain races have become extinct as the result of conquest by invaders is still traceable in those histories that refer, for instance, to the disappearance of "Stone Age man" or "Bronze Age man", or of the British Celts, or of the Picts of Scotland.

That some races have completely disappeared there can be no shadow of a doubt. As we have seen, Neanderthal man entirely vanished from the face of the globe, and has not left a single descendant among the races of mankind. In our own day the Tasmanians have become extinct. These cases, however, are exceptional. The complete extinction of a race is an unusual thing in the history of mankind. A section may vanish in one particular area and yet persist in another. As a rule, in those districts where races are supposed to have perished, it is found that they have been absorbed by intruders. In some cases the chief change has been one of racial designation and nationality.

Crô-Magnon man, who entered Europe when the Neanderthals were hunting the reindeer and other animals, is still represented in our midst. Dr. Collignon, the French ethnologist, who has found many representatives of this type in the Dordogne valley

where their ancestors lived in the decorated cave-dwellings before their organization was broken up by the Azilian and other intruders, shows that the intrusion of minorities of males rarely leaves a permanent change in a racial type. The alien element tends to disappear. "When", he writes, "a race is well seated in a region, fixed to the soil by agriculture, acclimatized by natural selection and sufficiently dense, it opposes, for the most precise observations confirm it, an enormous resistance to newcomers, whoever they may be." Intruders of the male sex only may be bred out in time.

Our interest here is with the races of Britain and Ireland, but, as our native islands were peopled from the Continent, we cannot ignore the evidence afforded by Western and Northern Europe when dealing with our own particular phase of the racial problem.

It is necessary in the first place to get rid of certain old theories that were based on imperfect knowledge or wrong foundations. One theory applies the term "Caucasian Man" to either a considerable section or the majority of European peoples. "The utter absurdity of the misnomer Caucasian, as applied to the blue-eyed and fair-haired Aryan (?) race of Western Europe, is revealed", says Ripley,¹ "by two indisputable facts. In the first place, this ideal blond type does not occur within many hundred miles of Caucasus; and, secondly, nowhere along the great Caucasian chain is there a single native tribe making use of a purely inflectional or Aryan language."

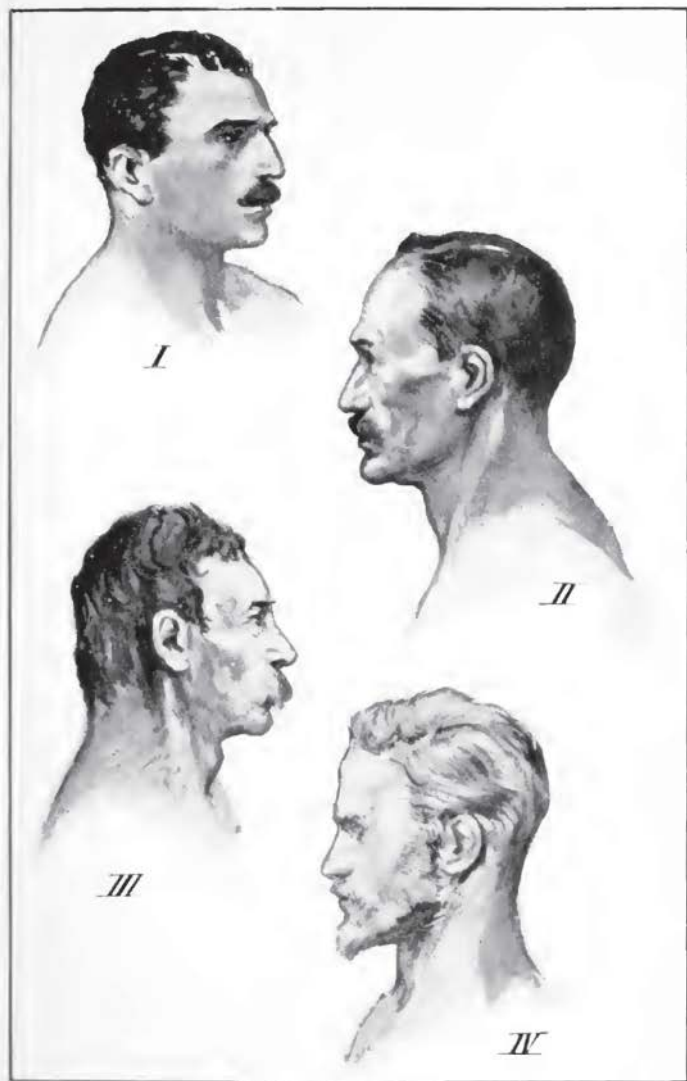
The term "Aryan" is similarly a misleading one. It was invented by Professor Max Müller and applied by him chiefly to a group of languages at a time when races were being identified by the languages they spoke. These peoples—with as different physical

¹ *Races of Europe*, p. 436.

characteristics as have Indians and Norseman, or Russians and Spaniards, who spoke Indo-European, or, as German scholars have patriotically adapted the term, Indo-Germanic languages—were regarded by ethnologists of the "philological school" as members of the one Indo-European or Aryan race or "family". Language, however, is no sure indication of race. The spread of a language over wide areas may be accounted for by trade or political influence or cultural contact. In our own day the English language is spoken by "Black", "Yellow", and "Red", as well as by "White" peoples.

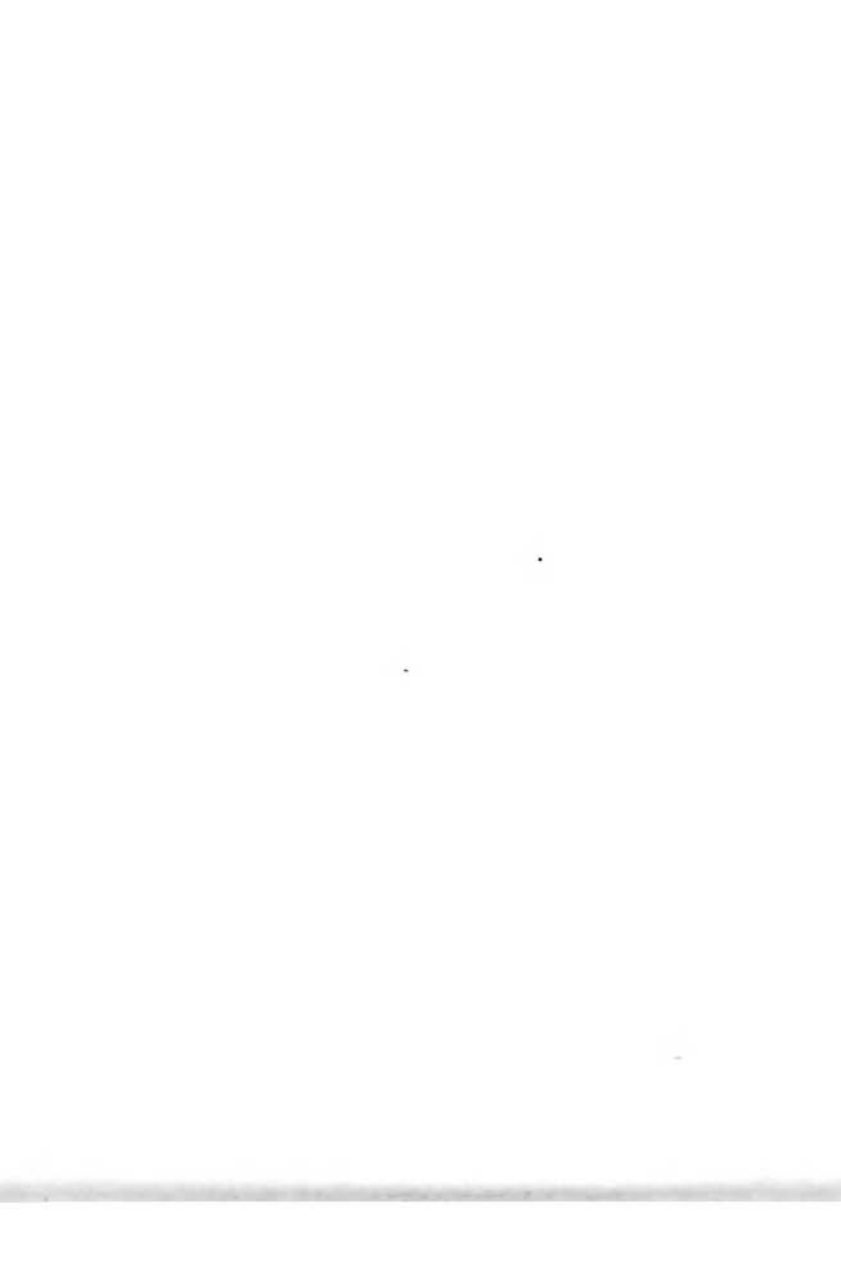
A safer system is to distinguish racial types by their physical peculiarities. When, however, this system is applied in Europe, as elsewhere, we shall still find differences between peoples. Habits of thought and habits of life exercise a stronger influence over individuals, and groups of individuals, than do, for instance, the shape of their heads, the colours of their hair, eyes, and skin, or the length and strength of their limbs. Two particular individuals may be typical representatives of a distinct race and yet not only speak different languages, but have a different outlook on life, and different ideas as to what is right and what is wrong. Different types of people are in different parts of the world united by their sense of nationality. They are united by language, traditions, and beliefs, and by their love of a particular locality in which they reside or in which their ancestors were wont to reside. A sense of nationality, such as unites the British Empire, may extend to far-distant parts of the world.

But, while conscious of the uniting sense of nationality, our people are at the same time conscious of and interested in their physical differences and the histories of different sections of our countrymen. The problem as



EUROPEAN TYPES

I, Mediterranean. II, Crô-Magnon. III, Armenoid (Alpine).
IV, Northern.



to whether we are mainly Celtic or mainly Teutonic is one of perennial interest.

Here again, when dealing with the past, we meet with the same condition of things that prevail at the present day. Both the ancient Celts and the people they called Teutons ("strangers") were mixed peoples with different physical peculiarities. The Celts known to the Greeks were a tall, fair-haired people. In Western Europe, as has been indicated, they mingled with the dark Iberians, and a section of the mingled races was known to the Romans as Celtiberians. The Teutons included the tall, fair, long-headed Northerners, and the dark, medium-sized, broad-headed Central Europeans. Both the fair Celts and the fair Teutons appear to have been sections of the northern race known to antiquaries as the "Baltic people", or "Maglemosians", who entered Europe from Siberia and "drifted" along the northern and southern shores of the Baltic Sea—the ancient "White Sea" of the "White people" of the "White North". As we have seen, other types of humanity were "drifting" towards Britain at the same time—that is, before the system of polishing stone implements and weapons inaugurated what has been called the "Neolithic Age".

As modern-day ethnologists have found that the masses of the population in Great Britain and Ireland are of the early types known to archæologists as Palæolithic, Neolithic, and Bronze Age men, the race history of our people may be formulated as follows:

The earliest inhabitants of our islands whose physical characteristics can be traced among the living population were the Crô-Magnon peoples. These were followed by the fair Northerners, the "carriers" of Maglemosian culture, and the dark, medium-sized Iberians, who were the "carriers" of Azilian-Tardenoisian culture. There were thus fair people in England, Scotland, and Ireland

thousands of years before the invasions of Celts, Angles, Saxons, Jutes, Norsemen, or Danes.

For a long period, extending over many centuries, the migration "stream" from the Continent appears to have been continuously flowing. The carriers of Neolithic culture were in the main Iberians of Mediterranean racial type—the descendants of the Azilian-Tardenoisian peoples who used bows and arrows, and broke up the Magdalenian civilization of Crô-Magnon man in western and central Europe. This race appears to have been characterized in north and north-east Africa. "So striking", writes Professor Elliot Smith, "is the family likeness between the early Neolithic peoples of the British Isles and the Mediterranean and the bulk of the population, both ancient and modern, of Egypt and East Africa, that a description of the bones of an Early Briton of that remote epoch might apply in all essential details to an inhabitant of Somaliland."¹

This proto-Egyptian (Iberian) people were of medium stature, had long skulls and short narrow faces, and skeletons of slight and mild build; their complexions were as dark as those of the southern Italians in our own day, and they had dark-brown or black hair with a tendency to curl; the men had scanty facial hair, except for a chin-tuft beard.

These brunets introduced the agricultural mode of life, and, as they settled on the granite in south-western England, appear to have searched for gold there, and imported flint from the settlers on the upper chalk formation.

In time Europe was invaded from Asia Minor by increasing numbers of an Asiatic, broad-headed, long-bearded people of similar type to those who had filtered into Central Europe and reached Belgium and

¹ *The Ancient Egyptians*, p. 58.

Denmark before Neolithic times. This type is known as the "Armenoid race" (the "Alpine race" of some writers). It was quite different from the long-headed and fair Northern type and the short, brunet Mediterranean (proto-Egyptian and Iberian) type. The Armenoid skeletons found in the early graves indicate that the Asiatics were a medium-sized, heavily-built people, capable, as the large bosses on their bones indicate, of considerable muscular development.

During the archæological Bronze Age these Armenoids reached Britain in considerable numbers, and introduced the round-barrow method of burial. They do not appear, however, as has been indicated, to have settled in Ireland.

At a later period Britain was invaded by a people who cremated their dead. As they thus destroyed the evidence that would have afforded us an indication of their racial affinities, their origin is obscure.

While these overland migrations were in progress, considerable numbers of peoples appear to have reached Britain and Ireland by sea from northern and north-western France, Portugal, and Spain. They settled chiefly in the areas where metals and pearls were once found or are still found. "Kitchen middens" and megalithic remains are in Ireland mainly associated with pearl-yielding rivers.

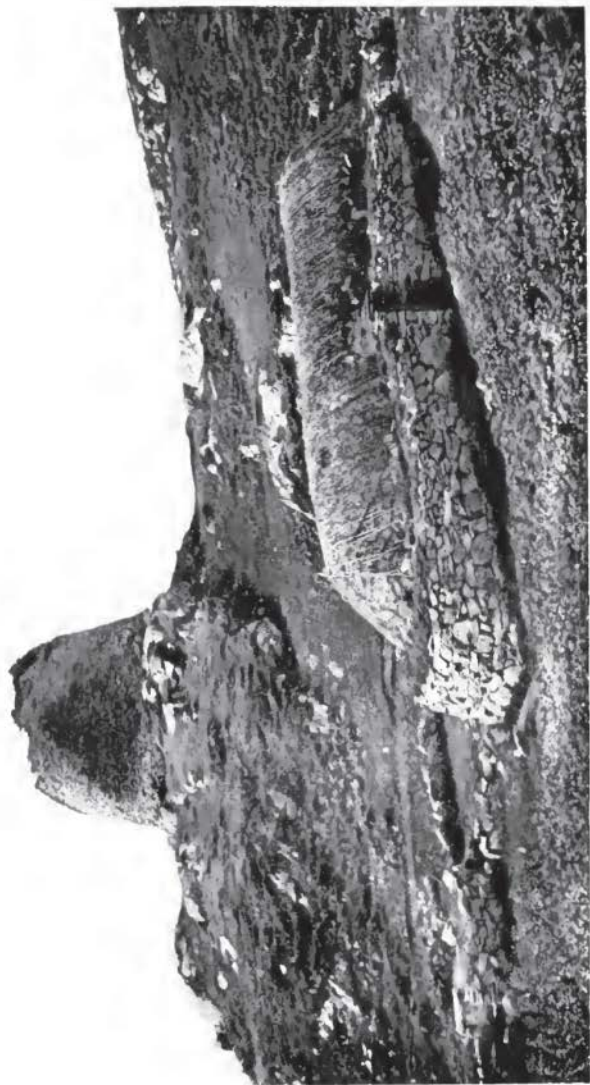
The fair Celts and the darker Celtiberians were invading and settling in Britain before and after the Romans first reached its southern shores. During the Roman period, the ruling caste was mainly of south-European type, but the Roman legions were composed of Gauls, Germans, and Iberians, as well as Italians. No permanent change took place in the ethnics of Britain during the four centuries of Roman occupation. The Armenoid broad-heads, however, became fewer: "the disappearance", as Ripley puts it, "of the round-

barrow men is the last event of the prehistoric period which we are able to distinguish". The inhabitants of the British Isles are, on the whole, long-headed. "Highland and lowland, city or country, peasant or philosopher, all are", says Ripley, "practically alike in respect to this fundamental racial characteristic." Broad-headed types are, of course, to be found, but they are in the minority.

The chief source of our knowledge regarding the early tribes or little nations of Britain and Ireland is the work of Ptolemy, the geographer, who lived between A.D. 50 and 150, from which the earliest maps were compiled in the fourth century. He shows that England, Wales, Scotland, and Ireland were divided among a number of peoples. The Dumnonii,¹ as has been stated, were in possession of Devon and Cornwall, as well as of a large area in the south-western and central lowlands of Scotland. Near them were the Durotriges, who were also in Ireland. Sussex was occupied by the Regni and Kent by the Cantion. The Atrebates, the Belgæ, and the Parisii were invaders from Gaul during the century that followed Cæsar's invasion. The Belgæ lay across the neck of the land between the Bristol Channel and the Isle of Wight; the Atrebates clung to the River Thames, while the Parisii, who gave their name to Paris, occupied the east coast between the Wash and the Humber. Essex was the land of the Icenî or Ecenî, the tribe of Boadicea (Boudicca). Near them were the Catuvellauni (men who rejoiced in battle) who were probably rulers of a league, and the Trinovantes, whose name is said to signify "very vigorous". The most important tribe of the north and midlands of England was the Brigantes,² whose sphere of influence extended to the Firth of Forth,

¹ Englished "Damnonians" (Chapter IX).

² Tacitus says that the Brigantes were in point of numbers the most considerable folk in Britain (*Agricola*, Chapter XVII).



RUINS OF PICTISH TOWER AT CARLOWAY, LEWIS

Modern "black house" in the foreground.



where they met the Votadini, who were probably kinsmen or allies. On the north-west were the Setantii, who appear to have been connected with the Brigantes in England and Ireland. Cuchullin, the hero of the Red Branch of Ulster, was originally named Setanta.¹ In south Wales the chief tribe was the Silures, whose racial name is believed to cling to the Scilly (Silura) Islands. They were evidently like the Dumnonii a metal-working people. South-western Wales was occupied by the Demetæ (the "firm folk"). In south-western Scotland, the Selgovæ ("hunters") occupied Galloway, their nearest neighbours being the Novantæ of Wigtownshire. The Selgovæ may have been those peoples known later as the Atecotti. From Fife to southern Aberdeenshire the predominant people on the east were the Vernicones. In north-east Aberdeenshire were the Tæxali. To the west of these were the Vacomagi. The Caledonians occupied the Central Highlands from Inverness southward to Loch Lomond. In Ross-shire were the Decantæ, a name resembling Novantæ and Setantii. The Lugi and Smertæ (smeared people) were farther north. The Cornavii of Caithness and North Wales were those who occupied the "horns" or "capes". Along the west of Scotland were peoples called the Cerones, Creones, and Carnonacæ, or Carini, perhaps a sheep-rearing people. The Epidii were an Argyll tribe, whose name is connected with that of the horse—perhaps a horse-god.² Orkney enshrines the tribal name of the boar—perhaps that of the ancient boar-god represented on a standing stone near Inverness with the sun symbol above its head. The Gaelic name

¹ Evidently Cuchullin and other heroes of the "Red Branch" in Ireland were descended from peoples who had migrated into Ireland from Britain. Their warriors in the old manuscript tales receive their higher military training in Alba. It is unlikely they would have been trained in a colony.

² Ancient sacred stones with horses depicted on them survive in Scotland. In Harris one horse-stone remains in an old church tower.

of the Shetlanders is "Cat". Caithness is the county of the "Cat" people, too. Professor Watson reminds us that the people of Sutherland are still "Cats" in Gaelic, and that the Duke of Sutherland is referred to as "Duke of the Cats".

The Picts are not mentioned by Ptolemy. They appear to have been an agricultural and sea-faring people who (c. A.D. 300) engaged in trade and piracy. A flood of light has been thrown on the Pictish problem by Professor W. J. Watson, Edinburgh.¹ He shows that when Agricola invaded Scotland (A.D. 85) the predominant people were the Caledonians. Early in the third century the Caledonians and Mæatae—names which included all the tribes north of Hadrian's Wall—were so aggressive that Emperor Septimus Severus organized a great expedition against them. He pressed northward as far as the southern shore of the Moray Firth, and, although he fought no battle, lost 50,000 men in skirmishes, &c. The Caledonians and Mæatae rose again, and Severus was preparing a second expedition when he died at York in A.D. 211. His son, Caracalla, withdrew from Scotland altogether. The Emperor Constantius, who died at York in A.D. 306, had returned from an expedition, not against the Caledonians, but against the Picts. The Picts were beginning to become prominent. In 360 they had again to be driven back. They had then become allies of the Scots from Ulster, who were mentioned in A.D. 297 by the orator Eumenius, as enemies of the Britons in association with the Picti. Professor Watson, drawing on Gaelic evidence, dates the first settlement of the Scots in Argyll "about A.D. 180".

In 368 the Caledonians were, like the Verturiones, a division of the Picts. Afterwards their tribal name dis-

¹ *The Picts*, Inverness, 1921 (lecture delivered to the Gaelic Society of Inverness and reprinted from *The Inverness Courier*).

appeared. That the Picts and Caledonians were originally separate peoples is made clear by the statement of a Roman orator who said: "I do not mention the woods and marshes of the Caledonians, the Picts, and others". In 365 the Pecti, Saxons, Scots, and Atecotti harassed the Britons. Thus by the fourth century the Picts had taken the place of the Caledonians as the leading tribe, or as the military aristocrats of a great part of Scotland, the name of which, formerly Caledonia, came to be Pictland, Pictavia.

Who then were the Picts? Professor Watson shows that the racial name is in old Norse "Pettr", in Old English "Peohta", and in old Scots "Pecht".¹ These forms suggest that the original name was "Pect". Ammianus refers to the "Pecti". In old Welsh "Peithwyr" means "Pict-men" and "Peith" comes from "Pect". The derivation from the Latin "pictus" (painted) must therefore be rejected. It should be borne in mind in this connection that the Ancient Britons stained their bodies with woad. The application of the term "painted" to only one section of them seems improbable. "Pecti", says Professor Watson, "cannot be separated etymologically from Pictones, the name of a Gaulish tribe on the Bay of Biscay south of the Loire, near neighbours of the Veneti. Their name

¹ The fact that in the Scottish Lowlands the fairies were sometimes called "Pechts" has been made much of by those who contend that the prototypes of the fairies were the original inhabitants of Western Europe. This theory ignores the well-established custom of giving human names to supernatural beings. In Scotland the hill-giants (Fomorians) have been re-named after Arthur (as in Arthur's Seat, Edinburgh), Patrick (Inverness), Wallace (Eildon Hills), Samson (Ben Ledi), &c. In like manner fairies were referred to as Pechts. The Irish evidence is of similar character. The Danann deities were consigned to fairyland. Donald Gorm, a West Highland chief, gave his name to an Irish fairy. Fairyland was the old Paradise. Arthur, Thomas the Rhymer, Finn-mac-Coul, &c., became "fairy-men" after death. A good deal of confusion has been caused by mistranslating the Scottish Gaelic word *sìth* (Irish *sidhe*) as "fairy". The word *sìth* (pronounced *shee*) means anything unearthly or supernatural, and the "peace" of supernatural life—of death after life, as well as the silence of the movements of supernatural beings. The cuckoo was supposed to dwell for a part of the year in the underworld, and was called *eun sìth* ("supernatural bird"). Mysterious epidemics were *sìth* diseases. There were *sìth* (supernatural) dogs, cats, mice, cows, &c., as well as *sìth* men and *sìth* women.

shows the same variation between Pictones and Pectones. We may therefore claim Pecti as a genuine Celtic word. It is of the Cymric or Old British and Gaulish type, not of the Gaelic type, for Gaelic has no initial P, while those others have." Gildas (c. A.D. 570), Bede (c. A.D. 730), and Nennius (c. A.D. 800) refer to the Picts as a people from the north of Scotland. Nennius says they occupied Orkney first. The legends which connect the Picts with Scythia and Hercules were based on Virgil's mention of "picti Agathyrsi" and "picti Geloni" (*Æneid* IV, 146, *Georgics*, II, 115) combined with the account by Herodotus (IV, 10) of the descent of Gelonus and Agathyrsus from Hercules. Of late origin therefore was the Irish myth that the Picts from Scythia were called Agathyrsi and were descended from Gelon, son of Hercules.

There never were Picts in Ireland, except as visitors. The theory about the Irish Picts arose by mistranslating the racial name "Cruithne" as "Picts". Communities of Cruithne were anciently settled in the four provinces of Ireland, but Cruithne means Britons not Picts.

The ancient name of Great Britain was Albion, while Ireland was in Greek "Ierne", and in Latin "Iubernia" (later "Hibernia"). The racial name was applied by Pliny to Albion and Hibernia when he referred to the island group as "Britanniae". Ptolemy says that Albion is "a Britannic isle" and further that Albion (England and Scotland) was an island "belonging to the Britannic Isles". Ireland was also a Britannic isle. It is therefore quite clear that the Britons were regarded as the predominant people in England, Wales, Scotland, and Ireland, and that the verdict of history includes Ireland in the British Isles. The Britons were P-Celts, and their racial name "Pretan-Pritan" became in the Gaelic language of the Q-Celts "Cruithen", plural "Cruithne".

In Latin the British Isles are called after their inhabi-



A SCOTTISH "BROCH" (Mousa, Shetland Isles)

Compare with Sardinian *Nuraghe*, page 130.



tants, the rendering being "Britanni", while in Greek it is "Pretannoi" or "Pretanoi". As Professor W. J. Watson and Professor Sir J. Morris Jones, two able and reliable philologists, have insisted, the Greek form is the older and more correct, and the Latin form is merely an adaptation of the Greek form.

In the early centuries of our era the term "Britannus" was shortened in Latin to "Britto" plural "Brittones". This diminutive form, which may be compared with "Scotty" for Scotsman, became popular. In Gaelic it originated the form "Breatain", representing "Brittones" (Britons), which was applied to the Britons of Strathclyde, Wales, and Cornwall, who retained their native speech under Roman rule; in Welsh, the rendering was "Brython". The Welsh name for Scotland became "Prydyn". The northern people of Scotland, having come under the sway of the Picts, were referred to as Picts just as they became "Scots" after the tribe of Scots rose into prominence. In this sense the Scottish Cruithne were Picts. But the Cruithne (Britons) of Ireland were never referred to as Picts. Modern scholars who have mixed up Cruithne and Picts are the inventors of the term "Irish Picts".

The Picts of Scotland have been traditionally associated with the round buildings known as "brochs", which are all built on the same plan. "Of 490 known brochs", says Professor W. J. Watson, "Orkney and Shetland possess 145, Caithness has 150, and Sutherland 67—a total of 362. On the mainland south of Sutherland there are 10 in Ross, 6 Inverness-shire, 2 in Forfar, 1 in Stirling, Midlothian, Selkirk, and Berwick-shires, 3 in Wigtownshire. In the Isles there are 28 in Lewis, 10 in Harris, 30 in Skye, 1 in Raasay, and at least 5 in the isles of Argyll. The inference is that the original seat of the broch builders must have been in the far north, and that their influence proceeded southwards. The masonry

and contents of the brochs prove them to be the work of a most capable people, who lived partly at least by agriculture and had a fairly high standard of civilization. . . . The distribution of the brochs also indicate that their occupants combined agriculture with seafaring. . . . The Wigtown brochs, like the west coast ones generally, are all close to the sea, and in exceedingly strong positions."

These Scottish brochs bear a striking resemblance to the *nuraghi* of the island of Sardinia. Both the broch and the *nuraghe* have low doorways which "would at once put an enemy at a disadvantage in attempting to enter".

Describing the Sardinian structures, Mr. T. Eric Peet writes:¹ "All the *nuraghi* stand in commanding situations overlooking large tracts of country, and the more important a position is from a strategical point of view the stronger will be the *nuraghe* which defends it". Ruins of villages surround these structures. "There cannot be the least doubt", says Peet, "that in time of danger the inhabitants drove their cattle into the fortified enclosure, entered it themselves, and then closed the gates."

In the Balearic Islands are towers called *talayots* which "resemble rather closely", in Peet's opinion, the *nuraghi* of Sardinia. The architecture of the *talayots*, the *nuraghi*, and the brochs resembles that of the bee-hive tombs of Mycenæ (pre-Hellenic Greece). There are no brochs in Ireland. The "round towers" are of Christian origin (between ninth and thirteenth centuries A.D.). A tomb at Labbamologa, County Cork, however, resembles the tombs of the Balearic Isles and Sardinia (Peet, *Rough Stone Monuments*, pp. 43-4).

The Picts appear to have come to Scotland from the country of the ancient Pictones, whose name survives in

¹ *Rough Stone Monuments*, pp. 82 et seq.

Poitiers (Poitiers) and the province of Poitou in France. These Pictones were anciently rivals of the Veneti, the chief sea-traders in Western and Northern Europe during the pre-Roman period. We gather from Cæsar that the Pictones espoused the cause of the Romans when the Veneti and their allies revolted. They and their near neighbours, the Santoni, supplied Cæsar with ships.¹ These were apparently skiffs which were much lighter and smaller than the imposing vessels of the Veneti. As the big vessels of the Armada were no match for the smaller English vessels, so were the Veneti ships no match for the skiffs of the Pictones.

The Picts who settled in Orkney appear to have dominated the eastern and western Scottish sea-routes. It is possible that they traded with Scandinavia and imported Baltic amber. Tacitus states that the Baltic people, who engaged in the amber trade, spoke a dialect similar to that of Britain, worshipped the mother-goddess, and regarded the boar as the symbol of their deity.² Orkney, as has been noted, is derived from the old Celtic word for boar. The boar-people of Orkney who came under the sway of the Picts may have been related to the amber traders.

The Scottish broch-people, associated in tradition with the Picts, were notorious for their piratic habits. In those ancient days, however, piracy was a common occupation. The later Vikings, who seized the naval base of Orkney for the same reason we may conclude as did the Picts, occupied the brochs. Viking means "pirate", as York Powell has shown. In *Egil's Saga* (Chapter XXXII) the hero Bjorn "was sometimes in Viking but sometimes on trading voyages".³

It may be that the term *pictus* was confused with the

¹ *De Bello Gallico*, Book III, Chapter II.

² *Manners of the Germans*, Chapter XLV. The boar was the son of a sow-goddess, Demeter had originally a sow form.

³ *Scandinavian Britain* (London, 1908), pp. 61-3.

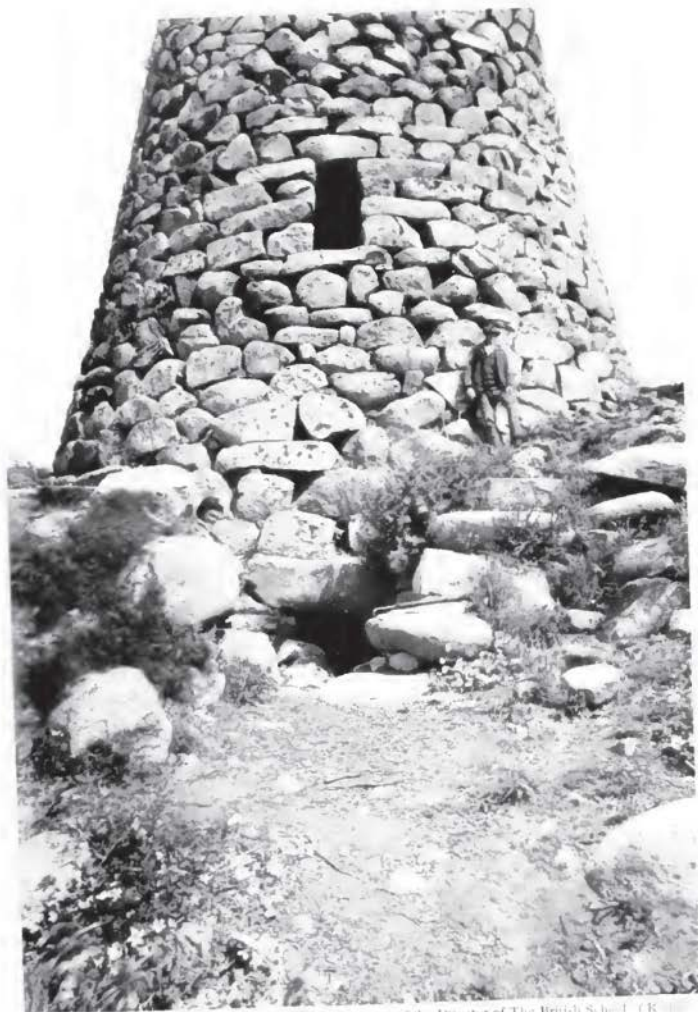
racial name Pecti, because the Picts had adopted the sailor-like habit of tattooing their skins—a habit which probably had a religious significance. Claudian, the fourth-century Roman poet, refers to “the fading steel-wrought figures on the dying Pict”. Like the seafaring Scots of northern Ireland who harried the Welsh coast between the second and fifth centuries of our era, the Picts of Scotland had skiffs (scaphæ) with sails and twenty oars a side. Vessels, masts, ropes, and sails were painted a neutral tint, and the crews were attired in the same colour. Thus “camouflaged”, the Picts and Scots were able to harry the coasts of Romanized Britain. They appear to have turned Hadrian’s wall from the sea. The Pictish seafaring tribes, the Keiths or Cats and the Mæataë, have left their names in Caithness, Inchkeith, Dalkeith, &c., and in the Isle of May, &c.¹

A glimpse of piratical operations in the first century before the Christian era is obtained in an Irish manuscript account of certain happenings in the reign of King Conaire the Great of Ireland. So strict was this monarch’s rule that several lawless and discontented persons were forced into exile.

“Among the most desperate of the outlaws were the monarch’s own foster brothers, the four sons of Dond Dess, an important chieftain of Leinster. These refractory youths, with a large party of followers, took to their boats and ships and scoured the coasts of Britain and Scotland, as well as of their own country. Having met on the sea with Ingcel, the son of the King of Britain, who, for his misdeeds, had been likewise banished by his own father, both parties entered into a league, the first fruits of which were the plunder and devastation of a great part of the British coast.”

They afterwards made a descent on the coast of Ireland, and when King Conaire returned from a visit to

¹ Rhys, *Celtic Britain* (4th ed.), pp. 152, 317.



By courtesy of the Director of The British School, CR 1911

A SARDINIAN *NURAGHE* (page 134)

Compare with the Scottish "Broch", page 132.



Clare, "he found the whole country before him one sheet of fire, the plunderers having landed in his absence and carried fire and sword wherever they went".¹

In his description of Britain, Tacitus says that the inhabitants varied in their physical traits. Different conclusions were drawn concerning their origin. He thought the Caledonians were, because of their ruddy hair and muscular limbs, of German descent, and that the dark Silures of Wales were descendants of Iberian colonists. He noted that the inhabitants of southern England resembled those of Gaul.²

Later writers have expressed divergent views regarding the ethnics of the British Isles. One theory is that the fair Teutonic peoples, who invaded Britain during the post-Roman period, drove the "dark Celts" westward, and that that is the reason why in England and Scotland the inhabitants of western areas are darker than those in the eastern. As we have seen, however, the early metal workers settled in the western areas for the reason that the minerals they sought for were located there. In south-western Scotland the inhabitants are darker than those on the east, except in Aberdeenshire, where there are distinctive megalithic remains and two famous pearling rivers, the Ythan and Ugie, as well as deposits of flint and traces of gold.

The people of Scotland are, on the whole, the tallest and heaviest people in Europe. It has been suggested that their great average stature is due to the settlement in their country of the hardy Norsemen of the Viking period, but this is improbable, because the average stature of Norway, Sweden, and Denmark is lower than that of Scotland. A distinctive feature of the Scottish face is the high cheek-bone. The Norse cheek-bone is distinctly flatter. It may be that the

¹ O'Curry, *Manners and Customs of the Ancient Irish*, Vol. III, p. 136.

² *Agricola*, Chap. XI.

tall Crô-Magnons, who had high cheek-bones, have contributed to Scottish physical traits. That all the fair peoples of Britain and Ireland are, as has been indicated, not necessarily descendants of the fair Celts and Anglo-Saxons is evident from the traces that have been found of the early settlement in these islands of the proto-Scandinavians, who introduced the Maglemosian culture long before the introduction of the Neolithic industry. Modern ethnologists lean to the view that the masses of the present-day population of Europe betray Palæolithic racial affinities. In no country in Europe, other than our own, have there been fewer ethnic changes. As we have seen, there were only two or three intrusions from the Continent between the periods when the bronze and iron industries were introduced—that is, during about a thousand years. The latter invasions were those of types already settled in Britain. As in other countries, the tendency to revert to the early types represented by the masses of the people has not been absent in our native land. The intrusions of energetic minorities may have caused changes of languages and habits of life, but in time the alien element has been absorbed.¹ Withal, the influences of climate and of the diseases associated with localities have ever been at work in eliminating the physically unfit—that is, those individuals who cannot live in a climate too severe for their constitutions. In large industrial cities the short, dark types are more numerous than the tall, fair, and large-lunged types. The latter appear to be more suited for an open-air life.

“Pockets” of peoples of distinctive type are to be found in different parts of the British Isles. In Barvas, Lewis, and elsewhere in the Hebrides, pockets of dark peoples of foreign appearance are reputed by theorists,

¹ “The rule is”, writes Beddoe in this connection (*The Anthropological History of Europe*, p. 53), “that an anthropological type is never wholly dispossessed or extirpated”.

as has been indicated, to be descendants of the sailors of the Spanish Armada. They resemble, however, the Firbolgs of Ireland and the Silures of Wales. Hertfordshire has a dark, short people too. Galloway, the country of the ancient Selgovæ (hunters), is noted for its tall people. It may be that there is a Crô-Magnon strain in Galloway, and that among the short, dark peoples are descendants of the ancient metal workers, including the Easterners who settled in Spain. (See Chaps. IX and XII.) Beddoe thinks that the Phœnician type "occasionally crops up" in Cornwall.¹

¹ *The Anthropological History of Europe* (new edition, Paisley, 1912), p. 50.



CHAPTER XVII

Historical Summary

The evidence dealt with in the foregoing chapters throws considerable light on the history of early man in Britain. We really know more about pre-Roman times than about that obscure period of Anglo-Saxon invasion and settlement which followed on the withdrawal of the Roman army of occupation, yet historians, as a rule, regard it as "pre-historic" and outside their sphere of interest. As there are no inscriptions and no documents to render articulate the archæological Ages of Stone and Bronze, they find it impossible to draw any definite conclusions.

It can be urged, however, in criticism of this attitude, that the relics of the so-called "pre-historic age" may be found to be even more reliable than some contemporary documents of the "historic" period. Not a few of these are obviously biassed and prejudiced, while some are so vague and fragmentary that the conclusions drawn from them cannot be otherwise than hypothetical in character. A plainer, clearer, and more reliable story is revealed by the bones and the artifacts and the surviving relics of the intellectual life of our remote ancestors than by the writings of some early chroniclers and some early historians. It is possible, for instance, in consequence of the scanty evidence available, to hold widely diverging views regarding the Anglo-Saxon and Celtic problems. Pro-Teutonic and pro-Celtic protagonists involve us invariably in bitter controversy. That contemporary

documentary evidence, even when somewhat voluminous, may fail to yield a clear record of facts is evident from the literature that deals, for instance, with the part played by Mary Queen of Scots in the Darnley conspiracy and in the events that led to her execution.

The term "pre-historic" is one that should be discarded. It is possible, as has been shown, to write, although in outline, the history of certain ancient race movements, of the growth and decay of the civilization revealed by the cavern art of Aurignacian and Magdalenian times, of early trade and of early shipping. The history of art goes back for thousands of years before the Classic Age dawned in Greece; the history of trade can be traced to that remote period when Red Sea shells were imported into Italy by Crô-Magnon man; and the history of British shipping can be shown to be as old as those dug-outs that foundered in ancient Scottish river beds before the last land movement had ceased.

The history of man really begins when and where we find the first clear traces of his activities, and as it is possible to write not only regarding the movements of the Crô-Magnon races, but of their beliefs as revealed by burial customs, their use of body paint, the importance attached to shell and other talismans, and their wonderful and high attainments in the arts and crafts, the European historical period can be said to begin in the post-Glacial epoch when tundra conditions prevailed in Central and Western Europe and Italy was connected with the North African coast.

In the case of ancient Egypt, historical data have been gleaned from archæological remains as well as from religious texts and brief records of historical events. The history of Egyptian agriculture has been traced back beyond the dawn of the Dynastic Age and to that inarticulate period before the hieroglyphic system of writing had been invented, by the discovery in the stomachs

of the bodies of proto-Egyptians, naturally preserved in hot dry sands, of husks of barley and of millet native to the land of Egypt.¹

The historical data so industriously accumulated in Egypt and Babylonia have enabled excavators to date certain finds in Crete, and to frame a chronological system for the ancient civilization of that island. Other relics afford proof of cultural contact between Crete and the mainland, as far westward as Spain, where traces of Cretan activities have been discovered. With the aid of comparative evidence, much light is thrown, too, on the history of the ancient Hittites, who have left inscriptions that have not yet been deciphered. The discoveries made by Siret in Spain and Portugal of unmistakable evidence of Egyptian and Babylonian cultural influence, trade, and colonization are, therefore, to be welcomed. The comparative evidence in this connection provides a more reliable basis than has hitherto been available for Western European archaeology. It is possible for the historian to date approximately the beginning of the export trade in jet from England—apparently from Whitby in Yorkshire—and of the export trade in amber from the Baltic, and the opening of the sea routes between Spain and Northern Europe. The further discovery of Egyptian beads in south-western England, in association with relics of the English "Bronze Age", is of far-reaching importance. A "pre-historic" period surely ceases to be "pre-historic" when its relics can be dated even approximately. The English jet found in Spain takes us back till about 2500 B.C., and the Egyptian beads found in England till about 1300 B.C.

The dating of these and other relics raises the question whether historians should accept, without qualification, or at all, the system of "Ages" adopted by archaeolo-

¹ Elliot Smith, *The Ancient Egyptians*, p. 42.

gists. Terms like "Palæolithic" (Old Stone) and "Neolithic" (New Stone) are, in most areas, without precise chronological significance. As applied in the historical sense, they tend to obscure the fact that the former applies to a most prolonged period during which more than one civilization arose, flourished, and decayed. In the so-called "Old Stone Age" flint was worked with a degree of skill never surpassed in the "New Stone Age", as Aurignacian and Solutrean artifacts testify; it was also sometimes badly worked from poorly selected material, as in Magdalenian times, when bone and horn were utilized to such an extent that archaeologists would be justified in referring to a "Bone and Horn Age".

Before the Neolithic industry was introduced into Western Europe and the so-called "Neolithic Age" dawned, as it ended, at various periods in various areas, great climatic changes took place, and the distribution of sea and land changed more than once. Withal, considerable race movements took place in Central and Western Europe. In time new habits of life were introduced into our native land that influenced more profoundly the subsequent history of Britain than could have been possibly accomplished by a new method of working flint. The most important cultural change was effected by the introduction of the agricultural mode of life.

It is important to bear in mind in this connection that the ancient civilizations of Egypt and Babylonia were based on the agricultural mode of life, and that when this mode of life passed into Europe a complex culture was transported with it from the area of origin. It was the early agriculturists who developed shipbuilding and the art of navigation, who first worked metals, and set a religious value on gold and silver, on pearls, and on certain precious stones, and sent out prospectors to search for precious metals and precious gems in distant

lands. The importance of agriculture in the history of civilization cannot be overestimated. In so far as our native land is concerned, a new epoch was inaugurated when the first agriculturist tilled the soil, sowed imported barley seeds, using imported implements, and practising strange ceremonies at sowing, and ultimately at harvest time, that had origin in a far-distant "cradle" of civilization, and still linger in our midst as folk-lore evidence, testifies to the full. In ancient times the ceremonies were regarded as being of as much importance as the implements, and the associated myths were connected with the agriculturists' Calendar, as the Scottish Gaelic Calendar bears testimony.

Instead, therefore, of dividing the early history of man in Britain into periods, named after the materials from which he made implements and weapons, these should be divided so as to throw light on habits of life and habits of thought. The early stages of civilization can be referred to as the "Pre-Agricultural", and those that follow as the "Early Agricultural".

Under "Pre-Agricultural" come the culture stages, or rather the industries known as (1) Aurignacian, (2) Solutrean, and (3) Magdalenian. These do not have the same chronological significance everywhere in Europe, for the Solutrean industry never disturbed or supplemented the Aurignacian in Italy or in Spain south of the Cantabrian Mountains, nor did Aurignacian penetrate into Hungary, where the first stage of Modern Man's activities was the Solutrean. The three stages, however, existed during the post-Glacial period, when man hunted the reindeer and other animals favouring similar climatic conditions. The French archaeologists have named this the "Reindeer Age". Three later industries were introduced into Europe during the Pre-Agricultural Age. These are known as (1) Azilian, (2) Tardenoisian, and (3) Maglemosian. The ice-cap was retreating, the rein-

deer and other tundra animals moved northward, and the red deer arrived in Central and Western Europe. We can, therefore, refer to the latter part of the Pre-Agricultural times as the "Early Red Deer Age".

There is Continental evidence to show that the Neolithic industry was practised prior to the introduction of the agricultural mode of life. The "Early Agricultural Age", therefore, cuts into the archæological "Neolithic Age" in France. Whether or not it does so in Britain is uncertain.

At the dawn of the British "Early Agricultural Age" cultural influences were beginning to "flow" from centres of ancient civilization, if not directly, at any rate indirectly. As has been indicated in the foregoing pages, the Neolithic industry was practised in Britain by a people who had a distinct social organization and engaged in trade. Some Neolithic flints were of Eastern type or origin. The introduction of bronze from the Continent appears to have been effected by sea-faring traders, and there is no evidence that it changed the prevailing habits of thought and life. Our ancestors did not change their skins and their ideas when they began to use and manufacture bronze. A section of them adopted a new industry, but before doing so they had engaged in the search for gold. This is shown by the fact that they settled on the granite in Devon and Cornwall, while yet they were using flints of Neolithic form which had been made elsewhere. Iron working was ultimately introduced. The Bronze and Iron "Ages" of the archæologists can be included in the historian's "Early Agricultural Age", because agriculture continued to be the most important factor in the economic life of Britain. It was the basis of its civilization; it rendered possible the development of mining and of various industries, and the promotion of trade by land and sea. In time the Celtic peoples—that is,

peoples who spoke Celtic dialects—arrived in Britain. The Celtic movement was in progress at 500 B.C., and had not ended after Julius Cæsar invaded southern England. It was finally arrested by the Roman occupation, but continued in Ireland. When it really commenced is uncertain; the earliest Celts may have used bronze only.

The various Ages, according to the system suggested, are as follows:—

1. The Pre-Agricultural Age.

Sub-divisions: (A) the *Reindeer Age* with the Aurignacian, Solutrean, and Magdalenian industries; (B) the *Early Red Deer Age* with the Azilian, Tardenoisian, and Maglemosian industries.

2. The Early Agricultural Age.

Sub-divisions: (A) the *Pre-Celtic Age* with the Neolithic, copper and bronze industries; (B) the *Celtic Age* with the bronze, iron, and enamel industries.

3. The Romano-British Age.

Including in Scotland (A) the *Caledonian Age* and (B) the *Early Scoto-Pictish Age*; and in Ireland the *Cuchullin Age*, during which bronze and iron were used.

The view favoured by some historians that our ancestors were, prior to the Roman invasion, mere “savages” can no longer obtain. It is clearly without justification. Nor are we justified in perpetuating the equally hazardous theory that early British culture was of indigenous origin, and passed through a series of evolutionary stages in isolation until the country offered sufficient attractions to induce first the Celts and afterwards the Romans to conquer it. The correct and historical view appears to be that from the earliest times Britain was subjected to racial and cultural “drifts” from the Continent, and that the latter outnumbered the former.

In the Pre-Agricultural Age Crô-Magnon colonists reached England and Wales while yet in the Aurignacian stage of civilization. As much is indicated by the evidence of the Paviland cave in South Wales. At a later period, proto-Solutrean influence, which had entered Western Europe from North Africa, filtered into England, and can be traced in those caverns that have yielded evidence of occupation. The pure Solutrean culture subsequently swept from Eastern Europe as far westward as Northern Spain, but Britain, like Southern Spain and Italy, remained immune to it. Magdalenian culture then arose and became widespread. It had relations with the earlier Aurignacian and owed nothing to Solutrean. England yields undoubted traces of its influence, which operated vigorously at a time when Scotland was yet largely covered with ice. Certain elements in Aurignacian and Magdalenian cultures appear to have persisted in our midst until comparatively recent times, especially in connection with burial customs and myths regarding the "sleeping heroes" in burial caverns.

The so-called "Transition Period" between the Upper Palæolithic and Neolithic Ages is well represented, especially in Scotland, where the land rose after early man's arrival, and even after the introduction of shipping. As England was sinking when Scotland was rising, English traces of the period are difficult to find. This "Transition Period" was of greater duration than the archaeological "Neolithic Age".

Of special interest is the light thrown by relics of the "Transition Period" on the race problem. Apparently the Crô-Magnons and other peoples of the Magdalenian Age were settled in Britain when the intruders, who had broken up Magdalenian civilization on the Continent, began to arrive. These were (1) the Azilians of Iberian (Mediterranean) type; (2) the Tardenoisians, who came

through Italy from North Africa, and were likewise, it would appear, of Mediterranean racial type; and (3) the Maglemosians, who were mainly a fair, tall people of Northern type. The close proximity of Azilian and Maglemosian stations in western Scotland—at the MacArthur cave (Azilian) and the Drumvaragie shelter (Maglemosian) at Oban, for instance—suggests that in the course of time racial intermixture took place. That all the fair peoples of England, Scotland, and Ireland are descended from Celts or Norwegians is a theory which has not taken into account the presence in these islands at an early period, and before the introduction of the Neolithic industry, of the carriers from the Baltic area of Maglemosian culture.

We next pass to the so-called Neolithic stage of culture,¹ and find it affords fuller and more definite evidence regarding the early history of our native land. As has been shown, there are data which indicate that there was no haphazard distribution of the population of England when the Neolithic industry and the agricultural mode of life were introduced. The theory must be discarded that "Neolithic man" was a wanderer, whose movements depended entirely on those of the wild animals he hunted, as well as the further theory that stone implements and weapons were not used after the introduction of metals. There were, as can be gathered from the evidence afforded by archæological remains, settled village communities, and centres of industry in the Age referred to by archæologists as "Neolithic". The Early Agricultural Age had dawned. Sections of the population engaged in agriculture, sections were miners and workers of flint, sections were hunters and fishermen, sections searched for gold, pigments for body paint, material for ornaments of religious

¹ It must be borne in mind that among the producers and users of Neolithic artifacts were the Easterners who collected and exported ores.

value, &c., and sections engaged in trade, not only with English and Scottish peoples, but with those of the Continent. The English Channel, and probably the North Sea, were crossed by hardy mariners who engaged in trade.

At an early period in the Early Agricultural Age and before bronze working was introduced, England and Wales, Scotland and Ireland, were influenced more directly than had hitherto been the case by the high civilizations of Egypt and Mesopotamia, and especially by their colonies in South-western Europe. The recent Spanish finds indicate that a great "wave" of high Oriental culture was in motion in Spain as far back as 2500 B.C., and perhaps at an even earlier period. Included among Babylonian and Egyptian relics in Spain are, as has been stated, jet from Whitby, Yorkshire, and amber from the Baltic. Apparently the colonists had trading relations with Britain. Whether the "Tin Land", which was occupied by a people owing allegiance to Sargon of Akkad, was ancient Britain is quite uncertain. It was more probably some part of Western Europe. That Western European influence was reaching Britain before the last land movement had ceased is made evident by the fact that the ancient boat with a cork plug, which was found in Clyde silt at Glasgow, lay 25 feet above the present sea-level. The cork plug undoubtedly came from Spain or Italy, and the boat is of Mediterranean type.¹ It is evident that long before the introduction of bronze working the coasts of Britain were being explored by enterprising prospectors, and that the virgin riches of our native land were being exploited. In this connection it is of importance to find that the earliest metal artifacts introduced into our native islands were brought by traders, and that those that reached England were mainly of Gaulish type, while those that

¹ The boat dates the silting process rather than the silting process the boat.

reached Ireland were Spanish. The Neolithic industry does not appear to have been widespread in Ireland, where copper artifacts were in use at a very early period.

A large battle-axe of pure copper, described by Sir David Brewster in 1822 (*Edinburgh Philosophical Journal*, Vol. VI, p. 357), was found at a depth of 20 feet in Ratho Bog, near Edinburgh. Above it were 9 feet of moss, 7 feet of sand, and 4 feet of hard black till-clay. "It must have been deposited along with the blue clay", wrote Brewster, "prior to the formation of the superincumbent stratum of sand, and must have existed before the diluvial operations by which that stratum was formed. This opinion of its antiquity is strongly confirmed by the peculiarity of its shape, and the nature of its composition." The Spanish discoveries have revived interest in this important find.

As has been indicated, jet, pearls, gold, and tin appear to have been searched for and found before bronze working became a British industry. That the early prospectors had experience in locating and working metals before they reached this country there can be little doubt. There was a psychological motive for their adventurous voyages to unknown lands. The distribution of the megalithic monuments and graves indicates that metals were found and worked in south-western England, in Wales, in Derbyshire, and Cumberland, that jet was worked at Whitby, and that metals were located in Ireland and Scotland. Gold must have been widely distributed during the period of the great thaw. It is unlikely that traces of alluvial gold, which had been located and well worked in ancient times, should remain until the present time. In Scotland no traces of gold can now be found in a number of districts where, according to the records, it was worked as late as the fifteenth and sixteenth centuries. Some of the surviving Scottish megalithic monuments may mark the sites of

ancient goldfields that were abandoned in early times when the supplies of precious metal became exhausted. The great circles of Callernish in Lewis and Stennis in Orkney are records of activity in semi-barren areas. Large communities could not have been attracted to these outlying islands to live on the produce of land or sea. Traces of metals, &c., indicate that, in both areas in ancient times, the builders of megalithic monuments settled in remote areas in Britain for the same reason as they settled on parts of the Continent. A gold rod has been discovered in association with the "Druid Temple" at Leys, near Inverness. The Inverness group of circles may well have been those of gold-seekers. In Aberdeenshire a group of megalithic monuments appears to have been erected by searchers for pearls. Gold was found in this county in the time of the Stuart kings.

The close association of megalithic monuments with ancient mine workings makes it impossible to resist the conclusion that the worship of trees and wells was closely connected with the religion of which the megalithic monuments are records. Siret shows that the symbolic markings on typical stone monuments are identical with those of the tree cult. Folk-lore and philological data tend to support this view. From the root *nem* are derived the Celtic names of the pearl, heaven, the grove, and the shrine within the grove (see Chap. XIII). The Celts appear to have embraced the Druidic system of the earlier Iberians in Western Europe, whose culture had been derived from that of the Oriental colonists.

The Oriental mother goddess was connected with the sacred tree, with gold and gems, with pearls, with rivers, lakes, and the sea, with the sky and with the heavenly bodies, long centuries before the Palm-tree cult was introduced into Spain by Oriental colonists. The symbolism of pearls links with that of

jet, the symbolism of jet with that of Baltic amber, and the symbolism of Baltic amber with that of Adriatic amber and of Mediterranean coral. All these sacred things were supposed to contain, like jasper and turquoise in Egypt, the "life substance" of the mother goddess who had her origin in water and her dwelling in a tree, and was connected with the sky and "the waters above the firmament". Coral was supposed to be her sea tree, and jet, amber, silver, and gold were supposed to grow from her fertilizing tears. Beliefs about "grown gold" were quite rife in mediæval Britain.¹

It should not surprise us, therefore, to find traces of Oriental religious conceptions in ancient Britain and Ireland. These have apparently passed from country to country, from people to people, from language to language, and down the Ages without suffering great change. Even when mixed with ideas imported from other areas, they have preserved their original fundamental significance. The Hebridean "maiden-queen" goddess, who dwells in a tree and provides milk from a sea-shell, has a history rooted in a distant area of origin, where the goddess who personified the life-giving shell was connected with the cow and the sky (the Milky Way), as was the goddess Hathor, the Egyptian Aphrodite. The tendency to locate imported religious beliefs no doubt provides the reason why the original palm tree of the goddess was replaced in Britain by the hazel, the elm, the rowan, the apple tree, the oak, &c.

On the Continent there were displacements of peoples after the introduction of bronze, and especially of bronze weapons. There was wealth and there was trade to attract and reward the conqueror. The Eastern traders of Spain were displaced. Some appear to have

¹ The ancient belief is enshrined in Milton's lines referring to "ribs of gold" that "grow in Hell" and are dug out of its hill (*Paradise Lost*, Book I, lines 688 *qq.*).

migrated into Gaul and North Italy; others may have found refuge in Ireland and Britain. The sea-routes were not, however, closed. Ægean culture filtered into Western Europe from Crete, and through the Hallstatt culture centre from the Danubian area. The culture of the tribes who spoke Celtic dialects was veined with Ægean and Asiatic influences. In time Continental Druidism imbibed ideas regarding the Transmigration of Souls and the custom of cremation from an area in the East which had influenced the Aryan invaders of India.

The origin of the Celts is obscure. Greek writers refer to them as a tall, fair people. They were evidently a branch of the fair Northern race, but whether they came from Northern Europe or Northern Asia is uncertain. In Western Europe they intruded themselves as conquerors and formed military aristocracies. Like other vigorous, intruding minorities elsewhere and at different periods, they were in certain localities absorbed by the conquered. In Western Europe they were fused with Iberian communities, and confederacies of Celtiberians came into existence.

Before the great Celtic movements into Western Europe began—that is, before 500 B.C.—Britain was invaded by a broad-headed people, but it is uncertain whether they came as conquerors or as peaceful traders. In time these intruders were absorbed. The evidence afforded by burial customs and surviving traces of ancient religious beliefs and practices tends to show that the culture of the earlier peoples survived over large tracts of our native land. An intellectual conquest of conquerors or intruders was effected by the indigenous population which was rooted to the soil by agriculture and to centres of industry and trade by undisturbed habits of life.

Although the pre-Celtic languages were ultimately

displaced by the Celtic—it is uncertain when this process was completed—the influence of ancient Oriental culture remained. In Scotland the pig-taboo, with its history rooted in ancient Egypt, has had tardy survival until our own times. It has no connection with Celtic culture, for the Continental Celts were a pig-rearing and pork-eating people, like the Ægæan invaders of Greece. The pig-taboo is still as prevalent in Northern Arcadia as in the Scottish Highlands, where the descendants not only of the ancient Iberians but of intruders from pork-loving Ireland and Scandinavia have acquired the ancient prejudice and are now perpetuating it.

Some centuries before the Roman occupation, a system of gold coinage was established in England. Trade with the Continent appears to have greatly increased in volume and complexity. England, Wales, Scotland, and Ireland were divided into small kingdoms. The evidence afforded by the Irish Gaelic manuscripts, which refer to events before and after the Roman conquest of Britain, shows that society was well organized and that the organization was of non-Roman character. Tacitus is responsible for the statement that the Irish manners and customs were similar to those prevailing in Britain, and he makes reference to Irish sea-trade and the fact that Irish sea-ports were well known to merchants. England suffered more from invasions before and after the arrival of Julius Cæsar than did Scotland or Ireland. It was consequently incapable of united action against the Romans, as Tacitus states clearly. The indigenous tribes refused to be allies of the intruders.¹

In Ireland, which Pliny referred to as one of the British Isles, the pre-Celtic Firbolgs were subdued by Celtic invaders. The later "waves" of Celts appeared

¹ *Agricola*, Chap. XII.

to have subdued the earlier conquerors, with the result that "Firbolg" ceased to have a racial significance and was applied to all subject peoples. There were in Ireland, as in England, upper and lower classes, and military tribes that dominated other tribes. Withal, there were confederacies, and petty kings, who owed allegiance to "high kings". The "Red Branch" of Ulster, of which Cuchullin was an outstanding representative, had their warriors trained in Scotland. It may be that they were invaders who had passed through Scotland into Northern Ireland; at any rate, it is unlikely that they would have sent their warriors to a "colony" to acquire skill in the use of weapons. There were Cruithne (Britons) in all the Irish provinces. Most Irish saints were of this stock.

The pre-Roman Britons had ships of superior quality, as is made evident by the fact that a British squadron was included in the great Veneti fleet which Cæsar attacked and defeated with the aid of Pictones and other hereditary rivals of the Veneti and their allies. In early Roman times Britain thus took an active part in European politics in consequence of its important commercial interests.

When the Romans reached Scotland the Caledonians, a people with a Celtic tribal name, were politically predominant. Like the English and Irish pre-Roman peoples, they used chariots and ornamented these with finely worked bronze. Enamel was manufactured or imported. Some of the Roman stories about the savage condition of Scotland may be dismissed as fictions. Who can nowadays credit the statement of Herodian¹ that the warriors of Scotland in Roman times passed their days in the water, or Dion Cassius's² story that they were wont to hide in mud for several days with nothing but their heads showing, and that despite their

¹ *Herodian*, III. 13.

² *Dion Cassius (Xiphilinus)* LXXVI. 12.



BRONZE BUCKLERS OR SHIELDS
(British Museum)

Upper: from the Thames. Lower: from Wales.



fine physique they fed chiefly on herbs, fruit, nuts, and the bark of trees, and, withal, that they had discovered a mysterious earth-nut and had only to eat a piece no larger than a bean to defy hunger and thirst. The further statement that the Scottish "savages" were without state or family organization hardly accords with historical facts. Even Agricola had cause to feel alarm when confronted by the well-organized and well-equipped Caledonian army at the battle of Mons Grampius, and he found it necessary to retreat afterwards, although he claimed to have won a complete victory. His retreat appears to have been as necessary as that of Napoleon from Moscow. The later invasion of the Emperor Severus was a disastrous one for him, entailing the loss of 50,000 men.

A people who used chariots and horses, and artifacts displaying the artistic skill of those found in ancient Britain, had reached a comparatively high state of civilization. Warriors did not manufacture their own chariots, the harness of their horses, their own weapons, armour, and ornaments; these were provided for them by artisans. Such things as they required and could not obtain in their own country had to be imported by traders. The artisans had to be paid in kind, if not in coin, and the traders had to give something in return for what they received. Craftsmen and traders had to be protected by laws, and the laws had to be enforced.

The evidence accumulated by archæologists is sufficient to prove that Britain had inherited from seats of ancient civilization a high degree of culture and technical skill in metal-working, &c., many centuries before Rome was built. The finest enamel work on bronze in the world was produced in England and Ireland, and probably, although definite proof has not yet been forthcoming, in Scotland, the enamels of which

may have been imported and may not. Artisans could not have manufactured enamel without furnaces capable of generating a high degree of heat. The process was a laborious and costly one. It required technical knowledge and skill on the part of the workers. Red, white, yellow, and blue enamels were manufactured. Even the Romans were astonished at the skill displayed in enamel work by the Britons. The people who produced these enamels and the local peoples who purchased them, including the Caledonians, were far removed from a state of savagery.

Many writers, who have accepted without question the statements of certain Roman writers regarding the early Britons and ignored the evidence that archaeological relics provide regarding the arts and crafts and social conditions of pre-Roman times, have in the past written in depreciatory vein regarding the ancestors of the vast majority of the present population of these islands, who suffered so severely at the altar of Roman ambition. Everything Roman has been glorified; Roman victories over British "barbarians" have been included among the "blessings" of civilization. Yet "there is", as Elton says, "something at once mean and tragical about the story of the Roman conquest. . . . On the one side stand the petty tribes, prosperous nations in miniature, already enriched by commerce and rising to a homely culture; on the other the terrible Romans strong in their tyranny and an avarice which could never be appeased."¹

It was in no altruistic spirit that the Romans invaded Gaul and broke up the Celtic organization, or that they invaded Britain and reduced a free people to a state of bondage. The life blood of young Britain was drained by Rome, and, for the loss sustained, Roman institutions, Roman villas and baths, and the Latin language and

¹ *Origins of English History*, pp. 302-3.

literature were far from being compensations. Rome was a predatory state. When its military organization collapsed, its subject states fell with it. Gaul and Britain had been weakened by Roman rule; the ancient spirit of independence had been undermined; native initiative had been ruthlessly stamped out under a system more thorough and severe than modern Prussianism. At the same time, there is, of course, much to admire in Roman civilization.

During the obscure post-Roman period England was occupied by Angles and Saxons and Jutes, who have been credited with the wholesale destruction of masses of the Britons. The dark-haired survivors were supposed to have fled westward, leaving the fair intruders in undisputed occupation of the greater part of England. But the indigenous peoples of the English mining areas were originally a dark-haired and sallow people, and the invading Celts were mainly a fair people. Boadicea was fair-haired like Queen Meave of Ireland. The evidence collected of late years by ethnologists shows that the masses of the English population are descended from the early peoples of the Pre-Agricultural and Early Agricultural Ages. The theory of the wholesale extermination by the Anglo-Saxons of the early Britons has been founded manifestly on very scant and doubtful evidence.

What the Teutonic invasions accomplished in reality was the destruction not of a people but of a civilization. The native arts and crafts declined, and learning was stamped out, when the social organization of post-Roman Britain was shattered. On the Continent a similar state of matters prevailed. Roman civilization suffered decline when the Roman soldier vanished.

Happily, the elements of "Celtic" civilization had been preserved in those areas that had escaped the blight of Roman ambition. The peoples of Celtic

speech had preserved, as ancient Gaelic manuscripts testify, a love of the arts as ardent as that of Rome, and a fine code of chivalry to which the Romans were strangers. The introduction of Christianity had advanced this ancient Celtic civilization on new and higher lines. When the Columban missionaries began their labours outside Scotland and Ireland, they carried Christianity and "a new humanism" over England and the Continent, "and became the teachers of whole nations, the counsellors of kings and emperors". Ireland and Scotland had originally received their Christianity from Romanized England and Gaul. The Celtic Church developed on national lines. Vernacular literature was promoted by the Celtic clerics.

In England, as a result of Teutonic intrusions and conquests, Christianity and Romano-British culture had been suppressed. The Anglo-Saxons were pagans. In time the Celtic missionaries from Scotland and Ireland spread Christianity and Christian culture throughout England.

It is necessary for us to rid our minds of extreme pro-Teutonic prejudices. Nor is it less necessary to avoid the equally dangerous pitfall of the Celtic hypothesis. Christianity and the associated humanistic culture entered these islands during the Roman period. In Ireland and Scotland the new religion was perpetuated by communities that had preserved pre-Roman habits of life and thought which were not necessarily of Celtic origin or embraced by a people who can be accurately referred to as the "Celtic race". The Celts did not exterminate the earlier settlers. Probably the Celts were military aristocrats over wide areas.

Before the fair Celts had intruded themselves in Britain and Ireland, the seeds of pre-Celtic culture, derived by trade and colonization from centres of ancient civilization through their colonies, had been sown and

had borne fruit. The history of British civilization begins with neither Celt nor Roman, but with those early prospectors and traders who entered and settled in the British Isles when mighty Pharaohs were still reigning in Egypt, and these and the enterprising monarchs in Mesopotamia were promoting trade and extending their spheres of influence. The North Syrian or Anatolian carriers of Eastern civilization who founded colonies in Spain before 2500 B.C. were followed by Cretans and Phœnicians. The sea-trade promoted by these pioneers made possible the opening up of overland trade routes. It was after Pytheas had (about 300 B.C.) visited Britain by coasting round Spain and Northern France from Marseilles that the volume of British trade across France increased greatly and the sea-routes became of less importance. When Carthage fell, the Romans had the trade of Western Europe at their mercy, and their conquests of Gaul and Britain were undoubtedly effected for the purpose of enriching themselves at the expense of subject peoples. We owe much to Roman culture, but we owe much also to the culture of the British pre-Roman period.



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PRINTED AND BOUND IN GREAT BRITAIN
By Blackie & Son, Limited, Glasgow

FOOTPRINTS OF EARLY MAN

BY

DONALD A. MACKENZIE

Author of "Ancient Man in Britain"

"Wonder Tales from Scottish Myth and Legend" &c.



THE GRESHAM PUBLISHING COMPANY LTD.
66 CHANDOS STREET, COVENT GARDEN, LONDON

Printed in Great Britain

PREFACE

The story of Early Man is probably the most wonderful ever written. It takes the mind of its reader back for tens of thousands of years, and penetrates the still shadowy realm of pre-history. But, it may be asked, what can we hope to learn, with any certainty, of remote periods which have left neither oral traditions nor written records? To this question the scientist replies that, though no voice of man comes to us from out the primæval wastes, pre-history yet has its authentic records, plain to read. They have been written by earthquake and volcano, by ocean and river, by glacier and by tempest, and by man's own craftsmanship in stone and bone. The materials which bear them are able to defy time itself, as measured by mankind, and among these records is preserved the story of Early Man.

As yet, the story is incomplete, but year by year it continues to reveal itself in larger measure. Nor is it fully read by any one man. Slowly, but surely, the combined efforts of many men whose lines of inquiry appear to have little in common, have pieced together much fragmentary evidence, so that, bit by bit, the story has grown, and increased in interest. To-day it may be read with certainty, even by those who make no claim to be scientists. That it is an unfinished story detracts nothing from its value and its interest. It still

presents problems that thrill the speculative mind and rouse imagination. Few stories, whether fact or fiction, can do as much; none can do more.

In the following pages, then, are set forth the conclusions of many scientists, and the evidence on which their conclusions are based. The anthropologist's work in this connexion is of first importance, but he has been ably supported by the geologist, the anatomist, the chemist, the botanist, and others. As far back as these researches have been able to go, they show man as an intelligent being who had a reason for his actions and made progress when faced by new problems, but tended to be very conservative. Even in the case of the extinct species known to us as Neanderthal Man, whose main preoccupation was the food supply, Early Man was a thinking being. He was also a courageous one, as we know from the evidence of his combats with savage and powerful wild animals. Very early in the history of the race, mankind demonstrated that brain power is of more account than mere brute force.

In this book the subject of Early Man is dealt with in relation to the various geological epochs, from that remote period known as the Tertiary, down to the dawn of the historic period, when, after many changes, the climate of Europe had at last become very much what it is in our own day. Among the most recent discoveries mentioned, are those of the Galilee, the Rhodesian, and the "Lady of Lloyds" and Peking skulls. The remarkable finds of bones of Pleistocene animals and birds in the asphalt beds of California and of mammoths preserved in ice, likewise receive attention, these alone revealing a story of extraordinary interest.

China and the Gobi Desert have very recently supplied im-

portant information on the subject of Early Man. This, along with the work of inquirers working on the American Continent, is included briefly in the text, while reference is made to new views and facts which throw light upon the activities, in Western Europe, of the ancestors of Modern Man.

With the discovery of agriculture and the invention of the first boat, Early Man entered fully into his birthright and began to assert his lordship of the world. The first gave him a settled manner of life which has persisted till our own time and has made possible the thousand-and-one marvels of invention with which Modern Man is so carelessly familiar to-day; the second opened to him the road of high adventure, and his descendants tread it still. How agriculture was discovered and navigation developed from small beginnings are fascinating themes fully discussed in the pages that follow. To the general reader and to the young student, this volume should prove useful as an introduction to more technical literature on the singularly romantic subjects dealt with.

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INTRODUCTORY

It has become customary to divide the story of mankind into two main periods—the *Historic* and the *Pre-Historic*. The term “history” is used to signify a systematic and connected account of a series of events which can be dated, and of which there are written records; while the term “pre-history” refers to the earlier “dumb” period for which there are no such records, the art of writing not having been invented. Of these two periods the pre-historic is by far the longest. Sir Thomas Browne, the famous seventeenth-century Norwich physician and writer, referred to it as “the night of time” which “far surpasseth the day”. Since his time, however, this “night” has become less dark, many wonderful discoveries having been made. It has also grown much longer. Sir Thomas and his contemporaries measured it by centuries, but we now calculate by tens of thousands of years and even have glimpses of millions.

The borderland between the historic and pre-historic periods is nowhere very sharply defined, and it is of very much earlier date in some areas than in others. A gradual and slow dawn is to be seen, for instance, when we are dealing with the beginnings of history in Ancient Egypt and Ancient Mesopotamia. In most of the other areas the change from the pre-historic to the historic period is more sudden, because outside records are available.

In Ancient Egypt alphabetic signs had been invented before the earliest pyramids, near Cairo, were erected. But it is in the later pyramids, which are less imposing, that we find those inscriptions which scholars have learned to read. The oldest inscriptions belong to the Fifth Dynasty of the Kings of united Egypt which began about 2750 B.C. or earlier. There are, however, later native records which enable us to begin the history of Ancient Egypt with the First Dynasty, at about 3000 B.C. or some centuries earlier. In Egypt, therefore, the historic period may be said to have begun about 5000 years ago.

When we come to deal with Great Britain, its written history may be carried back to 55 B.C., when Julius Cæsar invaded it with his Roman army and described his experiences. He found that the natives were organized and had kings of petty states; that they had centres of population, and were accustomed to engage in trade; and that they used horse-chariots in battle, the drivers and warriors being well trained. We may even carry British history back to the fourth century B.C. when Pytheas, the Greek scholar and explorer, a contemporary of Alexander the Great, reached our shores. He sailed from Marseilles round Spain and Brittany, discovered Britain, explored its coasts as far north as Orkney and Shetland, crossed the North Sea to Scandinavia and returned to Britain. His account of his famous voyage has long been lost, but extracts from it have been preserved in the works of later Greek scholars. We gather from these that the Britons of the fourth century B.C. engaged in trade, grew corn which was threshed in barns, and made from barley a drink which was sweetened with honey. For more detailed information we must depend upon the modern pre-historians,

who are discovering and studying the relics of the ancient Britons, including the coins they used in trade—imitations of Greek coins—the other articles they made or imported and the houses they erected, for some traces of even these survive. It will be seen, however, that the historic period in Britain may be said not to have begun until about 3000 years after that of Egypt. When, therefore, we come to deal with the various *Ages* of the pre-historians, or archæologists, it must be borne in mind that they do not everywhere represent the same periods of time. A particular Age may have come to an end in one area long before it began in another.

When we are enabled, by the discoveries not only of the archæologists but also of the geologists and others, to peer back into the remote past, we find that in every part of the world, during the long pre-historic period, there were great geographical changes and great changes of climate. The Mediterranean Sea was formerly divided into two parts, Italy being connected with the north of Africa; a land-bridge joined southern Britain to France, and the Baltic Sea was shut off from the North Sea by another land-bridge. Egypt was then a very different country from what it is now. When the ancestors of the men who built the pyramids entered the valley of the Nile there were forests between it and the Red Sea, and the Sahara Desert was a great green grassland. The climate of North Africa was moister, and rain fell frequently. Much of Europe was, however, desolate and cold, and part of it covered with ice. Animals long since extinct, like the gigantic hairy mammoths of the elephant family, the woolly rhinoceros and the reindeer, roamed about in Central and Western Europe. Groups of human beings lived as hunters and fishermen, and we know that they were the con-

temporaries of certain extinct animals and of others, like the reindeer, found nowadays only in cold northern areas. This we know, because the artists among these peoples made drawings of animals in deep caves. These cave-pictures were made probably about ten thousand years ago. Some would place them even further back in time.

It is impossible to give exact dates for the divisions of the vast pre-historic period known as the Ice Age. The comparative lengths of these can, however, be indicated. There were four main epochs during which the Polar ice-sheet was thrust down from the north, smothering big European areas, and the snow-line of high mountains crept lower and lower, while glaciers crawled through valleys in which great rivers now flow. The ice, or glacial, epochs were separated by warm epochs—very much warmer than at the present time.

The following is one of the recent tables which give in years the proportionate lengths of the various epochs of the Ice Age:

- 1st Glacial epoch, 25,000 years.
- 1st Inter-glacial epoch, 75,000 years.
- 2nd Glacial epoch, 25,000 years.
- 2nd Inter-glacial epoch, 200,000 years.
- 3rd Glacial epoch, 25,000 years.
- 3rd Inter-glacial epoch, 100,000 years.
- 4th Glacial epoch, 25,000 years.
- Post-glacial epoch, 25,000 years.

It will be noted that the Second Inter-glacial epoch was of great length—eight times as long as any of the glacial epochs, while the Third Inter-glacial epoch was four times as long.

The climate of Europe became, during these Inter-glacial epochs, so very warm that animals from Africa wandered north and lived in areas which during a glacial epoch had



WEST EUROPE IN THE THIRD INTER-GLACIAL EPOCH

According to the Abbé Breuil the Straits of Gibraltar were open
and the Balearic group a great island

been as cold as is northern Siberia in our own time. Warmth-loving trees also flourished, and southern wild flowers spangled the rich green meadows. We know this was the case, because the bones of the southern animals have been found, and there are surviving traces of the distinctive vegetation of the warm periods.

Not only are there relics of extinct animals which lived in Europe during the epochs of the Ice Age, but also relics of extinct races of mankind. This is one of the most remarkable facts brought to light by modern scholars.

Every race of human beings in the world to-day belongs to the human species called *Homo sapiens* or Modern Man. Brown Australians with beetling brows, dark negroes with woolly hair and protruding jaws, yellow slit-eyed Mongolians, and the various types of dark-haired and fair-haired white men, are all representatives of Modern Man.

The earliest members of *Homo sapiens* or Modern Man reached Europe during the latter part of the Ice Age and appear to have come from North Africa by way of the Italian land-bridge which cut the Mediterranean into two parts. When they reached the hunting grounds in Western and Central Europe, they came into contact with a human species that was doomed to become extinct. This kind of man is referred to as *Neanderthal*¹ Man, after the Neanderthal cave near Dusseldorf in Germany, in which a great flat skull with large protruding brow ridges was discovered in 1856. For many years a vigorous controversy was waged over this skull. Some suggested it represented an extinct species of the Human family; others, protesting against such a view, contended

¹ Pronounced *nee-ān'dēr-tāl'*.

that its strange shape was due to disease, or that it was not human at all. A similar skull had been found at Gibraltar in 1848, but little notice was taken of it for many years. Then, in 1887, two similar skulls were unearthed at Spy, near Liège, in Belgium. Since then other skulls and a complete skeleton have been brought to light, and found to be associated with flint tools of quite distinctive character.

No doubt now remains that Neanderthal Man lived in Europe during part of the Ice Age and became extinct some time during the Post-glacial epoch. He was an ugly fellow, low-browed, with deep-set eyes under protruding eyebrow ridges, hardly any chin, and a very short neck. His body was thick-set and muscular; he walked with a stoop and bent knees, while his hands were large, and the movements of his fingers restricted. He could not walk very fast, nor could he run like Modern Man, owing to the peculiar structure of his legs and feet. When he went forward quickly, it must have been by short leaps. He was a "shuffler" and a "hopper".

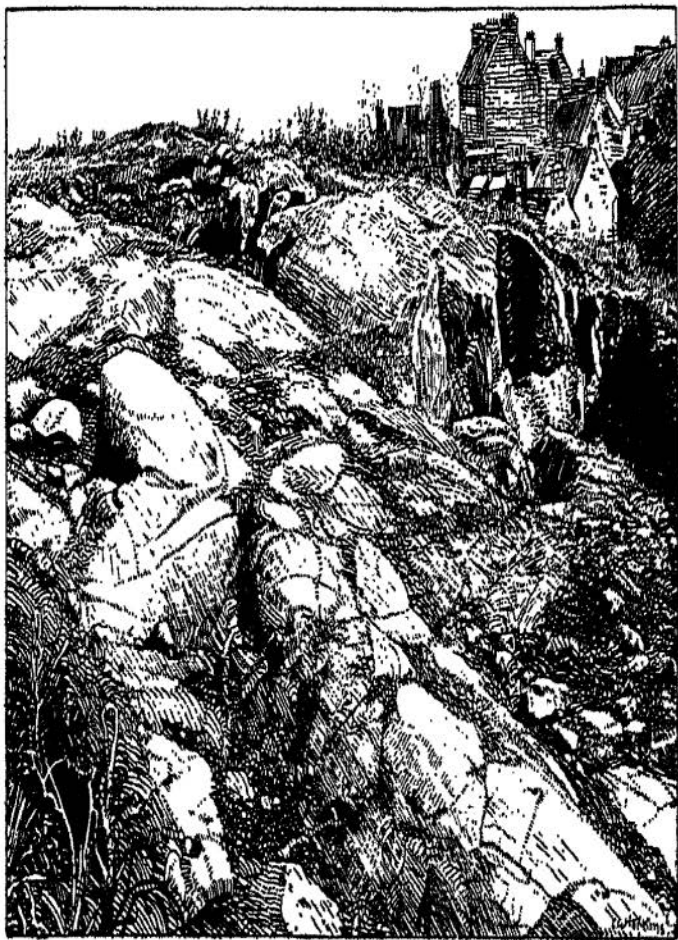
The pioneers in Europe of the modern species of mankind are referred to as *Cro-Magnons*, being named after the village of Cro-Magnon near Les Eyzies in the valley of the River Vézère in France, where parts of five human skeletons of distinctive type were discovered in the spring of 1868 in association with ornaments and tools that could be classified. The term Cro-Magnon applies to tall and short types of Modern Man of this period. Some were well over 6 feet in height, and others of medium stature, but all had large skulls with a full frontal development above the average of Europeans of to-day. Another contemporary race is represented by two skeletons found in a cave at Grimaldi, near Mentone,

on the Riviera. The skulls resemble somewhat those of the present-day Australian aborigines, the most primitive type of Modern Man. This ancient race, referred to as Grimaldi Man, appears to have entered Europe, like the Cro-Magnons, their contemporaries, from North Africa by way of the Italian land-bridge.

Somewhat later other peoples came from Asia, whose skulls were broader than, but not so long as, those of the Cro-Magnons. They have been referred to as *Brünn Man*, after the place in Moravia where the first find was made.

The artifacts (articles made by man) which have been found associated with the Neanderthal people are known to archaeologists as *Mousterian*, because they were first identified in the caves of Le Moustier in the valley of the River Vézère in France; those associated with Brünn Man are known as *Solutrean*, after Solutré, Saône-et-Loire, France; and those associated with the Cro-Magnons are *Aurignacian*, after Aurignac, Haute Garonne, France, and *Magdalenian*, after La Madeleine in the valley of the River Vézère, France. The Aurignacian artifacts were introduced from North Africa by the earliest Cro-Magnons and the Magdalenian artifacts are those of their later period.

When the great thaw which followed the last phase of the Ice Age was in progress, the Cro-Magnons were producing and using these Magdalenian artifacts which included barbed harpoons of reindeer horn. Apparently the climate was still severe, especially during the winter, and the reindeer still wandered about in Western and Central Europe, scraping the snow to find the mosses on which they fed. But gradually the weather improved. Warmth-loving animals were going farther northward and forests were spreading. Europe was



ROCKS (NEAR STIRLING) MOULDED BY THE PASSAGE OF ICE IN ONE OF THE
GLACIAL EPOCHS

then entered by a new race, a race of medium stature, with slighter body frames than those of the Cro-Magnons, and using quite different artifacts. They also made barbed harpoons, but of red-deer horn. Apparently the reindeer had moved northward, displaced by the forest-haunting red deer of a warmer period. The newcomers and their artifacts are referred to as *Azilian*, so-named after Mas d'Azil, a town at the foot of the Pyrenees where their relics were first detected. Another new industry, associated with the Azilian, is represented by very small worked flints, which, some think, were used as hooks to catch fish and to stick in wood to make harpoons. This industry is called the *Tardenoisian* after a French site in which the artifacts were first discovered. A third new industry is the *Maglemosian*, named after Maglemose, near Mullerup, on the western coast of Zealand. The northern part of Europe was cleared of ice and a people from Asia were settling in the Baltic area. At that time the Baltic was an inland fresh-water lake. The climate of Europe was gradually improving, and larger numbers of peoples were spreading westward and northward. New industries that followed one another after the Azilian, Tardenoisian and Maglemosian were the *Neolithic* (New Stone), the *Bronze*, and the *Early Iron*. Then came, at different dates in different areas of Western and Central Europe, the dawn of the historic period.

The following are the various Western and Central European industries thus far referred to:

Mousterian industry of extinct Neanderthal man.

Aurignacian industry—the early industry of Cro-Magnon man.

Solutrean industry of Brünn man.

Magdalenian industry—the late industry of Cro-Magnon man.

Azilian and Tardenoisian industries of a new race, apparently early representatives of the Mediterranean race—the dark, short, long-headed race.

Maglemosian industry of a Baltic people, perhaps early representatives of the Nordic or fair Northern race.

Neolithic (New Stone) industry—new industry of the Mediterranean race.

Bronze industry—imported from south-eastern Europe and adopted by various peoples as was also the Early Iron industry.

The French archæologists usually classify the Mousterian, Aurignacian, Solutrean and Magdalenian industries under the term *Reindeer Age*, which indicates the character of the climate that prevailed in Western and Central Europe before the period of the Azilian to Neolithic industries was introduced. British archæologists, on the other hand, have classified the industries under the terms *Palæolithic* (Old Stone) *Age* and *Neolithic* (New Stone) *Age*. They divide Palæolithic into Upper and Lower stages, the Upper being the later and the Lower the older. We thus have the following subdivisions:

Upper Palæolithic Age

1. Aurignacian; 2. Solutrean; 3. Magdalenian.

Transition Age

1. Azilian; 2. Tardenoisian; 3. Maglemosian.

New Age

Neolithic (New Stone) industry, followed by the Bronze Age and the Iron Age and then the Historic period.

The Lower Palæolithic Age is represented by the relics that lie below those of the Upper Palæolithic Age in stratified sites and are therefore older.

It has been shown that when Cro-Magnon man entered Europe, introducing the Aurignacian industry, the first of the

Upper Palæolithic division, he came into contact with Neanderthal man whose industry has been named Mousterian. A still earlier industry is *Acheulian*, called after the site at St. Acheul in the Somme valley, France, where it was first identified. Then earlier still was the *Chellean* industry, called after the town of Chelles, east of Paris, for a similar reason. There are thus three Lower (or Older) Palæolithic industries, namely:

1. Chellean;
2. Acheulian;
3. Mousterian;

followed by the three Upper Palæolithic industries:

1. Aurignacian;
2. Solutrean;
3. Magdalenian.

The most characteristic artifact of the Chellean and Acheulian industries is the "hand axe" which the French have named the *coup de poing*. Acheulian "axes" have a straighter edge than the earlier Chellean.

Of late years older artifacts than the Chellean have been identified and these are called pre-Chellean or pre-Palæolithic, or are classified as *Eoliths* ("dawn stones"). We cannot, however, connect the oldest of the industries with definite human races. The Cro-Magnons, as we have seen, introduced Aurignacian, the first of the Upper Palæolithic industries, and the third Lower Palæolithic industry, the Mousterian, was that of Neanderthal Man. The Chellean and Acheulian industries have not yet been definitely associated with a race, nor have the pre-Palæolithic industries.

Next comes the question of dates. In the absence of records our chronology must be regarded as speculative and tentative. We must also bear in mind that a particular in-

dustry began earlier in one area than in another. The following dates must be regarded as rough guesses:

Lower Palæolithic

Chellean and Acheulian industries, began about 500,000 years ago.
Mousterian industry, began about 50,000 years ago.

Upper Palæolithic

Aurignacian industry, began about 10,000 years ago.

After allowing several thousand years for the Solutrean and Magdalenian industries, and the three industries of the Transition period, the Azilian, Tardenoisian, and Maglemosian, we come to the Neolithic industry of Western Europe, which was introduced about 2000 B.C. or thereabout. The Bronze Age began about 1500 B.C., and the Early Iron Age about 600 B.C. The Neolithic Age of Northern Europe began some time later than that of Western Europe; the northern Bronze Age was likewise later.

When, however, we pass to south-eastern Europe, we find that the Bronze Age began in Crete about 3000 B.C. In ancient Egypt and ancient Mesopotamia metals came into use earlier than in Crete. Civilization began when and where the Hunting period came to an end—that is, when the agricultural mode of life was introduced. Of course the inhabitants of agricultural areas did not cease to hunt and fish, but they were able to store the cereals they cultivated and therefore to provide food for larger numbers in a definite area than was possible before they began to grow crops. Agriculture was introduced in Egypt and Mesopotamia about 4000 B.C. and progress was rapid during the ensuing centuries. The long Palæolithic Age was one of stagnation. New ways of making implements were introduced, but as the food supply was obtained by killing

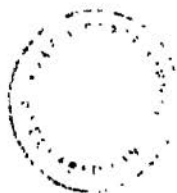
wild animals and catching fish, the population of a given area could never have been large. A family of hunters required a wide district from which to supply their needs. When, owing to bad weather and other causes, the animals became scarce, there must have been periods of famine and heavy death-rates. Progress was impossible because the hunters could not form settled communities, and because their movements depended upon those of the animals on which they fed. Nor, apparently, had they learned how to preserve flesh and fish by salting, drying or smoking.

When the Neolithic industry was introduced into Western Europe, artifacts were shaped not only by chipping flint and other stone, but by using a grinding-stone to procure a sharp edge. But this was not the only change. Eastern influences brought to Western Europe the agricultural mode of life—the seeds of cereals and the necessary agricultural implements, as well, of course, as the knowledge of how to prepare the land for growing crops and how to reap and grind and cook the yield of the harvest. Food could then be stored for the winter period when hunting and fishing were more difficult than in genial weather. Withal, larger numbers could reside in a particular area.

The dating of the early hunting period is the most difficult of all. It has already been shown that the comparative lengths of the various Glacial and Inter-glacial epochs can be indicated, but there is no agreement as to the total period covered by the Ice Age. Calculations vary from 100,000 years to 840,000 years. Some recent writers regard 500,000 years as the minimum. But before the Ice Age began there were races of early man in Western Europe, including Britain, which was then joined to the Continent by a land-bridge. The traces

of the early peoples and industries of the pre-Glacial epoch are dealt with in Chapter I.

Nor is it certain as to what particular periods of the Ice Age the various Lower Palæolithic industries (Chellean, Acheulian and Mousterian) should be assigned. Some place the earliest phase of the Chellean industry in the Second Inter-glacial epoch, and others in the latter part of the Third Glacial epoch. The Mousterian industry may have begun in the Third Inter-glacial epoch, as some think, but it appears to have existed in the Fourth Glacial epoch and to have vanished with Neanderthal man early in the Post-glacial epoch. The Cro-Magnons, who introduced the Aurignacian industry, entered Europe during the early Post-glacial epoch. About that time the ancestors of the ancient Egyptians were spreading through the Nile Valley, and they began to practise the agricultural mode of life many long centuries before the Hunting period came to an end in Western Europe.



FOOTPRINTS OF EARLY MAN

CHAPTER I

The Earliest Hunters

Before beginning the story of the earliest hunters we must first glance briefly at the wonderful story of the early world.

The geologists have discovered that the "crust" of the earth is arranged in a series of divisions which they call "beds". These beds belong to different periods of time, and all of them contain traces of ancient life.

The oldest or lowest bed is called the *Primary* system, and it is followed in turn by the *Secondary*, the *Tertiary*, and the *Quaternary* systems.

The *Primary* system contains the remains of early fishes and land plants. In its "later" or "upper" part are the coal measures, which were formed by tree-ferns and other plants.

The *Secondary* system contains the remains of numerous fishes and of the gigantic reptiles, some skeletons of which are preserved in museums. Oak trees, walnut trees, and fig trees have also been traced in this system.

In the *Tertiary* system are the remains of many plants and animals somewhat similar to those of our own time.

The *Quaternary* system has numerous traces of the Great Ice Age, and also of many animals and plants existing at the present day.

All these systems represent vast periods of time—many millions of years—which are usually referred to simply as “ages”.

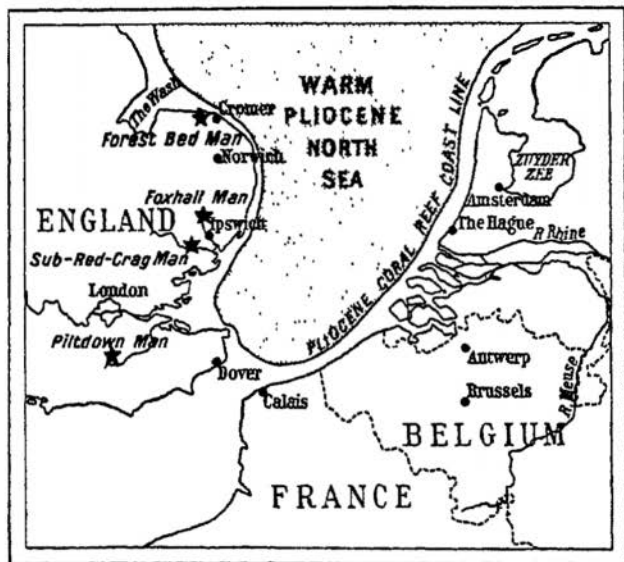
As this book deals with early man our chief interest is in the *Tertiary* (or third) Age, and the *Quaternary* (or fourth) Age, for it is in the beds or layers of these ages that the earliest traces of human beings have been found.

In far-off *Tertiary* times, and many centuries before the beginning of the Great Ice Age, groups of primitive hunters reached and settled in the country which we know as England. They came from the south, but had not to cross the sea, for the area now swept by the surging tides of the English Channel was then a pleasant green valley with silvery rivers and thick rustling woods, while a long unbroken range of grass-covered chalk hills stretched from the North Downs to the land which has been called France.

The North Sea was then as warm as the waters that wash round the West Indies in our own time. There were white and red coral reefs on the coast-line, which then in places curved several miles beyond the present coast-line of eastern England, round to the areas now known as Belgium and Holland. The summers were hot, and the winters brought no frost or snow. One could have cultivated sugar-cane, bananas, and coco-nut trees in England in those far-off times.

Geologists have traced the wonderful history of the Tertiary period in East Anglia, which has been less invaded by the

sea than other parts of eastern England. They apply the name "Crag" to various formations or "beds" of gravels and of sands containing ancient shells, &c., which date back to very remote times.



England and North Sea in Late Tertiary Period (after Osborn)

The earliest formation which interests us is the "White Crag" or "Coralline Crag", but it must be borne in mind that "Coralline" does not mean a coral formation. The ancient coral-reef lies above the "White Crag", and as it has been more or less coloured by oxide of iron, it is known as the "Red Crag". Above the "Red Crag" is the later "Norwich Crag", and above the "Norwich Crag" are the "Chillesford beds", and then comes the "Weybourn Crag".

The successive "Crag" tell the story of a gradual cooling of sea and land temperatures. In the older formations the relics of southern or warm-country forms of life are plentiful. Then these decrease in numbers and some vanish. Shell-fish from the colder waters in the north came gradually southward, and in the course of time Arctic molluscs were living round the shores where formerly the little animals which formed coral were at work for thousands of years. The shores were then bleak and treeless and cold. Sheets of ice, the remains of icebergs, came drifting down the North Sea, and in some were embedded big boulders, which stranded on beaches and can still be seen.

In time the climate improved gradually, until once again the trees flourished along the coasts, and the formation known as the Cromer Forest Bed deposits came into existence.

Traces of Early Man have been discovered by Mr. J. Reid Moir, Ipswich, at the base of or below the "Red Crag" formation on the surface of the "White Crag" formation. Human beings were, therefore, in England when the coral-forming animals were beginning to secrete from the warm waters of the North Sea the carbonate of lime, &c., of which coral is formed. No human bones of this period have been brought to light, but numerous flints, which some call "eoliths" (dawn-stones), sharpened and given desired forms by human fingers directed by intelligent minds, testify to man's presence in East Anglia. When the weather was growing cooler men's minds were growing "sharper", and fires were lit to give warmth and to cook food.

When the earliest groups of human hunters reached the Thames Valley in Tertiary times they saw many animals, including reptiles, that do not live in modern England. The

hippopotamus cropped the herbage on the site of London and swam and dived in the river. Big tortoises crawled over the gravel and, when the sun was high, dropped into pools to refresh themselves. In the woods were deer with wide antlers, and these were preyed upon by the fierce sabre-tooth tiger which had two long tusks curving downward from its upper jaw. A type of rhinoceros, with sharp horns on its snout, prowled through the bushes, and the powerful mastodon, a variety of elephant, fed on succulent leaves and herbage. Hyænas and wolves were numerous, and there were small and large bears. Nimble and many-coloured lizards could be seen flitting about on their insect-hunting expeditions. In the long grass and creeping up the trunks of trees were beautiful but poisonous snakes, some quite small, others very long, and all very rapid in their movements. The poisonous snake must have been one of the most dreaded enemies of early man.

Among the pretty and harmless animals were little horses with three toes, nimble gazelles and antelopes, and large numbers of land and water birds. In the trees were long-armed apes something like gibbons and also small monkeys.

Traces of the ancient people who lived by hunting are nowadays found chiefly in East Anglia, which, as stated, they certainly reached during the Tertiary period.

We are not sure what Tertiary man looked like, but it is certain he was not particularly tall and powerful. His strength was in his brain. He could think and remember, and he could make his thoughts and experiences known to his fellows by means of speech. The language he spoke had been gradually invented by the generations that had lived before him, and the number of words in use was always increasing.

Wild animals could, as they still do, utter cries that expressed

emotions, cries of alarm, anger, pleasure, and so on, but man alone among living creatures was able to tell of what had happened, give instruction to the young, and discuss things that interested him.

Withal, Tertiary man could make plans and lay down rules of conduct and arrange for division of labour so that each member of a community might know and perform his or her duties. It was necessary that the early people should live in groups for their mutual protection.

Early man had one special accomplishment which gave him a great advantage over the big and powerful animals. He used tools which he had made or selected for himself. By working with his hands he helped to develop his brain, and the more his brain developed the more skilful he became. It was as an artisan and a thinker that man became the "lord" of the ancient world.

The earliest tools appear to have been of wood and bone. Before coming to the country now known as England, the hunters had, however, begun to make use of flint. They discovered that this material could be split up and chipped and made into cutting and scraping tools.

Now, flint is harder than iron, but being very brittle it can be more easily worked when a lump (called a nodule) is properly split up. The thin flakes have keen edges that cut like a modern knife. One can sharpen a pencil with a little flake of flint.

At first man may have utilized suitable bits of flint that he had picked up, but, as we find, he soon began to chip selected pieces so that these might be made more useful as tools. Some of the artisans were, no doubt, cleverer than others and invented new forms which in time were generally adopted.

The working of flint demands no little care and skill, as anyone will find who attempts to shape tools like those of the ancient artisans. A nodule of flint which is to be chipped into a handy tool should first be laid on something which yields to a blow and not on a bare stone, otherwise it will be badly shattered.

At first flints were "dressed" by chipping. In time they were divided and the core was used.

The ancient flint-worker probably used a bit of turf which was laid on some harder substance. Placing the selected flint nodule on this "pad", he struck it with a stone and split it. A quick deft blow or two separated flakes of different sizes. Selecting one piece which came nearest to the form he wanted, he used a smaller and pointed piece to chip and scrape it round the edges. When this was being done the larger flint was held tightly in the one hand and the smaller one in the other.

Some flints were used as tools to make tools, some to shape other flint implements, and some to shape tools of wood and bone by means of scraping.

The most ancient flint implements are nowadays discovered in gravel pits, old river terraces, &c., along with the bones of Pliocene animals or other relics of that far-distant age.

It is not always easy to distinguish "eoliths" which have been partly shaped by human hands from flints that have been flaked by pressure in the soil or by being rolled in river gravel. When, however, it is found that collectors have picked up quite a number of specimens that had been chipped in exactly the same way and from the same angles, it becomes apparent that such regular and systematic chipping could not have been purely accidental—the result of mere chance. We have

to conclude that in such examples we must recognize the influence of the intelligent mind of man and the work of skilled human hands.

One particular type of Pliocene "eolith" is found at the base of, or beneath, the "Red Crag", Ipswich. It was shaped from a carefully selected piece of flat flint. One end was held between the thumb and forefinger; the other end was chipped until it was shaped like an eagle's beak; from the point of the "beak" the worker formed an edge which we call the "keel".

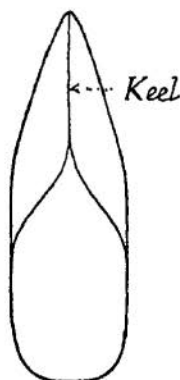
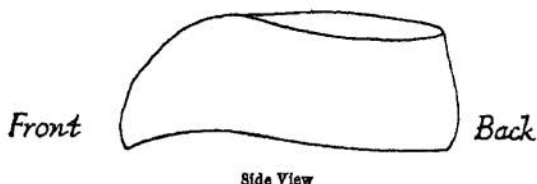
This little tool has been named the "rostro-carinate" (beak and keel) flint, and, so far, specimens of it have been found in East Anglia only. It may thus have been invented by the early inhabitants of present-day England.

When Early Man had begun to make use of flint he must have searched for the places in which it could be obtained. Experience would teach him in time where to look for the raw material, and he would find it convenient to settle in flint-yielding areas. Indeed, it is in the districts where there is chalk—flint being found chiefly in chalk—that the flint tools of the early hunters are now discovered in largest numbers. Apparently the population in Pliocene times was most dense in chalk districts, just as to-day it is, on the whole, most dense in the districts in which coal and metals are found.

Ancient flint implements are, however, discovered also in districts where there is no chalk, and this fact may be taken as an indication that the workers in flint-yielding areas exchanged their handy tools for other things they required. It is found too that the hunters who lived at a distance from the chalk belts made some use of stones, other than flint, of

suitable shapes and sizes and endeavoured to work them as flint was worked. The mind of man was active, and sought out many inventions.

In ancient days, however, the progress made was slow



Seen from under

Rostro-carinate Flint Tool (Ideal Form) after Reid Moir

because so much time was occupied in procuring food. Man was surrounded by many perils. Beasts of prey were numerous, and when the animals on which human beings fed grew scarce, there must have been famines and heavy death rates in stricken communities.

Mr. J. Reid Moir's notable discoveries of the "eoliths"

of Early Man in East Anglia are given as follows by Professor Henry Fairfield Osborn of Columbia University, U.S.A.:

- (1) Rostro-carinate flints from the base of the Red Crag, Ipswich, or beneath it: of Pliocene Age.
- (2) Foxhall flints from the coprolith quarries, near Ipswich: of the Pliocene Age of Mammals.
- (3) Giant flints of Cromer, of the early Pleistocene Age of Man, from the Forest bed deposits exposed at the end of the bathing beach below the cliffs of Cromer, of about the same age as the Heidelberg man of Germany.

CHAPTER II

How the Ice Age Began

The Pliocene ("more recent") Age of the Tertiary period of the world's history was followed by the age called the Pleistocene ("most recent") or the Quaternary period.

During the greater part of the Pliocene Age the climate in the country we now call England was much more genial than it is in our own time. There were long warm summers and short and mild winters, and the hunting people did not require to live in caves.

In the deep forests there were trees that now grow only in the south of Europe, and there were also trees that have become extinct as have the huge animals which fed upon their leaves. In the rivers and lakes and on the sea-coasts were shell-fish that are not now found farther north than the Mediterranean area. The shells of these ancient molluscs are, as stated, discovered in Pliocene deposits.

Before the close of the Pliocene Age, however, the climate

in our northern regions began gradually to grow cooler. The winters were then longer and more severe than they had been, and the summers shorter and less warm. Many trees became stunted in growth and hardier trees grew more numerous. The southern molluscs vanished and the big mammals migrated southward. All the apes and monkeys disappeared. It may be that many members of the hunting tribes left the country we know as England.

Early in the Pleistocene Age very severe weather prevailed during the winter. In the spring icebergs drifted down from the north, and, entering the estuaries, choked them so that the rivers flooded and caused much destruction. The hills of the area now called Scotland were capped with snow even in the summer season and small glaciers were being formed. Cold piercing winds blew from the north and east.

The climate grew colder and colder. In the course of centuries great ice-packs pressing down from the Arctic regions gradually covered the countries now called Norway and Sweden, and remained throughout each short summer. The Baltic was frozen over in winter, and the ice ultimately became so thick that it remained unmelted during the whole year. Every winter the ice area extended, until in time it reached and remained in Northern Germany. This was the first phase of the Great Ice Age.

We do not know with certainty what caused the northern ice-field to extend gradually and cover a great part of Northern Europe. Other areas were similarly affected. The glaciers of the Alps grew deeper and longer, as likewise did those of other great mountain ranges through the world. It may be, as some suppose, that great changes were taking place in the sun, that, for some reason which we can only guess at, the

supply of heat and light reaching the earth had been reduced.

Scientists tell us that the sun is always changing in our own time, and that the sun spots, which are supposed to be caused by disturbances called "solar storms", increase and decrease in regular cycles. They calculate that if, on account of mysterious solar changes and the obscuring of a part of the sun's surface, there should, for a period of years, be a decrease of only two per cent in the present supply of sunlight, the climate in every part of the world would be greatly altered. "In a few centuries," one writer says of such a change, "it might easily cause the return of the great ice-sheet." On the other hand, an increase of two per cent of solar energy would make some of our northern lands as warm as are the tropical districts at present. Two per cent of the sun's heat, it has been calculated, is about equal to the heat of two million tons of coal burned in a minute or nearly three billion tons burned in a day.

The Great Ice Age was divided into four main periods of different length, and between these there were long and warm inter-glacial periods. It must be borne in mind, however, that the changes of climate did not take place rapidly, but very gradually over prolonged periods of time.

When the earliest phase of the Ice Age, that is, the first glacial epoch, was passing away, the ice-sheet began slowly to shrink in Scandinavia, and each summer great torrents poured down from the hills. Their beds became deeper and deeper and immense quantities of soil were displaced. Owing to the ravages made by floods the natural features of the country were greatly changed.

As the winters grew shorter and milder, the climate of northern Europe greatly improved until it became much

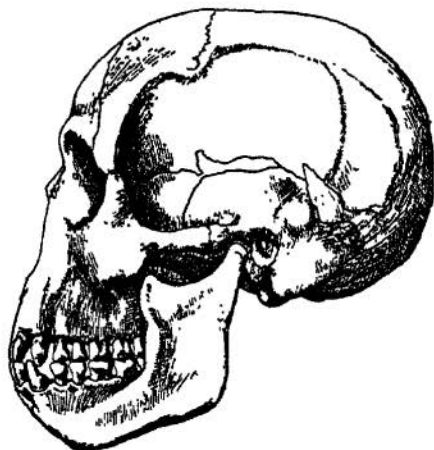
warmer than it is now. The First Inter-glacial epoch had been ushered in, and it lasted longer than did the First Glacial epoch.

The earliest known human remains found in England, which are portions of a skull, are believed by some scientists to belong to the First Inter-glacial epoch, but others think they should be regarded as of somewhat later date. The skull is a female one, and the race which it represents has been named "Piltdown" because the find was made in a gravel pit at Piltdown in the Sussex Weald. Some labourers, who were obtaining material from this pit to repair a road, broke and threw away the skull after removing it. It chanced, however, that Mr. Charles Dawson, a well-known scientist, picked up and examined a fragment. He saw that the bone was very thick and that it was fossilized, a sure indication that the skull was a very ancient one.

Searching through the gravel, Mr. Dawson recovered other pieces of the skull. The pit was afterwards turned over and carefully searched, and other relics came to light, including flints resembling eoliths and an implement which has been made from the thigh bone of an elephant and shaped somewhat like a modern cricket bat, with the "handle" end pointed.

Scientists engaged themselves in fitting together the bones of this ancient human head, and although portions were missing, the original form was well suggested. It was found that the thick-skulled members of the Piltdown race had comparatively large and smooth foreheads, but their lower jaws retreated so much that they could not have been very handsome. If, however, they had bright, intelligent eyes their faces may have been quite pleasant.

The well-formed Piltdown skull protruded a good deal at the back, and scientists have found that the brain in this region has more to do with vision and hearing and with storing up memories of things seen and heard, than with thinking and inventing. It may be that Piltdown man was a splendid tracker and excellent hunter. He probably had wonderful



Reconstruction of the Piltdown Skull

By permission of Professor G. Elliot Smith.

vision and could distinguish things at a greater distance than we can, and observe close at hand traces of animals which escape our attention.

One cannot help wondering, however, how Piltdown men and other early hunters were able to kill the big animals on which they fed. Their flints were small and not of much account as weapons. Eoliths could have been used only to scrape flesh off bones, to cut through a slain animal's hide,

or to shape tools of wood and bone. Perhaps the bat-shaped bone tool found in the Piltdown gravel pit was fashioned by a worker who used eolithic tools. It may be, on the other hand, that the eoliths were shaped by representatives of a different race.

When we come to consider the facts that have been accumulated regarding the early hunting age of man, it is of very special interest to find that the bones associated with his relics are chiefly those of young animals. Apparently, it was easier to catch and slay young elephants and deer than fully grown ones.

Now, it is well known that wild animals always protect their young and attack furiously any man or beast that interferes with them. When these animals migrate from place to place, and move to and from feeding grounds, the young generally walk in front. Modern hunters tell us that when elephants go down to a river to drink, the young are closely followed by the mothers.

If the primitive hunters had attacked the young animals in the presence of the big ones they would have run serious risks. They must, therefore, have depended on trapping. Perhaps they dug pits which were covered over with branches and grass. The bat-shaped implement of Piltdown may have been a combined pick and spade used for making pits in the sandy river banks.

When a young elephant, being in front of the mother, fell into a pit, the mother would no doubt remain near the pit for a time, and have to be driven away.

The early hunters had no weapons, such as arrows or darts, to hurt and scare big elephants. They could, however, light fires. Burning brands flung at a wild elephant would make

it run. If the hunters could not safely venture near enough to an elephant to fling anything at it, they could set the dry grass on fire and thus force it to retreat.

Positive evidence of the use of fire by man has been obtained in connexion with human relics of a later period than that of Piltown man. It is possible, however, that on account of the severity of the climate, fire was used even before caves were chosen as dwellings.

The important discovery that fire could be made of service to human beings is certainly of great antiquity. In our own day we have much respect and admiration for the inventors who first made use of steam and electricity. These were great men who have conferred priceless benefits on the human race. We should similarly admire the ancient discoverers who first made fire captive and showed how it could be used with safety and to man's advantage not only to give warmth but to scare away beasts of prey.

At first fire may have been obtained from blazing logs at the edge of a forest which had been set in flames by lightning. In time men learned to keep a small fire burning so as to kindle other fires from it. Some savages in our own time keep smouldering logs in their villages, and when these are suddenly extinguished by heavy rain, they go in search of fire. Early man may have done the same.

After fire came into use in ancient times, the next great discovery made was how to produce it. It may be that the busy flint-workers sometimes picked up and used iron pyrites, striking sparks from flint. Then some man with an inventive mind would discover, after experiment, that when he directed showers of sparks into dried grass and leaves he could blow the smouldering parts into flame.

Another discovery of importance was that sparks issued from certain varieties of wood when rubbed together. Perhaps it was made when an artisan was endeavouring to scrape a piece of wood into a tool with a harder piece. The use of "fire-sticks" was then introduced. In time—many centuries later—the "fire-drill" was invented, but, as one can realize, it could never have been thought of until after man had advanced step by step on the path of progress. First he had to use fire, then he had to produce it, and finally he had to find how it could be produced more quickly than before; and, in districts where flint and iron pyrites could not be got, by some other means.

It should not be assumed that because man had many needs he was bound, sooner or later, to satisfy them as a matter of course. He was not really aware, for instance, that he required "fire-sticks" before fire came into use. The path of progress was a hard and tedious one and all peoples did not advance at the same rate or in the same way. There are living in the world to-day backward peoples who have not made much progress during thousands of years.

We owe much to the early thinkers and inventors who introduced many useful things which are to us the common-places of daily life. They laid the basis on which the fabric of civilization has been gradually built up.

CHAPTER III

Cold Periods and Warm Periods

The Second Glaciation was a much greater one than the first. It extended over a wider area and it lasted longer. Not only did the Scandinavian ice-field move southward towards Germany as in the First Glacial period, but westward towards Britain. The North Sea plain suffered greatly. At first the river mouths were blocked by icebergs that had drifted down from the Arctic and a great deal of flooding took place. Big lakes and marshes were formed and ultimately the plain was completely submerged. Then cold Arctic currents swept southward bringing icebergs which stranded on the coast of modern Norfolk. In time the ice-field crept across the shallow North Sea, and then Scotland, Ireland, and the greater part of England, as far south as the Thames and Severn valleys, were covered with ice which grew thicker and thicker as the centuries went past. The pressure of the "ice pack" was constant and great. Valleys were choked with ice, rivers were frozen solid, and glaciers crept down from the mountains. The great ice-field was pushed gradually westward into the Atlantic area for over fifty miles beyond the present western coasts of the British Isles. If one could have crossed the Atlantic Ocean from America during the period of the Second Glaciation, one would have seen great cliffs of ice several hundreds of feet high stretching far to the west of the British Isles.

Scotland then resembled the regions round the North Pole. The ice-sheet that lay upon it was so thick that only the white

tops of the highest mountains could be seen. At the present time one can find ice-scratchings on the mountains of western Ross-shire to a height of about 3500 feet, but in the Outer Hebrides the marks left by the ice are not found much higher than about 1550 feet. It would seem, therefore, that the great ice-fields sloped gradually downward from the mountains of western Scotland towards the "ice-cliffs" in the Atlantic. From these ice-cliffs big icebergs drifted southward, carrying boulders that had been carried down from the Scottish hills by great glaciers. These ice-borne boulders are called "erratics", and some of them were stranded on the Azores where the icebergs gradually melted.

From Scandinavia the ice-field was pushed southward across the Baltic and eastward across the Ural mountains. The greater part of Russia was covered with ice. Modern Denmark, Holland, and Belgium were completely buried. It has been found that in Denmark the ice was 2500 feet thick. The ice-field covered much of modern Germany, and in the Berlin area was about 1300 feet thick. In Norway there were "mountains of ice" to the height of about 7000 feet. When the ice-field moved eastward across Europe its progress was arrested by the Carpathian Mountains.

In central Europe the Alpine ice-field stretched northward to the Jura Mountains, eastward to the outskirts of modern Vienna, westward to the edge of the Rhone valley in France and southward into northern Italy. Glaciers crept down the mountains of France, and a thick and heavy ice-field stretched out from the Pyrenees into modern France and Spain. Even the Sierra Nevada range in southern Spain had its glaciers, as had also the Atlas Mountains in Morocco.

Italy had a severe climate. There were small glaciers in

the Apennines. Along the northern shores of the Mediterranean Sea were molluscs that nowadays are found only in the North Atlantic. Egypt was not then a hot country, but it had a pleasant climate and much rain fell. Thick forests flourished between the Nile and the Red Sea and the present Sahara desert had grassy plains, wooded hills, lakes, and rivers.

There were great masses of ice in Asia Minor, and northern Asia was covered with ice like northern Europe. The high mountain ranges of central Asia were also ice-fields, and thin glaciers moved over wide areas. Canada and the northern parts of the United States lay under ice. Traces of the ancient glaciers still remain near modern New York. The Rocky Mountains had long and heavy glaciers. There were ice-sheets also in South America. The higher parts of the Australian, Tasmanian, and New Zealand mountains were covered with ice.

The great changes which took place all over the world during the Second Glaciation were brought about very slowly and over a vast period of time. Century after century the climate grew colder and colder. Then, after the limit of glaciation had been reached everywhere, the winters gradually grew milder and shorter, and the summers grew longer and warmer. In the course of time the various ice-fields began to retreat. Great floods were caused when the ice-fields were melting. Rivers were swollen heavily and roared in the valleys, which were cut and torn deeply. Big lakes and wide marshes were formed in areas which are nowadays covered with forests and farms, cities and towns and villages.

Many centuries went past, and then came on very gradually the warm Second Inter-glacial period—the longest of all the

periods of the Pleistocene Age. To realize how long the period was, it may be explained that it was followed in turn by the Third Glacial period, and then the Fourth Glacial period, which was the last. The Second Inter-glacial period was longer than the entire period from the beginning of the Third Glacial period till the present time. One estimate of its length is 200,000 years.

At the beginning of this Second Inter-glacial period the land gradually rose. The cause of this change is not definitely known, but some scientists suggest that the great burden of ice which had lain for many centuries on a large portion of land had caused it to sink, and that when the ice melted the land rose like a sponge which has been pressed down by one's hand and then released.

When the land rose, the North Sea plain was restored, as was also the valley of the English Channel. The land movement was not, however, confined to the northern area. Italy was once again united with North Africa so that the Mediterranean Sea was cut into two. Europe was connected with North America, which stretched from the north of present-day Scotland to Iceland and Greenland, while Asia was connected with North America by a "land-bridge" stretching across the present Bering Straits.

Europe having grown warmer—much warmer than it is nowadays—large forests flourished far and wide. Warmth-loving animals from Africa and Asia wandered into our forests, reaching as far as present-day Britain. These included the broad-nosed rhinoceros with two horns, and the big hippopotamus. There were two types of elephants—the gigantic southern mammoth and the straight-tusked elephant. The ferocious sabre-tusked tigers returned to the haunts of their

ancestors but were not so numerous as formerly. There were, however, a good many African lions in Europe.

The beasts of prey found plenty of food. Herds of wild horses grazed on hill slopes and on the plains, and there were herds of bison and wild cattle. In the forests were various types of deer, from the little roe-deer to the giant deer and the big moose with its flat broad face and massive antlers. Bears, wild pigs, wolves, big wild cats, and beavers, as well as a great variety of birds, were to be found in Europe, and there were many reptiles, including big serpents.

Human beings lived in Europe during this warm Second Inter-glacial period. They were of different races, but, as they lived in the open, and not in caves as at a later period, few remains of them have been found. A heavy human jaw was discovered in 1907 at a depth of about 78 feet in a sand-pit at Mauer, near Heidelberg in Germany. Near this ancient relic were found the bones of some of the beasts of prey that lived in Europe during the long Second Inter-glacial period. Little can be said about "Heidelberg man" (as he is called), except that he must have differed from the Piltdown man. His jaw suggests that he was of very powerful build. It may be, indeed, as some think, that he used his jaw like a tool to kill and tear as do some of the modern Australian savages. We do not know whether or not he worked flint. It may be that he was not of so high a type as Piltdown man, but resembled more closely a later race, which differed very much from the early hunters with nimble fingers and large foreheads who lived in the area known as East Anglia.

Another type of man who seems to have lived during the Second Inter-glacial period is represented by a skull called after Galley Hill in Kent, where it was found in a gravel pit

in 1888. "Galley Hill" man, as he is known to scientists, had a large brain, and resembled modern man more closely than did Piltdown man.

CHAPTER IV

Ancient Animals in Asphalt and Ice

When the early hunters were living in the country we now call England, there may have been similar types of human beings in North America, but no traces of them have yet been found. There were, however, numerous animals and reptiles, and when the ice-sheet crept southward from the Arctic regions they were forced to retreat before it.

In the modern state of California the skeletons of hundreds of early Pleistocene animals have been discovered in a wonderful state of preservation. The region is rich in oil, which here and there bubbles up to the surface of the ground, forming what are known as "tar pools". Some of the pools which existed in Pleistocene times have long been hardened into asphalt "beds" and modern pools have formed near them. In these beds are found the bones of extinct animals, many skeletons being quite complete.

One famous tar-pool area in California bears the Spanish name of Rancho-la-Brea ("Ranch of the Tar Pools"). The pools are surrounded with cactus and other trees and covered with thin sheets of water. If a wild animal is tempted to drink from one of them, it runs the risk of being caught in the tar and when that happens it perishes miserably, for it is gradually sucked down by the liquid and smothered.

During the early part of the Ice Age, when the surrounding mountains were covered with snow, large numbers of animals were entrapped in the ancient "tar pools". The least intelligent, including the bison, the sloth, and the American camel, were the most common victims. Wild horses were caught occasionally. In a single asphalt pit were found the bones of no fewer than seventeen elephants, but these had not all perished at the same time, because the ancient pool was comparatively small. Greedy beasts of prey often perished in the ancient "tar pools". The big wolf is well represented among the finds. Apparently, when an elephant or horse was caught in a pool, its cries of distress attracted prowling packs of wolves which leapt at the poor victim, only, however, to be themselves caught in the tar from which they could not possibly escape.

Tragedies of this kind were numerous, and occasionally there were fierce conflicts at the pools between the larger and stronger animals. Mr. Charles R. Knight, an American artist, has recently painted a vigorous picture of a tar-pool scene in the Pleistocene Age. He undertook this interesting work after making a close study of the numerous skeletons of the extinct animals which have been recovered from the asphalt pits of Rancho-la-Brea. The substance in which they lay has preserved even the fragile bones of birds.

The picture shows a snarling sloth with its legs securely caught in a tar pool. Two other sloths have come to its assistance in response to its cries of alarm. On the opposite side of the pool is a fierce sabre-toothed tiger with jaws a-gape, ready to spring at the entrapped victim. The three sloths are growling angry defiance, and the two which are free have risen on their hind legs to fight with their long curving claws,

which are powerful weapons. A second sabre-toothed tiger comes up to take part in the battle, and on the branches of a tree near the pool are vultures waiting patiently to feast on the bodies of any of the animals which are killed and partly devoured.

One can tell from a glance at the picture what is to happen as soon as the fight begins. The sabre-toothed tiger which is to leap at the sloth in the pool will itself be caught in the tar, and the same fate awaits the other tiger and the two sloths on the bank which are rearing to receive the tigers.

After the struggling animals have fought their last fight and, torn and bleeding, sink exhausted in the treacherous tar, the vultures will pounce upon their bodies and begin to gorge themselves. They, too, will perish, however, for the tar will smear their wings and claws and make it impossible for them to escape. Other vultures flying through the air are likely to become victims also.

In the background is a herd of gigantic elephants. These animals have paused as if scared by the snarling tigers and howling sloths, and seem to be about to turn towards another water-covered tar pool to slake their thirst. At least one of them is sure to become a helpless victim.

In an American museum some of the skeletons of Pleistocene animals have been set up so as to illustrate how they perished in one of these terrible pools of tar. A gigantic sloth is shown lying in the pool. Over it, with its mouth agape, stoops a tiger whose legs are sunk in the tar, and on the bank crouches a big wolf which fears to approach the tiger so long as it is able to growl, but it will leap down when that fierce animal becomes silent, and it, too, will be caught in the tar, from which it cannot release itself.

At McKittrick, about 120 miles distant from Rancho-la-Brea, large numbers of birds were entrapped in the tar pools which were covered with thin sheets of water. Flocks of ducks and geese flying from a distance descended to the pools without the least suspicion of danger, and never rose from them again. Herons, storks, and cranes wandered into them and were caught as securely as they might have been in snares. Pigeons, turkeys, quails, cuckoos, swallows, larks, plovers, crows, ravens, and other passing birds went to drink at the pools and never were seen again. Then birds of prey, seeing ducks, geese, &c., struggling in the tar, pounced down to seize the victims and they themselves were entrapped.

These tar pools, in which so many animals met their doom, have preserved for us valuable evidence regarding early Pleistocene times. Scientists are enabled to make a close study of the bones of extinct animals, and also to throw light on the migrations of those animals. The giant mammoth, which became a victim in a Rancho-la-Brea tar pool, was, for instance, a type which had wandered into America from southern Asia. The ground cuckoo came from the same area. Other animals had crossed into America by the land-bridge which connected that continent with north-eastern Asia. The sloths had migrated northward from South America. A specially interesting animal was the Pleistocene American camel. It differed from the true camel of Asia and from the llama of South America. Scientists regard it as a link between these two animal types. Most of the beasts of prey were common to North America and northern Asia. The wild horses were numerous along the Pacific coast of the American continent, but they disappeared during the last stage of the Ice Age.

Some of the animals which were trapped were forest-lovers. Their presence in the hardened substance of the ancient tar pools gives us clues as to the climate in which they lived. When the American camels were preyed upon by the American lions in southern California, there were wide grass-lands and clumps of forest in which tapirs and elephants and sloths prowled about. The trunk of a cypress tree was found in one of the hardened "beds". Apparently a tar pool bubbled up through its roots and it was gradually sucked down into its depths as the pool grew deeper and wider.

When the Ice Age was at its height, the winters became severe and long and the summers comparatively cold and short. Many trees perished and others were stunted in growth. The grass-lands were frozen and ruined as feeding-grounds for the greater part of each year. Deprived of their food-supply, the herds of wild animals that fed in forests and on plains were forced to migrate and many became extinct, as did the wild horses. Many carnivorous animals that preyed upon them perished also.

The story of the Ice Age is in every part of the world a tragic story.

In northern Asia the bodies of ancient mammoths, which perished miserably owing to the intense cold and the scarcity of food, have been found embedded in cliffs of "fossil ice". These great animals had been in the habit of browsing on the willows and alders that grew round inland lakes and on the banks of rivers, and as the winters grew longer, they found it more and more difficult to keep up the struggle for existence. Some were frozen to death during the winter, and the ice then formed round their bodies. Hundreds of years went past and the ice did not melt.

When milder weather came on, the ice, which in some places formed thick cliffs, was covered over with loam and sand, which protected the dense and hard masses from the heat of the short summer suns.

Thousands of years went past and the ancient beds of ice were covered over with sand and snow and fresh ice. The bodies of the frozen mammoths remained in a state of wonderful preservation. In some places the cliffs of fossil ice have remained until our own time, towering to a height of from 50 to 70 feet.

A number of frozen mammoths have been discovered on the New Siberian islands. Occasionally during a warm summer a huge block of ice is splintered and a mammoth's body is laid bare. The sailors and fishermen on the Siberian coast have for many years searched for frozen mammoths so as to obtain their great tusks of ivory and sell them to traders.

In 1799 a party of men in quest of mammoth ivory saw in a large block of ice on one of the New Siberian islands a big dark form which they suspected to be a mammoth. It was too deeply embedded to be reached, and the ancient ice was almost as hard as stone. They returned next summer and observed that a good deal of the ancient ice had melted. It was evident that the animal would in time be laid bare. When the third summer came round they could see through the ice the crouching form of the mammoth and one of its big curving tusks. It was not, however, until the fifth summer that the body of the ancient animal was released. The lower part of the ice had melted so much that the whole mass was split asunder owing to the weight of the monster. Then a part slipped away, as does an iceberg from an Arctic ice-

sheet, and, tumbling on to the beach, it broke open. The body of the big mammoth was thus laid bare.

It had been kept in "cold storage" for thousands of years, and the flesh was so well preserved that the men and their dogs devoured it freely. When they went away bears and other wild animals scented the carcass and came to feast on it, and the sea-birds gathered in large numbers to gorge on the flesh and fat.

In 1806 the carcass was found by English sailors and their discovery was made known to the Russian authorities. It was then decided to remove what was left of the ancient mammoth to a museum in St. Petersburg. The entire skeleton was intact, and large portions of the skin remained and were seen to be covered with a furry wool of reddish colour, interspersed with black hairs. The animal, which had been nearly twice the size of a modern elephant, was carefully stuffed and set up in the Royal museum in the crouching position in which it had been originally found.

In 1860 a Russian who hunted regularly for mammoth ivory discovered a frozen mammoth in a deep crevice of fossil ice which had long been covered over with sand, peat, and loam. The animal was in an upright position and in a fine state of preservation. Three years later there was a "rock slide" and the mammoth's body slipped from the crevice. It tumbled down to the beach, and unfortunately was carried away to sea.

A geologist who examined the site where this mammoth had been preserved for thousands of years, found that the ancient ice had first been covered with a layer of sand. Above this was a layer of peat; then came layers of loam and thin ice, and above these were the deposits of recent times. These

layers had for centuries and centuries prevented the sun's rays and heat from reaching the fossil ice and melting it.

The late Professor James Geikie tells that "even at the present day the drifted snows in south-east Russia are occasionally buried under sands and so persist for years". He notes, in illustration of this, that a Russian geologist once came across what appeared to be an ordinary sandhill, but "it proved to be a mass of congealed snow cloaked in sand about a foot in thickness". Immediately under the sand layer the snow was powdery, "but a little deeper it was firm and solid ice".

Occasionally heaps of bones of various kinds of ancient animals are found embedded in sandy loam, and it is possible these are the remains of the victims of prehistoric snow-storms. When a blizzard came on, the animals sought shelter in the lee of a hill. There they were buried and smothered in the snow, and afterwards the congealed snow was covered over with masses of drifting sand, or by stones and earth that slipped down the hillside.

Among the heaps of animal remains that have been dug out in different parts of Europe, it is found that beasts of prey and vegetation-feeding animals perished together. When faced by a common danger, such as a sudden and blinding snow-blizzard, the animals ceased to attack or flee from one another. They gathered together for mutual protection and warmth, the deer beside the lion, the wolf beside the wild ox, and together they perished from cold and starvation.

CHAPTER V

Types of Ice-Age Men

The tools of early man of the Stone Age have been arranged in three main classes. These are (1) the Eoliths ("dawn stones"), (2) the Palæoliths ("old stones"), and (3) the Neoliths ("new stones").

As we have seen, the Eoliths were shaped by the earliest hunters who made use of flint. These hunters lived from Pliocene times, the last stage of the Tertiary period, till the Chellean flints came into use. These Chellean tools are the earliest Palæoliths, and they have been named after Chelles, near Paris, where those first recognized were found. The Neoliths were invented after the climate of Europe became similar to what it is now—that is, at the beginning of the Modern Age.

In Chapter III we dealt with the types of human beings who were in Europe during the Second Interglacial period. They must have been forced to retreat southward when the Third Glacial period came on.

Once again the climate grew gradually colder, until Scandinavia was completely covered with ice. The heavy ice-sheet spread southward to northern Germany and across the North Sea area to Britain, but a greater part of England was left bare than during the Second Glacial period, for the ice-sheet did not come much farther south than Yorkshire; southern Wales and southern Ireland were also free of ice. In the river valleys of France and Spain the summers were comparatively mild, but the winters were cold—not cold enough,

apparently, to force human beings to live in caves. Perhaps the ancient men could resist the cold much better than we do.

Next came on the Third Inter-glacial period, in which so many human relics have been found that we obtain vivid glimpses of man's life and progress. The Palæoliths were shaped in large numbers. There were various types of these, but the chief was a massive tool which was held in the hand, and has been named the Chellean. The men who made use of this tool must have been brave and bold hunters.

The Chellean hand-axe (called by the French the *coup de poing*) was shaped somewhat like a pear, one end being thick so that it might be firmly gripped. The edge and point were carefully chipped so that it might serve the double purpose of a lance and an axe. With it the hunters could kill and cut up animals and also shape tools from wood and bone.

The later "hand axes" are found to be more carefully shaped than the earlier. They were made neater and the edge was extended. Other Chellean tools are called "choppers", "scrapers", &c. We can only make guesses as to what uses these tools served.

When the weather was growing colder because the Fourth Glacial stage was coming on, the working of flint improved greatly. The new industry was either developed by the men who had been living in western Europe for many centuries, or was introduced by hunters from some other area. New types of tools came into use and these are called the Acheulian, after St. Acheul in the Somme valley, France, where typical specimens were first identified. A keener edge was obtained by the deft secondary flaking of the flints. The edge was

rendered sharper by being carefully worked over again by pressure with a bone or wooden tool. "Hand axes" were made smaller and in different forms, as if to suit different purposes. Some of the tools were really "hand knives", others were "hand lances" with sharp points, and others were probably used for scraping and boring.

The Chellean and Acheulian tools have been found in



Chellean Type



Acheulian Type



Mousterian Type

Lower Palæolithic Implements

England chiefly in the valleys of the Thames and the Ouse and in the "Pinhole cave" at Cresswell Crags, Derbyshire, but not in Wales, Scotland, or Ireland. When Acheulian man was in England the commonest animals were the reindeer and the hairy mammoths.

The next class of Palæoliths is the Mousterian, named after Le Moustier in the valley of the River Vézère in France.

The Mousterian industry was a new one in Western Europe.

It was introduced towards the end of the Third Inter-glacial period and lasted all through the Fourth Glacial period, that is, for many thousands of years.

An interesting fact about the Mousterian tools is that they were shaped not from cores of flint but from the sharp flakes. A pointed blade, which was favoured, seems to have been attached to a wooden shaft, because the base is broad and carefully worked as if it were intended to fit close. Another tool appears to have been used to plane wood.

There is also an interesting type of Mousterian tool which has a point and is usually called a "borer". When a shaft was made smooth, the flint lance-head may have been fitted on by being tied with thongs drawn through holes made with this flint borer.

Tools of bone were also used. Some have marks made by pounding and rasping, and it is thought these were used as anvils on which to split up flint into flakes. The bones are chiefly those of the wild horse and the bison, and, no doubt, these were the animals that were chiefly hunted by the Mousterian people in certain areas.

Stone balls are sometimes found among the Mousterian relics. The smaller ones may have been thrown from slings and the larger ones may have been enclosed in hide bags, to which thongs were attached, and used to kill animals caught in pits or traps.

The Mousterian tools were not so finely made as the earlier Acheulian ones, nor were they so varied. There was a very special reason for this. Mousterian man differed very much from Piltdown man, who worked small flints, and from Chellean man, who gripped a flint axe in his hand. He belonged to a very powerful but clumsy-looking race. Although he had

big strong hands, they were not so nimble as those of the earlier peoples who inhabited western Europe and the area known as England.

If we were to catch a glimpse of a company of Mousterian hunters crossing the English Channel valley towards modern Kent, we should be inclined to smile at them. The men were small, the tallest being no more than 5 feet 5 inches in height, and the women were under 5 feet. They walked with a stoop, their big heads being thrust forward and their knees were always bent. They could not run or stand like a modern man. Their necks were so short and thick that when they looked sideways they turned not only their heads but also the upper parts of their bodies. They had very broad shoulders and their arms were short but very muscular. If we could have seen these hunters we should have noticed as they came closer that their faces were very ugly. Their foreheads were low and retreating and a bony ridge jutted out above their eyes, their noses were broad and coarse and their mouths very large, while their chins fell back towards their throats.

Their fingers were very short and broad, and they had such stiff thumbs that they could not be moved nimbly across and up and down the inside of the hand. Indeed, they could be bent as far backward as forward. When they gripped a small object they did so by pressing the thumb sideways against the first finger. They thus held a flint tool pretty much as we hold a pen, but with thumb and forefinger held straighter. As their fingers were strong, if not supple, they could use a scraper, a planer, or a borer quite freely, and they could grasp firmly, if in an awkward fashion, a stout shaft of a flint-headed lance.

Mousterian man is also called Neanderthal man. The

latter name has been given after Neanderthal, near Düsseldorf, in Germany, where a fairly complete skeleton of the human species was found in 1857. Another skeleton was afterwards found at La Chapelle-aux-Saints in France. Skulls of Neanderthal man which have been discovered are named after their localities and include the Spy skull No. 1, the Gibraltar skull, the Krapina skull, &c.

The Neanderthal people lived in Europe all through the Fourth Glacial period, when the Scandinavian ice-sheet once again extended gradually over a great part of northern Europe. The land sank and the North Sea plain disappeared and the sea poured into the English Channel valley. The country we know as England was then very much as is Spitzbergen at the present time, and in France, which had a climate resembling that of northern Siberia nowadays, there lived the reindeer and hairy mammoth. In Wales, Scotland, and Ireland the ice-fields were not so extensive as they had been in the Second and Third Glacial periods, but still the winters must have been very severe. In some areas the glaciers melted in the summer before reaching the sea.

The Mousterian hunters who came to the country we know as England reached as far north as Derbyshire. Some of their relics have been found in the "Pinhole cave" at Cresswell Crag. They must have crossed over from the country we know as France before the English Channel land-bridge was severed, or when, as a narrow channel, it was completely frozen over.

CHAPTER VI

Brave Hunters of Cave-Bears

The Neanderthal hunters who used Mousterian tools were cave-dwellers. Some scientists are of opinion, however, that when they first arrived in the country we now know as France, the climate was so genial that they were able to live in the open. In the Somme valley their stone tools have been found mingled with the bones of warmth-loving animals like the straight-tusked elephant, the hippopotamus, and the broad-nosed rhinoceros. Other scientists suggest that the bones and tools were carried down by floods from different sites belonging to different periods to the places in which they have been found. In the Thames valley, however, the plant-remains of a temperate climate are associated with some of the relics of Neanderthal man.

Before the hunters used them the caves were the lairs of ferocious wild animals such as the cave-lion, the cave-bear, and the cave-hyæna. In one French cave the bones of no fewer than eight hundred cave-bears have been discovered beneath the tools and weapons of the Neanderthal hunters.

Before making a cave their home, a Neanderthal family had first to clear it of wild beasts. As they made use of fire, they would be able to smoke out the monsters, and fires could afterwards be lit in front of the caves to prevent them returning during the night-time. It has been suggested that the hunters may occasionally have erected stone walls to narrow the entrances of caves, so that they might be better able to secure themselves against attacks by beasts of prey

attracted, as they may well have been, by the scent of meat stored within.

Modern artists have drawn imaginary pictures of battles waged by the Neanderthals against the gigantic cave-bears. They show these fierce animals snarling angrily at the hunters, who, perched on ledges of rock, throw or roll down big boulders to scare or kill them. Of late, however, fresh discoveries reveal the interesting fact that the ancient hunters were less afraid of the bears than used to be thought, and that they displayed cunning and intelligence in attacking them. The Neanderthals had, it appears, learned by experience that a powerful blow on a bear's muzzle either stunned it or caused instant death, and they made use of their knowledge with much daring and courage. Bears' flesh is quite good to eat. Modern hunters are known to roast "grizzly steaks" and eat them with relish. The Neanderthals not only attacked the cave-bears so as to get possession of their lairs, but also killed them for food.

A wonderful story of the experiences and customs of the ancient hunters has been unfolded of late by a party of Continental scientists. In the "Dragon's Cave" near Mixnitz in Austria the relics of the Neanderthals have been found mingled with the bones of cave-bears, and it has been shown that the men were more than a match for the wild animals.

For centuries it has been known that large quantities of big bones were lying in the cave mingled with dust and bat guano. The people in the neighbourhood used to believe that the bones were those of ancient dragons, unicorns, &c., about which curious "fairy stories" were told. Inside the cave may still be seen on rock faces the inscriptions made by visitors as far back as 1418. They had gone to the cave to

procure the wonderful bones, believing them to be those of fabulous monsters, so that they might use them for medicinal purposes. Ground "dragon-bones" were supposed to cure various diseases.

The cave is a large one. It opens in Rötelsstein mountain on the Mur river in Styria at a height of over 3000 feet above sea-level, and is about 700 yards in depth. Falls of rock from the roof took place during the Ice Age, dividing the cave into three sections. At a great depth—about 350 yards from the entrance—an earlier fall of rock left only a narrow passage to the dark innermost recess.

Bears are hibernating animals, and in Mousterian times the big cave-bears crept through the narrow passage to the end of the cave to sleep during the coldest months. They had to walk in single file, feeling their way in the darkness, between the blocks of fallen rock. The scientists, using their electric torches, have found that rock-faces have been worn smooth and polished by the furs of countless bears which for many centuries had been in the habit of passing up and down the narrow passage leading to the innermost recess.

At the mouth of this passage two ancient hearths were laid bare. These had been constructed and used by the Neanderthal hunters, who had selected suitable flat slabs of limestone for the purpose. The first hearth lay on the cave floor. It had been in use for a considerable time but ultimately became buried in debris. Apparently the cave was deserted for a period. Other hunters entered it in time, however, and they laid a new limestone fire-hearth above the old one.

The slabs were found to be strewn with dust, charcoal, and Mousterian tools and flakes. The implements were all of quartzite which had been carried into the cave from the

river valley. Evidently the Neanderthal hunters had been in the habit of chipping their stone tools as they squatted around the blazing cave fire which gave them light as well as warmth.

The bones of bears scattered on the hearths indicate that those animals were slain and eaten. Not only did the hunters cook the flesh, but they also roasted the bones and then broke them to procure the marrow. Further evidence of the ancient feasts was obtained when the explorers found in a side recess of the cave about thirty skulls of cave-bears lying side by side and hundreds of bears' bones and teeth. Some of the skulls bore marks of wounds that had healed before the animals were finally killed, and one had a wound which had suppurated for some time without healing. All the wounds were on the left sides of the skulls and had been caused by sharp instruments like the quartzite implements on the hearths.

The scientists were amazed to find that the big bears had been attacked in the depths of the cave by the fearless and cunning Neanderthal hunters. Traces of the ancient conflicts still survive. In the narrow passage leading to the innermost recess there is a great block of stone, and opposite it is a wall of soft rock on which there are many deep scratches made by the claws of the powerful animals as they struggled to escape.

When the bears came down the narrow passage from the innermost recess, the rock-face with the scratches was on their right and the great block of stone on their left. As has been stated, the wounds received by the bears were all on the left sides of their heads. The Neanderthal hunters stood on the block of stone and, as the bears came down the narrow

passage, they struck fierce and powerful blows at their muzzles either with sling-weapons or with quartzite axes attached with thongs to horn or wooden handles.

If a bear ducked its head, it was wounded on the skull and might escape, the wound healing later. Some of the bears reared themselves on their hind legs and scratched excitedly on the rock-face in their endeavours to find a way of escape. Probably some showed fight and mauled the hunters. The struggle was, however, one of brain against brute force. The Neanderthals not only used their weapons with skill and intelligence, striking at the bears' muzzles, as do modern Slovaks who hunt brown bears in the Carpathian Mountains, but they also made use of fire. Burning brands thrust at the rearing bears must have dazzled and scared them. One hunter may have carried the brands to give light to his companion who struck blows, and he probably used them against an animal which showed fight.

As the fire hearths were placed at the entrance of the narrow passage, it is possible that the hunters lit big fires to arouse the bears from the state of torpor in which they lay during the winter. The smoke probably forced the big animals to come out, gasping and half stupefied. Their human enemies probably terrified them greatly in that deep and dark cave.

The courageous Neanderthal hunters must have had exciting experiences. A snarling bear at bay is a dangerous enemy, and the bears which the Neanderthals attacked so boldly were very much larger than are modern bears. "When," says a writer, "a skull of the cave-bear is placed for comparison alongside one of the grizzly bear of the Rocky Mountains, the latter looks a perfect pigmy."

The ancient hunters who so boldly attacked the bears in the deep cave were ever in danger of being ripped by the claws of the monsters; a single blow from a bear's paw would cause a terrible wound, or, perhaps, instant death. No form of big-game hunting at the present day is more perilous than were those cave-bear hunting exploits of Neanderthal man.

The thirty skulls of bears found in this cave had been piled up there either by the hunters or by the action of water. One of the skulls was found, however, to have been securely fixed, with the aid of a leg bone, in a fissure of rock. This could not have been due to an accident. Apparently the skull and bone had been placed in position by human hands and for a very definite reason. It is possible, as has been suggested, that the ancient hunters observed some sort of ceremony with the skulls of the animals they had slain.

The Ainus of Japan,¹ who hunt bears, preserve and venerate the skulls of these animals. Other peoples are known to have observed a similar custom. Tacitus, the Roman historian, tells that the ancient Germans hung up on trees in their sacred groves the heads of certain animals. In England and Scotland the heads of stags, &c., are still preserved, but the custom has lost its ancient meaning. Heads of foxes, as well as horse-shoes, used to be nailed to stable doors to keep out witches; nowadays those who preserve an old horse-shoe say it is "lucky" to do so. A stag's head, placed on the head of a spear, was in former times carried with much ceremony into a church in Essex. Boars' heads were also used in ancient English ceremonies which had lost their original pagan meaning and were kept up simply as "customs". Many peoples in different parts of the world are known to show special

¹ An uncivilized tribe living under primitive conditions.

reverence for the heads of animals killed by hunters or sacrificed by priests.

The custom of preserving the skulls of animals is of very great antiquity. It appears to have been observed not only by the Neanderthal hunters, but by those who came immediately after them during the Post-glacial period.

CHAPTER VII

Ancient Natives of Galilee and London

Two important discoveries of human relics of Palæolithic times were made in 1925—one in a lonely ravine in Palestine and the other in the midst of populous London. The first was the fairly complete skull of "Galilee man" and the second portions of the skull of the so-called "Lady of Lloyds".

The discoverer of the "Galilee skull" was Mr. F. Turville-Petre. After finishing his studies in Oxford University, this young anthropologist went out to Palestine to take part in the organized work of exploring ancient sites which is conducted by the British School of Archæology in Jerusalem. He travelled north from the city of David and Solomon to the plain of Gennesaret, which skirts the western shore of the Lake of Galilee and is surrounded by barren hills, and there he began his search for antiquities.

Not far from the famous lake is a deep rocky ravine, the cliffs on one side of which rise to a height of about two hundred feet. Some two hundred yards from the entrance to the ravine is a big cave which the natives know as the

"Robbers' Cave", because it was formerly occupied by fierce brigands.

Mr. Turville-Petre decided to explore the ravine. The Robbers' Cave interested him very much, and when he entered it, he observed that the floor was covered with a thick deposit of hardened earth and debris. He decided to have the place explored for relics of ancient times.

At first a trench was dug so that an idea might be obtained as to what sort of relics the cave deposit contained. The workers, who were overlooked by Mr. Turville-Petre, had not dug down more than four feet when it was found that the relics were thousands of years old, and that they had never been disturbed. The cave had been occupied at intervals by human beings back to the time when metals were unknown and tools were made of stone and bone.

Under the four-foot level there was a layer of rock fragments which did not contain a single human relic. Severe winter frosts had in very ancient times split the roof and sides of the cave, the ice acting like wedges, and the portions of rock which had been dislodged fell down on all sides. A long cold period went past, during which no human beings lived in the cave.

Under the rock fragments was a layer of red earth which was about three feet thick. It had been formed by the dust which for many long centuries had been blown into the cave. In this layer were human relics in the form of tools of stone of the type which French archæologists have named Mousterian.

In Europe Mousterian tools belong chiefly to the Fourth Glacial epoch, and it has been proved that they were made and used by the Neanderthal race of hunters. Similar relics

had previously been discovered in Palestine, but none of them was associated with human bones, so that there was no direct evidence to show whether or not they were the handiwork of the Neanderthal peoples. In consequence, some scientists were inclined to doubt if Neanderthal man had ever lived in Asia.

When Mr. Turville-Petre reported to the British School of Archaeology in Jerusalem that he had made so interesting a discovery in the Robbers' Cave, it was decided that he should continue his work there. The cave deposits were then systematically cleared out and carefully examined.

In the red earth containing Mousterian tools were found the bones of various animals which had been hunted and eaten by men. Some of these animals have long been extinct. There were traces also of ancient fires on which the hunters had cooked flesh and roasted marrow-bones, and there were fragments of flint which had been chipped off the tools that the hunters made and used.

At the very bottom of the red earth layer portions of a human skull were discovered. When these were examined and fitted together it became apparent that, as Sir Arthur Keith has shown, the Mousterian tools in the Robbers' Cave had been shaped by Neanderthal men. The skull was that of a young adult of the Neanderthal race who had been buried in the cave by his friends.

This skull proves that the Neanderthal hunters had lived in Palestine as well as in western Europe. To distinguish this eastern or Asiatic branch of this ancient race, the skull is referred to as that of "Galilee man".

The "Lady of Lloyds" skull was found, as has been indicated, in the heart of London. It came to light when work-

men were engaged digging out the site for the new Royal Exchange which the Corporation of Lloyds have had erected in Leadenhall Street.

Deep down below the streets of London are ancient land surfaces which were laid out during the Glacial and Post-glacial epochs. The River Thames has not always flowed at its present level. In early Pleistocene times it was much higher, for the valley had not been scooped out. At a much later period the valley, which the river had shaped, was so deep that the bed of the Thames was far below the present street level. The river was then often a fiercely roaring torrent which carried down great quantities of mud and gravel, and it frequently overflowed its banks, flooding a considerable part of the valley. The mud and gravel were accumulated in such thick masses that the river bed was gradually raised, and the Thames ultimately became somewhat placid in its flow. Bones of animals which had perished in the valley were occasionally swept down by floods and embedded in the masses of mud and stone that now lie in compact masses below the buildings of modern London.

During the Ice Age the ancient river banks were covered with Arctic mosses and dwarf willows and birches. Animals which have long been extinct were then prowling about. These included the monstrous hairy mammoth beside which a modern elephant would seem a pigmy, the fierce woolly rhinoceros with two sharp horns protruding from its snout, the reindeer that scraped the snow in winter to find the mosses on which it fed, the big wild ox, &c. There were also human beings of an extinct type. Neanderthal men who made flint tools of Mousterian type hunted wild animals in the Thames valley, and, when the climate grew particularly severe, they

may have sought shelter in caves which have long been buried out of sight.

The excavation on the site of Lloyds' building were carried down to a depth of more than forty feet. In the "blue clay" below gravel was found the limb bone of the woolly rhinoceros. A number of animal remains were taken from the gravel, including part of a thigh bone and some molar teeth of the great hairy mammoth, the antlers and some limb bones of the red deer, and the skull of a wild ox.

Mr. Warren R. Dawson, the zoologist, was deeply interested in these finds and exhibited them at a meeting of the Zoological Society.

On visiting the site one day his attention was attracted by the most interesting discovery of all—some fragments of bone which had been found at a depth of about forty-two feet below the present street-level. These fragments had lain for thousands of years in a bed of river gravel of the lowest level in the Thames valley.

Mr. Dawson recognized that the fragments were those of a human skull, and noted that their mineralized condition indicated great antiquity. Having obtained permission to submit them to an expert anatomist and anthropologist, he carried them to Professor G. Elliot Smith of University College, London, and that scientist was able to show that the fragments had formed two-thirds of the skull of a left-handed woman between forty-five and fifty years of age.

The skull shows points of resemblance to one of the Neanderthal race. Unfortunately the forehead is missing, and it is unknown whether the eyebrow ridges were similar to those of the Neanderthals. It is not certain whether the skull is that of a Neanderthal of a later period than the

Continental Neanderthals, or of an intermediate type. If the skull is of the modern species, it is nearer the Neanderthal type than any other previously found.

With the exception of the Piltdown skull, that of the "Lady of Lloyds" is the oldest human skull yet found in Britain. Like the bones of the extinct animals from the site of Lloyds' building, the skull fragments were probably washed down by an ancient Thames flood from higher ground—perhaps from a cave in which ancient hunters had dwelt.

No other bones of this ancient woman were found, but Professor Elliot Smith was able to state that she had been left-handed. The skull of a right-handed person shows a particular development on the left side and that of a left-handed person on the right side of the skull. In the "Lady of Lloyds" skull the features of left-handedness are well marked.

The Galilee skull is now preserved in Jerusalem and that of the "Lady of Lloyds" in University College, London.

In 1925 a battered skull of Neanderthal type was found in a quarry near Weimar in Germany. It lay embedded among fragments of charred wood and bone, and some are of opinion it should therefore be regarded as evidence that some of the Neanderthal peoples were cannibals.

CHAPTER VIII

World-wide Traces of Early Hunters

It is in Europe that most of our information regarding the habits, customs, and industries of Neanderthal man have, so far, been obtained, the reason being that our continent

has been more thoroughly explored than the other continents.

Neanderthal man appears to have wandered and hunted from end to end of Europe. His tools and weapons of Mousterian type have been found in old river gravels, in rock shelters and in caves in Spain, in France, on the island of Jersey in the English Channel, in England (but not in Scotland or Ireland), in Italy, in Belgium, in Germany, in Austria, in Poland, and in southern Russia. By studying these relics closely, and taking note of the layers in which they have been discovered, it has been possible to arrange them into three periods which are referred to as Early, Middle, and Late Mousterian.

Our knowledge of the physical characters of the Neanderthal hunters is derived not only from skulls but from whole skeletons.

At Ferrassie, in the Dordogne valley, France, two skeletons of adults in a good state of preservation and two of children almost destroyed were brought to light between 1909 and 1911. One of the adults was a man, and as certain of his bones were missing, it has been suggested that the ancient hunter may have been killed and partly devoured by a beast of prey. The other adult was a woman, and her arms had been folded and laid upon her breast before she was buried in a crouched position.

The most complete skeleton of a Neanderthal man which has yet been discovered, lay in a small cave with a low roof at La Bouffia Bonneval, near La Chapelle-aux-Saints, Corrèze, in France. It was brought to light in 1908. The body was in a sleeping posture with the right arm stretched out, and beside it had been laid the horn and some large bones of a

bison. The earth above the skeleton contained a number of tools of the "middle" Mousterian period, and many of them had been broken as if on purpose. The custom of breaking the tools and weapons of a dead man is known to have been practised by several peoples in modern times, and a similar custom may, for all we know, have been observed by some of the Neanderthals. There were layers of cinders in the cave, showing that fires had been lit there, and there were bones of the woolly rhinoceros, the reindeer, the bison, the marmot, the horse, the wolf, &c. As the small cave is one which could not have been very suitable to live in, it has been suggested that the animal bones, as well as the tools, were offerings to the dead, and that flesh had been cooked on fires at different times in the belief that the dead man would partake of it. The custom of placing food in a grave was common in later times.

Although, however, Europe has yielded so much information about Neanderthal man, it is certain that he had his original home in some other part of the world. When he entered Europe his method of making stone tools had been well developed; he knew how to produce and use fire, and he had acquired great skill and experience as a tracker and hunter of wild animals.

The discovery of the Galilee skull proves, as has been indicated, that Neanderthal man was living in western Asia. It is known, too, that he was in Africa. In 1921 a Neanderthal skull was found in a cave at Broken Hill, in Rhodesia, which is situated about 650 miles north of Bulawayo. This relic is now known as the skull of "Rhodesian man".

The cave from which the skull was taken has been called the "Bone Cave", because it contains an immense quantity

of animal remains in a fossilized or partly fossilized condition. Among the animals represented in the finds are the hippopotamus, the rhinoceros, the elephant, the lion, the leopard, the antelope, &c., as well as numerous birds.

The skull of "Rhodesian man" is almost complete and has prominent eyebrow ridges and a retreating forehead. In outward appearance the African Neanderthal must have closely resembled the Neanderthals of Europe. Scientists have found, however, that the ancient Rhodesian had a more highly developed brain than is indicated by any Neanderthal skull yet discovered in our continent, and it is possible he was a more advanced and later type than the European representatives of the ancient race.

Near his skull were found some remains of another individual, or individuals, including a fragment of an upper jaw, a complete leg bone, parts of an arm bone, and some smaller bones.

No skulls or bones of members of the Neanderthal races have been discovered elsewhere in Africa, but Mousterian tools, which had been made and used by groups of Neanderthal hunters, have been collected in Egypt, on the Sahara Desert, and along the north African coast, chiefly in Algeria and Morocco.

It is possible that some of the Neanderthals entered Europe from Africa across a Mediterranean land-bridge. Italy was, during the period of their wanderings and at a later period, connected with Africa and also with Malta. The ancient hunters may have gone northward by way of Italy. Some think that those who reached the country now known as Morocco walked across a land-bridge at Gibraltar.

It was at Gibraltar that the first known Neanderthal skull

was found in 1848, the discoverer being Lieut. Flint of the Royal Artillery. It was placed in a local museum, but did not attract much attention until after another of similar type was found in 1857 in the limestone cave of Neanderthal (near Düsseldorf in Germany), which has given the modern name to the ancient race.

If there was a land-bridge at Gibraltar during the Third Inter-glacial and Early Fourth Glacial epochs, it must have been a restored one. The strait of Gibraltar was open at the close of the Pliocene Age, and the Balearic Isles, then forming one large group or two groups, had been separated from Spain.

The evidence that the strait of Gibraltar was open is provided by two types of marine molluscs which are still common in the cold waters of northern Europe. When the Ice Age came on, these molluscs spread southward to the Spanish coasts and then entered the Mediterranean at Gibraltar and reached as far eastward as Sicily and the southern coast of Italy, where they are now found completely fossilized. There must, therefore, have been a clear way for them from the Atlantic to the western part of the Mediterranean during a very cold period. Had there been a land-bridge at Gibraltar, these molluscs could never have reached the Italian coast.

The evidence that the Balearic Isles were separated from Spain from the close of the Pliocene Age is provided by the finds of the bones of animals which had been developed in isolation from the rest of Europe for thousands of years. One was about the size of a fox, with short stumpy legs, and it had horns. It fed upon plants and climbed the rocks. This peculiar animal is unknown elsewhere in Europe, except, perhaps, in Sardinia, where the remains of an animal of some-

what similar type have been discovered. There were gigantic tortoises on the Balearic group and these had undoubtedly survived from the Pliocene Age. The land-bridge that connected the island group with Spain must, therefore, have been broken before the Ice Age came on. If the land had risen during an Inter-glacial epoch and restored the land-bridge at Gibraltar, the Balearic island group should have been connected once again with Spain, but, apparently, this did not happen.

It seems highly probable that the Neanderthal hunters who reached Gibraltar did not cross over from Morocco but came southward through Spain.

While groups of Neanderthal hunters may have entered Europe across the Italian land-bridge from Africa, others may have entered it from Asia. As has been noted, Mousterian tools and weapons have been found in southern Russia. Some were in the "Wolf Cave" in the Crimea and others at a site in the province of Kuban in the Caucasus. Similar finds have been made in Asia Minor. Palestine, as we have seen, had its Neanderthal hunters. Near Eriwan in Transcaucasia some interesting Mousterian relics have come to light. For a good many years it has been known that hand-axes of quartzite of the Chellean and Acheulian types have been unearthed in India, but it is not known what species of humanity made and used them, for no skulls or skeletons have yet been found. Similar finds in Ceylon, Indo-China, and Japan may be noted.

Of late interesting discoveries of relics of the ancient hunters have been made in Central Asia and northern China. American archaeologists who visited the Gobi Desert in 1925 collected quantities of ancient flints, among which were certain pointed flakes and chipped side-scrapers said to be very similar to

those of the Mousterian industry in Europe. Others, however, were of later type.

More definite evidence was obtained by French archæologists who in 1923 found, at different places in the provinces of Ordos and Shensi, in northern China, Mousterian tools and fossilized animal bones. These relics were deeply buried under the yellow loess formations that were deposited during the last phase of the Ice Age.

Loess, it should be explained, is a fine sandy loam which was produced by the constant grinding of rocks by great masses of moving ice during the Glacial epochs. When the ice melted the loess was in places heaped up by the action of water and fresh-water shells are found in it. The greatest quantities were, however, blown through the air by strong winds and heaped against ridges of rock and along river banks. In Central Asia at the present day dust-storms are common, not only during the dry winter season but also in summer. This drifting of the sandy loam, which is still going on, has been in progress for many thousands of years, with the result that in some areas immense deposits of loess are to be found.

During the Second Inter-glacial, the Third Inter-glacial, and the Post-glacial epochs the loess left by the vanished glaciers was lifted and carried by winds to be distributed over vast areas in Europe and Asia. The broad river valleys of western and central Europe and south-eastern Russia have heavy deposits of wind-blown loess. In some places it lies in deep level beds; in others it bulks in the lee of mountain ranges like heavy snow-drifts.

The "yellow earth" of China and Mongolia is loess, and above it lies the black earth of later formation in which vege-

tation has long been flourishing. When rivers changed their beds owing to various causes, and cut through the loess, new valleys were formed, and some of these valleys are to-day flanked by steep cliffs of packed and hardened loess.

The French archæologists who were in 1923 exploring in northern China one day entered a ravine which had been cut out of loess, and saw at a depth of fifty feet in a loess cliff a layer of Palæolithic tools and a fire-hearth similar to the Mousterian hearths of western Europe. The tools were of quartzite and some were of Mousterian type, while among the animal bones were those of the woolly rhinoceros, the hyæna, the wild ox, the wild ass, the ostrich, &c.

At another site, about 150 miles farther east, the Frenchmen, while exploring a deep ravine, found in a loess cliff, about 180 feet below the level of the plain, some very small worked flints and the broken and fossilized bones of animals. There were complete skulls of the woolly rhinoceros and the bones of elephants, wild asses, gazelles, giant deer, cave-hyænas, &c. Parts of the antlers of deer, which were taken out of the same layer, seemed to have been used as tools or tool handles.

Fragments of ostrich eggs were also found. As some of the tools were older than others, it was believed that the relics of different periods had been mixed up in the loess, after having been tossed about by strong winds.

The third site was in an area in Shensi where the loess was in places about 500 feet in depth. In gravel below the loess were found some quartzite flakes which were of human workmanship. Evidently an ancient race of mankind lived in the country we now know as China before the yellow loess had been deposited.

In Europe, as in eastern Asia, the worked tools of human

beings have been found buried in loess along with the bones of extinct animals. These tools can, however, be classified, because similar tools lie undisturbed in their layers in the caves. Those found in China cannot, on the other hand, be similarly arranged in chronological order, because no cave evidence has yet been forthcoming to indicate the sequence of the various specimens.

America has yielded traces of early man. At Trenton in New Jersey, U.S.A., hand-axes and Mousterian tools have been detected in gravel of the Pleistocene Age in association with the remains of the hairy mammoth, the musk ox, the reindeer, and the mastodon type of elephant. Similar tools have been discovered in Indiana and Ohio.

In Florida further finds of like character were made in 1925. Mr. Harold J. Cook has announced that in undisturbed Pleistocene sand and gravel he found, at a depth of over five feet, three worked flints which lay beneath the fossilized bones of an extinct type of bison. "It is possible," he wrote (in *Science*, 20th Nov., 1925), "that the bison had been shot and carried these flint-points with him to the place where he finally died and was entombed." This find recalls an earlier one in Logan County, Kansas, where an arrow-head was found under a bone of an extinct species of bison.

In Florida, Professor Loomis recently discovered articles made by human beings lying below the bones of mammoths and mastodons.

Hand-axes and elephant bones have been taken from gravels in northern Mexico, and hand-axes, not, however, in association with bones of animals or human beings, were discovered some years ago in Brazil, Patagonia, and the Argentine, South America.

A number of ancient human skulls and bones, and some fairly complete skeletons, have been unearthed in North America from time to time, but it has not been proved that any of these are of the Pleistocene Age. Human remains found embedded in loess in the Argentine have been much discussed, and their age is uncertain.

Some hold that the fossil remains of South America and Lower California are those of a race different from the Red Indians of the present day. There are, however, several types of American Indians. No bones of Neanderthal man have yet been found in the Americas, and we must, therefore, leave the question of his presence in that part of the world an open one.

CHAPTER IX

Stories told by Cave Deposits

The cave-dwellers of Mousterian times were of very untidy habits. They never had "spring cleanings": indeed, they seem not to have done any sweeping at all. They left all sorts of rubbish lying about. When they ate their food, they cast the bones aside, and these became covered over with the dust which was often blown into the cave. If they chipped flint or quartzite or other stones to make tools or weapons, the fragments were left where they had fallen. When a fire was lit the charcoal of the last fire was thrust by hand or with a piece of wood to one side and became mixed up with other debris which was trampled under foot by the cave-men and women and children. In the course of time a great deal of

rubbish accumulated in this way in a cave and the floor-level consequently rose higher and higher, and became harder and harder. The deposits of the various families who lived in a cave from time to time have thus been preserved till our own day, and the scientists who dig through the deposits are able to tell us a great deal about the habits of the ancient untidy people. Sometimes they come across the skeletons of individuals who had died in a cave and were left lying under a heap of rubbish. In some cases shallow graves had been dug, and the mourners placed on the body some objects which were supposed to be required by their lost friend.

In some cases it has been found that after caves were deserted by hunters, wild animals used them as lairs. Cave-lions carried to the caves portions of the animals they had caught and devoured them there. When human beings again took possession of the cave, their own rubbish covered over the relics of the beasts of prey.

In most of the caves in which the Neanderthal hunters lived the bones found are chiefly those of the shoulders and haunches of animals killed in the chase. Ribs and portions of backbones are very rare. It would therefore appear that when the Neanderthals hunted in the open they did not carry or haul to their caves whole carcasses of animals, but that they took cuts from them. It is evident from the finds that a preference was shown for the long bones containing marrow.

It is probable that the ancient hunters often found it very necessary to make haste in cutting up the bodies of animals. Beasts of prey were numerous and would speedily scent a "kill". Neanderthal man was slow-footed, and he would be better able to get away in safety, carrying cuts of flesh,

if he left behind him a large part of an animal for the bears, lions, and hyænas. He might prove himself a match for a big bear in a dark cave, but it was a more difficult task to fight a bear in the open.

As the climate of Europe grew colder during the Fourth Glacial epoch, the Neanderthal families gradually moved southward. They were attracted to the Riviera, among other places, for there, sheltered from the north winds by a mountain range, the strip of Mediterranean coast-land was favoured with sunnier and milder weather than most of the districts farther north.

Near Mentone, on the borders of modern France and Italy, Neanderthal man found suitable caves. No fewer than nine of them pierce a great limestone cliff, and the largest has an entrance about twenty-three feet wide and it expands inside, rising to a height of about sixty-five feet.

For many long centuries the winds have been blowing great quantities of sand and dust into these caves, and from time to time there have been falls of rock from the roofs. In some of the caves the soil accumulated to a depth of about thirty feet.

The people living in Mentone and its neighbourhood used to take from these caves large quantities of the fine wind-sifted earth to lay in their gardens, and they often found ancient flint tools and the bones of animals. No attempt at systematic research was made, however, until 1870, when a French scientist began digging for relics in one of the caves. He was deeply interested to find the bones of a number of extinct animals, including those of the woolly rhinoceros, the wild ox, the cave-lion, the cave-bear, the cave-hyæna, &c. In other caves human skeletons were brought to light, and it

then became apparent that at Mentone a great deal of information regarding ancient times could be obtained.

The Prince of Monaco was so deeply interested in the early finds that he purchased two of the caves so that their contents might be carefully examined by skilled archæologists. Workers were then employed to clear out the soil, each layer being marked off carefully and its relics noted, so that the evidence of the different periods might be recorded in proper order.

In the upper layers of soil in the Prince's caves were found the bones of birds, &c., which are still to be seen in the Mentone district. Below these the scientists came across evidence of a cooler climate, the remains of animals being those of the types that nowadays live high up in the Alps and in the northern parts of Europe. When these animals lived at Mentone, the winters must have been very severe.

Farther down in the cave-soil lay the bones of extinct animals. Much interest was taken in the discovery of the skull of a huge cave-bear. When that animal hibernated in the Mentone caves the climate on the Riviera in the winter season must have been similar to that of northern Siberia at the present time. The summers were sunny but rather short.

One of the Mentone caves has been named *Grotte des Enfants* (cave of infants), because the skeletons of two very young children were taken from a layer of the soil, which yielded also the remains of Alpine plants and animals.

In the next layer the scientists found the skeleton of a woman. It was associated with the relics of a period when cold-loving animals roamed through pine forests in the neighbourhood of the caves.

Lower down in the soil were the bones of such animals as the woodland reindeer and the wild boar, and still lower down

were the smoke-blackened hearths of hunters who had lived for a period in the cave, and used flints of a type which has been called Aurignacian, after the town of Aurignac, near the Pyrenees, in France, where similar ancient tools have been found.

The layer below the hearth contained relics which showed that the climate was less severe than some of the upper layers gave evidence of. Among the animal bones were those of the wild horse, the ibex, the wolf, the fox, and the cave-lion. The beasts of prey had carried into the cave parts of their "kills" and devoured them there. A heap of stones resembling a cairn was found in the same layer. Evidently human beings had lived for a time in the cave, having cleared it of beasts of prey.

Below the cairn were remains of animals that lived among fir trees. The Mentone climate must then have been similar to that of Alaska in our own time.

Digging farther down, the explorers next found a layer which was composed chiefly of pieces of rock that had fallen from the roof of the cave. There were no traces of human beings or animals.

When these rocks were cleared out, it was found that before the cave roof began to crumble, the Mentone climate had been mild enough for such animals as the rabbit, the roe-deer, the fallow-deer, the stag, the ibex, wild cattle, and for the leopard and the fox. Smoke-blackened stones indicated that hunters sometimes lived in the cave during this period.

In the next layer was found the skeleton of a very tall man of the type now known as Cro-Magnon, which will be dealt with in the next chapter.

Below the grave of that hunter were the skeletons of a

woman and a lad with protruding jaws, and near them were flints and the bones of the wild horse, the ibex, and the hyæna.

Under these skeletons were traces of fires which had been lit by hunters, and lower down were flint tools of the Mousterian type which had been left behind by members of the Neanderthal race. These Mousterian relics lay above gravel which had been washed in by the sea. Below the gravel were the bones of cave-hyænas, the earliest-known inhabitants of the natural shelter.

The cave thus unfolded a very remarkable story of remote times. Neanderthal hunters had dwelt in it for a period and then vanished. Wild animals of an extinct type afterwards took possession of the cave, but were ejected by human beings who lit fires. These were hunters, but they were of a different race from the Neanderthals. They had bodies and heads like those of modern Europeans, but their jaws were not of European type.

After a time a taller and more vigorous race of human beings occupied the cave. They had long heads and short broad faces. When they arrived, the Fourth Glacial stage had already reached its height and was in process of passing away very slowly and very gradually.

In the next chapter we shall obtain glimpses of the period of transition during which the Neanderthal cave-dwellers disappeared and the new cave-dwellers became fairly numerous.

CHAPTER X

The Ancestors of Modern Man

When the Fourth Glacial stage was beginning to decline, there were in western Europe short warm summers but severe and long winters. Oak and chestnut trees were growing in sheltered valleys, but on the hill-sides were firs only. In some parts the country, as indicated, resembled Alaska and northern Siberia at the present time.

Reindeer and woolly mammoths were common in France, and there were large herds of wild horses and bison. Big stags were often seen in the summer season. Cave-lions, cave-bears, and woolly rhinoceri had grown somewhat rare.

Although the advance of the ice-sheet had been arrested and the glaciers were shrinking slowly, many centuries had to pass before the greater part of Europe could become suitable for mankind. Snow and ice lay on the mountains all summer, and the nights were cold. During the winter there were terrific storms.

Slow-footed Neanderthal man suffered greatly during the long Fourth Glacial period. When the climate began to change, and the animals he hunted migrated northward during summer, he was forced to follow them.

Probably the Neanderthal hunter often perished, like the animals he followed, far from his cave shelters. His numbers certainly declined and ultimately Neanderthal man vanished completely from western Europe.

New races were beginning to appear in southern and western Europe. These differed very much from the low-

browed, slow-footed Neanderthals and were of the species known as "Modern Man" (*Homo sapiens*.) They had high foreheads, long nimble legs, and erect bodies. Judging from their skeletons, it is evident that they could run fast—fast enough, indeed, to keep up with the animals they hunted. There are still Indians in Mexico who are so swift-footed and long-winded that they can follow the chase until the deer become exhausted. The skeletons of the early representatives of Modern Man have broad and deep chests, as well as the long shin bones of fast runners. Evidently they were fine athletes.

The earliest European types of Modern Man of the early Post-glacial stage are represented by two skeletons which have been found in the *Grotte des Enfants* near Mentone. Dr. Elliot Smith, who recently examined these skeletons, states that one is that of a woman about thirty years and the other of a boy of thirteen. He thinks that they resembled somewhat the modern Australian savages. It is customary to refer to the two skeletons as those of representatives of the "Grimaldi race".

A higher type of mankind arrived later. It is represented by a number of skeletons and is referred to nowadays as the "Cro-Magnon race". The Cro-Magnons were so like the people of modern Europe that if groups of them were to be restored to life to-day and were attired in modern clothing, they might walk through our streets without attracting special attention. We might, however, be struck by the fine physical development of some of the men and especially the tall Cro-Magnons. If they were to take part in the Olympic games, they would be among the record-breakers, especially in the Marathon race.

The Cro-Magnons were of two types, tall and short, but all had certain features in common. Their heads were large and long—larger than the average European head of to-day. Their foreheads were high, their noses narrow, and their chins well developed. Compared with the length of their skulls, their faces were short and they had high and broad cheek bones.

One male Cro-Magnon skeleton found in a cave near Mentone measured 6 feet 4½ inches, and other skeletons found in south-western France were those of men who were slightly under or slightly over 6 feet in height. The women were not so tall as the men, their stature varying from 5 feet 5 inches to 5 feet 7 inches.

The shorter Cro-Magnon type includes the small man, 5 feet 3 inches in height, represented by a skeleton found in a shelter at Combe-Capelle in the Dordogne valley in France. Some think that Combe-Capelle man resembled the Galley Hill man of an earlier period. It may be that the Cro-Magnons were related to the earlier hunters who were living in western Europe before the low-browed Neanderthals entered it.

We do not know for certain whether or not the Cro-Magnons came into touch with the low-browed, slow-footed Neanderthals. The languages of the two races would be quite different.

Some have suggested that the Cro-Magnons probably exterminated the Neanderthals in warfare. It is more likely that the latter died out, owing to the changing conditions of life. Possibly the last remaining groups of them perished of diseases brought into Europe by the Cro-Magnons, just as the natives of Tasmania, after white men settled on their island, died very quickly, being unable to resist diseases brought from

Europe. Similarly, after the Spaniards entered South America, many thousands of natives in the Amazon valley died from measles, which raged like a plague, because it was a new disease in that area and the natives did not know how to deal with it, and did not have in their blood the substance which resists the germs of measles.

Although the new race has been called Cro-Magnons, after the French village of that name, where skeletons have been found, the first Cro-Magnon skeleton was discovered in 1823 in "Goat's Hole", the name of a cave at Paviland near Rhossilly, Gower Peninsula, South Wales. This cave is situated on the face of a sandstone cliff over 30 feet above the present sea-level; it is about 60 feet long, 200 feet broad, and over 25 feet high.

At the time when the Paviland cave was occupied by the Cro-Magnon hunters it was on shore-level. In the cave has been found the skeleton of a Cro-Magnon who must have been buried when the climate of South Wales was so severe that the great hairy mammoth was living in the valleys. The tusks and skull of a mammoth were found in the cave near the human skeleton, which was that of a tall man.

All the bones of this Paviland skeleton were found to be red, the body, before burial, having been smeared with red earth. This was an ancient custom. The people who practised it probably believed that one was made stronger and more vigorous by having the skin painted red, the colour of blood.

It appears that the ancient people who smeared a dead man with a red mixture, believed that he would be revived by it in time and would awake and come forth from the cave.

The bodies of the Cro-Magnon dead were usually laid with

their faces towards the cave entrance. Amulets, which were supposed to give power to the dead, were also placed on different parts of the body. The Paviland man had a waist-belt of shells and a long necklace of little rods of ivory. Ivory rings, a small bone from the forepaw of a wolf, as well as an object shaped like a tongue, were also found beside the skeleton.

Five skeletons of the same race as the "Red Man of Paviland" (as he is called) were found in 1868 in a cave at the village of Cro-Magnon, near Les Eyzies in France. One skeleton was that of an old man; it is now referred to as the "Old Man of Cro-Magnon". Two skeletons were those of young men. Near them were fragments of a child's skeleton and the skeleton of a woman whose forehead had been injured by a heavy blow. The woman had a very large brain. In fact, it was larger than is the average male brain in Europe in our own day.

All the Cro-Magnons whose skulls have been found had large brains. As a scientist has said: "They required large brains because they had to discover much and invent much, being the pioneers of modern civilization."

When the Cro-Magnons entered the hunting-fields of western Europe they had to live strenuous lives. If animals on which they fed were numerous, so were the beasts of prey. They had better implements than were possessed by the Neanderthals, and these implements have been called "Aurignacian". Aurignacian tools include hand-knives (sharp on one side and blunt on the other so as to be grasped comfortably), scrapers, and finely-worked borers, hammer-stones, planing-tools, points, and gravers which were used by artists. They had also bone lance-heads and throwing-stones. Some of

the small flint tools with edges and points would have been useful in fishing.

The Aurignacian industry appears to have been introduced into western Europe across the Italian land-bridge from



Aurignacian
(Chatelperron point)



Solutrean (laurel-leaf point)



Magdalenian
("Parrot-beak" graving tool)

Upper Palaeolithic Implements

North Africa. It spread, on the one hand, over modern France and into the north of modern Spain, and, on the other, into modern Austria and the western parts of modern Germany. In modern England, Aurignacian tools were, until recently, found chiefly in the south-west. The cave known as Kent's

Hole near Torquay has yielded Aurignacian relics, as has also the Goat's Hole cave at Paviland already referred to. Of late, however, some Aurignacian tools have been discovered in the "Pinhole cave" at Cresswell Crags, Derbyshire.

The Cro-Magnons who hunted in England were not likely to have spread into the cold and barren tracts of the north. There were still glaciers in Cumberland and Scotland, and the severe winters would cause the animals of the chase to move towards the south. It is not likely that many of the Cro-Magnons lived in the country we know as England until the climate improved greatly. The early hunters of this race may have come only on hunting expeditions during the short summers.

CHAPTER XI

Cave Pictures of Ancient Times

Wonderful records of the life and times of Cro-Magnon man are to be found in great caves and rock shelters in France and Spain.

The ancient artists and sculptors made vivid studies of wild animals, and in some cases of the men who hunted them. They also depicted beasts of prey, fishes, and plants. Certain articles of horn, bone, and ivory, which were used in ceremonies or carried by men of rank, were decorated with forms of animals and with mysterious symbols.

The discovery that the Cro-Magnon people had a wonderful art was first made in the summer of 1879 by a Spanish nobleman and his daughter, a child of five. It chanced that

a fox had during a hunt taken refuge in a hole at Altamira near Santillana del Mar, in the north of Spain. Men set to work to dig it out and in doing so they discovered a cave. At the mouth of this cave lay some of the tools of the ancient hunters of prehistoric times.

The nobleman, the Marquis of Sautuola, afterwards entered the Altamira cave to search for prehistoric relics. While he was engaged in digging, his little girl lit a candle and walked into the depths of the cave. She had not gone far when she saw pictures on the roof and she called out: "Bulls! bulls!" Her father left his work and went to find what had attracted her attention, and he was greatly astonished to see a number of ancient paintings and engravings of animals.

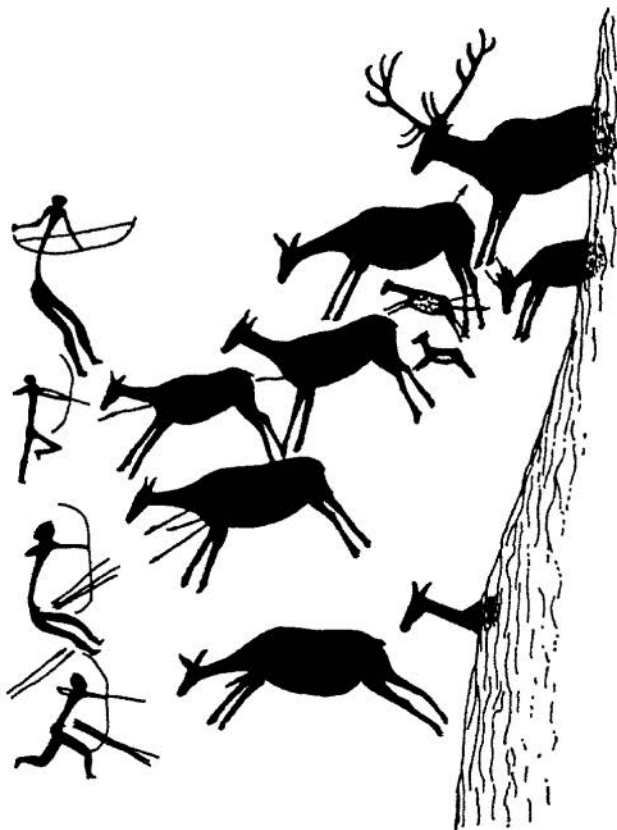
At the time few believed that these pictures were very ancient, but after some years had gone past, other discoveries of like character were made which aroused keen interest among scholars.

It chanced that the cave of La Mouthe in the Dordogne valley in south-western France was being cleared of the rubbish which had accumulated for thousands of years. In this rubbish were found relics of the Cro-Magnon hunters. During the digging operations an inner cave was discovered, and on its walls were paintings of animals. These paintings were evidently older than the relics found in the rubbish which blocked the entrance.

Other caves with paintings were subsequently cleared. In one case the figures of the animals were partly covered with stalactite which had taken many hundreds of years to form.

The surest proof of the great age of the pictures, however, is found in their subjects. Among the animals which had been depicted by the ancient hunters were the reindeer, the

hairy mammoth, and the woolly rhinoceros. The artist who drew and painted these animals must have been living when



The Deer Drive—a mural painting in dark red in the Cueva de los Caballos near Abucacer, Castellón, Spain

northern Europe was covered with ice, and the countries we now know as France and Spain had cold climates in winter.

Most of the caves in which the animal pictures have been found are very deep and dark. Those who nowadays enter them have to make their way with care by the light of candles or electric flash-lights. Some paintings are found at a distance of over half a mile from the entrance. In a narrow fissure of one cave there is a painting of a rhinoceros, which can only be seen by the aid of a mirror. Of late certain caves with ancient paintings have been fitted with electric lamps so that tourists may explore them and see the work of the ancient artists.

When the ancient artists themselves crept into the depths of the long, twisting caves they used lamps. Some of these lamps have been discovered. They are little shallow bowls with flat handles, which had been cut out of sandstone by workers who used small flint tools. On the bottom of one is a lovely engraving of the head and horns of an ibex.

The shallow basin of the ancient stone lamps was filled with animal fat in which was stuck a wick of dried moss. When the wick was lit, the flame was fed by the melting grease. Lamps of similar type are still used by peasants in the Dordogne valley in France, and they are not unlike the Highland cruises and the stone lamps used by the Eskimo peoples of the present day. It makes one wonder greatly to think that the lamps invented by Cro-Magnon man should have continued in use for many thousands of years.

The Cro-Magnon artists used bone palettes on which they mixed their colours, and specimens of these have been found; some were carved in animal shape. Probably the artists' brushes were made of hair, but not one has survived.

Colours were prepared by grinding small nodules of iron and manganese ores which give shades of red and yellow and

blue-black. Burned bones gave black pigment and Kaolin clay white pigment. The dry pigments were enclosed by the Cro-Magnons in hollow bones and were mixed with grease on the palettes.

When an artist entered the dark and deep inner recess of a cave to make a picture, he probably carried with him a sketch of the animal he meant to depict. Such a sketch could be made on a piece of slate, stone, or bone with charcoal or with a sharp flint. No doubt the artist had an assistant who attended to the lamp or lamps required to provide the necessary light. When the work was finished and the artist returned, the picture could not be seen except by those who crept into the dark and difficult "picture gallery", using lamps to light up the passages.

It seems clear, therefore, that the cave pictures were not meant to be freely seen and admired by all and sundry. Probably they were supposed to exercise a magical influence. By drawing the picture of an animal in a dark mysterious cave, the Cro-Magnons may have believed that they cast a spell over it, so that they might be able to slay it.

This curious belief is still to be met with among some superstitious peoples. French peasants who want to catch foxes make models of foxes in clay. In the Highlands clay and wax models of animals and men were made so that a magic spell might be cast over them. Some savage peoples make drawings of animals, believing that by so doing they themselves may find and kill a sufficient number of them for food.

When the writer was a boy he used to go bird-nesting with other boys. Those who wanted to collect specimens of wild-birds' eggs were in the habit of performing a curious ceremony.

Before they began to search for nests, they drew on a sandy bank the forms of as many eggs as they wanted to get, each boy repeating as he did so, "I want this and this and this." Apparently the boys were performing a magical ceremony which had come down from long past generations. They believed that they would be sure to find eggs after making drawings of them. There are still in the Highlands wells,



A Line of Animal Tracks which two Hunters are following

Painted in dark red. From Morella la Vella, Castellón, Spain. $\frac{1}{2}$ actual size

mounds, &c., at which, according to traditional belief, wishes are granted. The individual who "wishes a wish" at a "wishing well", a "wishing mound", or a "wishing gate" does so with closed eyes and in silence, and the wish is not revealed to anyone. Perhaps the deep caves were to Cro-Magnon man "wishing caves".

In some caves it is found that several animals have been drawn or painted on the same spot, one above the other. These different pictures were made at different periods. In

one cave, for instance, an early artist drew a hairy mammoth in outline. Then another artist came later and drew a bison



Cave-drawing from the Grotte de la Vache, Dordogne, France

Bison, Horses, Reindeer, and Bears, drawn at different periods one above the other.
(After Breuil.)

over part of the mammoth's figure. Some generations went past, and then an artist selected the same spot for his work and painted the figure of a wild horse over parts of the

mammoth and bison. If the figures had been drawn simply to ornament a cave, one artist would not have spoiled the work of another in this manner.

It is possible that some caves, and particular parts of the caves, were supposed to be specially sacred. That may be the reason why the drawings were sometimes mixed up. The hunters may have performed ceremonies in certain caves, believing that by so doing they would be successful in the chase.

When the mammoths were to be found in a particular area the hunters may have entered the dark part of the cave in which there was a mammoth picture. On seeing the picture in the light of the small lamps, we can imagine them saying over their wishes, as did the modern boys referred to above who were about to search for birds' eggs. Perhaps an old priest performed some ceremony to bring luck to the hunters.

The superimposing of one picture upon another may be explained through changes having occurred in the kinds of animals available for hunting. Thus, if in the course of time, the mammoth disappeared from a particular district, a bison figure would be drawn on the sacred spot in the cave because the hunters were accustomed to go out in search of that animal. Later on, the bison being scarce and horses hunted instead, having become numerous owing to the change of climate, the figure of a horse would be painted in the sacred part of the cave above the figure of the bison.

On the bodies of some animals in the caves arrows and lances were drawn as if to indicate that the hunters hoped to be able to slay the animal by wounding it in a vital part. On a figure of a mammoth in outline a big heart was painted. It looks as if in this case the artist believed his picture would

give the hunters power to slay the mammoth by casting a spell over its heart.

An interesting picture from one of the French caves is that of a man wearing the complete skin of a stag with the horns on his head, the ears erect, and the tail dangling behind. He is depicted as if he were prancing about in imitation of a deer. Perhaps this is a picture of a masked sorcerer performing some magical ceremony which was supposed to bring good luck to the hunters.

Another picture shows a group of nine women dancing in a ring round a male figure, possibly a priest. The ring games which children still play may be relics of ceremonies that were performed in long ages past. In ancient times the children would naturally imi-

tate the ceremonies which they saw performed by the grown-up people. After Christianity was introduced, Pagan ceremonies ceased, but the children kept playing the old



Rock Painting in red at the Cuevas de la Araña, Bicorp, Spain, representing a Gatherer of Wild Honey. Bees enlarged to indicate numbers. Actual size.

games. The Maypole dance, for instance, was long ago a Pagan religious ceremony, and nowadays it is merely a pretty game which has been kept alive by custom.

In certain of the caves in which the Cro-Magnon people lived, one can still see on the rock the impressions of human hands. Some of the ancient people who made these marks had smeared their hands with red earth mixed with grease before pressing them on the rock. Others laid their hands flat on the walls of the caves and smeared the colouring matter all round them and between the fingers. Perhaps this was another ceremony which was supposed to bring luck to the hands of hunters and workers.

These impressions of Cro-Magnon hands are specially interesting because they indicate that portions of fingers had in some cases been cut off. We do not know for certain whether or not such mutilations were due to accident or were done deliberately. The custom of chopping off the joints of fingers was practised until recently by some tribes of Red Indians in North America, by the dark tribes of Australian natives, and by the Bushman peoples of South Africa. There are references in Scottish Highland folk-stories to the custom. One reason for sacrificing a finger joint has been given by the Red Indians. They explained that when some particular disease broke out in a tribe or family, causing many deaths, the survivors believed they would be spared if they cut off one or more finger joints.

In the inner recesses of one of the French caves the floor is covered with clay, and at one point there is an impression of a human foot. A little hillock of clay has the marks left by human heels, as if a worker had been engaged in mixing the clay. There were also lumps of kneaded clay with finger-

marks on them. Near the hillock were found two clay models of bison, each about two feet long, which a Cro-Magnon artist had formed.

To reach this part of the cave the explorers had to break through a "fence" of stalactites. It had evidently not been visited since the Cro-Magnon clay-workers had left it. One or two flakes of flint had been dropped and also a pierced tooth of an ox. A stream deep enough to float a small boat runs out of this cave, and the walls of the cave are covered with engravings of animals.

The inner cave in which the clay models of bison were found is at the end of a narrow passage which was reached by a ladder. Apparently the inner cave was a sacred place which few visited in ancient times. It is wonderful to think that the very footprints of the last Cro-Magnons who entered it can still be seen.

The temperature of the inner cave never varies during the year, and that is why everything in it has been so well preserved.

The vast majority of the caves in which the Cro-Magnon artists worked are situated in southern France and north-western Spain. Engravings have, so far, been found in only one cave in Italy—that of Romanelli near Castro, Terra d'Otranto. In "Bacon's Hole" cave near Swansea, in South Wales, lines of red colour on rock are said to date back to the time of the Cro-Magnon hunters.

CHAPTER XII

Early Settlers in England and Scotland

At the close of the Palæolithic period the climate of Europe was gradually growing milder. The ice-cap in the north retreated farther and farther during the summer seasons and the melting ice caused great floods.

In the course of centuries the land rose as the ice vanished. When there were about 3000 feet of ice on Scotland and Denmark and about 6000 feet of ice over Norway and Sweden, the land had been depressed by the tremendous burden upon it. Then during the melting period the floods caused periodic deluges, forming lakes and marshes. In time, however, a great part of the North Sea land-bridge was restored, as was also the English Channel valley. Once again the Baltic became an inland lake, and men and animals could walk from modern France to modern England.

During the period of Magdalenian civilization (the final period of the Late Palæolithic Age), the climate of England was very cold. The hunters, however, although not numerous, were daring, and during the short summer seasons they followed the reindeer as far north as the area now known as Derbyshire. In the "Pinhole cave" at Cresswell Crags excavators found recently a finely carved lance point of Magdalenian type. It had been shaped from the tusk of a mammoth.

Some of the Cro-Magnon hunters may have crossed the land-bridge that connected the country we know as England with the continent. This land-bridge was, however, severed again during the Magdalenian period. There were, perhaps,

Cro-Magnons in the modern English area who continued in the Aurignacian stage of culture which had been slightly influenced by Solutrean culture.

In the "Pinhole cave" Aurignacian flint and bone tools have been found. The horse, bison, and reindeer were hunted,



Signs and Symbols of late Magdalenian Epoch in Spain

From petroglyphes in Andalusia (after Breuil).

but the reindeer were more numerous than the other wild animals.

The Cro-Magnon hunters who lived in the "Pinhole cave" lit fires. They left behind them a large number of pebbles which had been scorched and cracked by fire, and it is believed that they made use of heated pebbles to cook their food. Small pebbles could be dropped when hot into skin pots con-

taining flesh and water to cook the flesh by boiling and to make soup. Cuts of steak could be roasted between hot stones.

When the Magdalenian period was passing away, the climate in southern and western Europe improved greatly. The summers grew warmer and longer and forests gradually spread far and wide. Plains that had been bleak and barren were covered with vegetation, and the mosses on which reindeer fed disappeared. The reindeer and hairy mammoths gradually retreated towards the north. At the present day the reindeer in the north of Europe seek the hills in summer because in the valleys they are tortured by the insects when the weather grows warm.

As the glaciers melted in the country which we now know as Scotland, the reindeer became more numerous there. Horns of reindeer have been found in large numbers as far north as the Inchnadamph caves in Sutherland.

New races of mankind entered Europe as the climate grew milder. From North Africa a long-headed people of short stature entered Spain and Italy and gradually spread across France; broad-headed peoples also entered Europe from the east, some reaching as far west as modern Spain and Portugal.

These new races brought with them new industries. From North Africa groups of immigrants carried small flints which are called "pigmy flints" or "microliths", some being fish-spear heads and others apparently the "teeth" of wooden harpoons also used for catching fish.

This flint industry was developed in North Africa, as had been the earlier Aurignacian industry which was carried into western Europe by Cro-Magnon man.

In France the pigmy flint industry is called the Tarden-

oisian, after the finds made at the type station of Fère-en-Tardenois, Aisne, France.

The people who shaped and used these small flints appear to have lived to a great extent on fish and shell-fish. In Portugal their deposits contain quantities of the shells of whelks, oysters, cockles, &c., as well as the bones of wild cattle, deer, sheep, goats, pigs, hares, &c.

The Tardenoisian people have left traces of their activities round the shores of the Mediterranean, from Algiers to Egypt on the south, in Palestine on the east, in Spain and France on the west, and in the British Isles as far north as Scotland. Some Tardenoisian flints have been found in the Crimea and some as far distant as India.

The other industry is known as the Azilian, which has been so named after the typical finds made near the town of Mas d'Azil at the French foot of the Pyrenees. Azilian relics have been unearthed in the north of Spain, in parts of France, in Belgium, and in England and Scotland and in Bavaria. The people who introduced the industry may have come into Europe from the east. They made and used horn harpoons similar to those used in Magdalenian times. The Magdalenian harpoons, however, were made chiefly from reindeer horn, while the Azilian harpoons were always made from red-deer horn. In France the Azilian and Tardenoisian cultures were mixed, and archæologists refer to the late phases of both as Tardenoisian-Azilian.

In the cave of Ofnet in Bavaria, evidence has been found that when the Azilian and Tardenoisian industries were practised in that area, there were mixed groups of long-headed and broad-headed peoples.

Over thirty human skulls were found in the Azilian layer

in the Ofnet cave. When these were examined by experts it was found that they had been cut off the bodies after death. The heads were placed together in the cave facing the west, and the cave opens from the south-west.

Apparently the people of this period believed that the soul was in the head, and that after death it went towards the west, as the sun appears to do each day. Snail-shells and the teeth of stags had been placed on the skulls of women and children, but four men's skulls had none of these amulets on them. The skulls and teeth were apparently supposed to bring luck to the dead as well as to the living.

In Spain and Portugal the Tardenoisian people did not cut off the heads of their dead. Most of the skeletons found in these countries, however, have been those of women and children. It looks, therefore, as if large numbers of the men perished when out hunting. Perhaps many were killed and devoured by beasts of prey.

The art of the Tardenoisian and Azilian peoples differed from that of the Cro-Magnons. On rock shelters and the walls of caves they painted rude figures of animals and curious designs, some of which may have been symbols and some alphabetic characters. The so-called "Azilian" painted pebbles have of late been declared to be "fakes".

A third people entered Europe in the north-eastern area, perhaps from Asia, and spread round the shores of the Baltic while it was yet an inland lake. These are known as the Maglemosians, and some think they were the ancestors of the tall fair northerners (the Nordics). The climate on the Baltic shores had become mild enough to permit of forests growing. The chief tree was the pine, but there were also aspens, hazels, birches, and elms.

Relics of this northern people have been found in the peat moor of Maglemose (Great Moor) near Mullerup on the west coast of Zealand. They appear to have had their homes on rafts on a fresh-water lake at Maglemose, and the relics found in the peat probably dropped from these rafts.

Like the Azilians, the Maglemosians had harpoons, mostly of bone, but chiefly with barbs on one side only. Like the



Azilian. Harpoon from MacArthur Cave, Oban



Tardenoisian ("Pigmy" Flints)



Maglemosian or Azilian-Maglemosian
(Harpoon from rock-shelter, Druinivargie, Oban.)

Tardenoisians they used pigmy flints. The bone needle with the "eye" was in use among the Maglemosians of the Baltic, but no such needle has been found among the Azilian relics of France and Spain.

Drawings of animals in outline and curious designs, which may have been symbols, were engraved on many of the Maglemosian bone and horn tools.

An examination of the animal remains shows that the

Maglemose people hunted the moose, the red-deer, the roe-deer, the wild ox, and the wild pig, and occasionally killed bears and beavers.

Of very special interest is the fact that they had the domesticated dog. No trace of the dog has been found among the Azilian relics. It may be that the Maglemose people were the first settlers in Europe who used the dog to hunt wild animals and warn them of the approach of beasts of prey. It is possible that they had their houses on rafts so as to be safe from these wild animals, especially during the long, dark nights of winter.

Relics of the Azilian period have been found in the Mac-Arthur cave at Oban, which is situated about thirty feet above the present sea-level. It was formerly on the seashore, but it was elevated during the last land movement when Scotland was rising and the south of England was sinking.

During the period when the cave was on the seashore there was still a land-bridge across the English Channel, and another across the North Sea in the area of the Dogger Bank.

In the cave were found tools made of bone and deer horn, twenty flakes or chips of flint, and three "hammer stones". Among the tools were deer-horn harpoons with barbs on both sides. The flints were, like the harpoons, of Azilian type.

The bones of the domesticated dog were found in the Oban cave. It would therefore seem that the Oban cave-dwellers had been in touch with the Maglemosians, who, as we have seen, had domesticated dogs.

Other relics of the same period were found not far from the cave, and at the base of a steep rock called Druimvargie (pronounced drum-var'a-gee, the "g" being hard). There the harpoons were of bone with barbs on one side only, a form very rare in France. These bone harpoons are of Magle-

mosian type. Other harpoons were found on the island of Oronsay in the southern Hebrides and on a smaller island near it, and in Kirkcudbright. Two harpoons of Maglemosian type, with barbs on one side, were found under peat near Hull in Yorkshire, one at Hornsea, and one at Skipsea.

It would appear from these finds that the people of Maglemose had come over the North Sea land-bridge into the area now known as Yorkshire. As there were broad rivers and marshes to cross, they may have walked over the ice during the winter season.

A reindeer horn harpoon has been found in the Victoria cave near Settle in Yorkshire, and near it were painted pebbles and other relics of the Azilian people. Perhaps the people who occupied the cave when the reindeer lived in Yorkshire were mixed Azilians and Cro-Magnons of the late Magdalenian period.

Some flints found at Campbeltown in Argyllshire have a Magdalenian appearance, and these may be relics of Cro-Magnon settlers in western Scotland who arrived about the same period as the Oban Azilian-Maglemosian peoples.

To sum up, it would appear that when the last traces of the Ice Age were passing away in northern and north-western England and in hilly Scotland, hunters and fishermen from the Baltic area and from modern France were settling in this country, and that among them were Cro-Magnons. Those who came across the North Sea land-bridge were probably fair and those from France were probably dark. Among the latter may have been tall Cro-Magnons with high cheek-bones. The skulls found in the MacArthur Cave, Oban, are of a type still found among the modern population in Scotland. Tall individuals with high cheek-bones are not uncommon in

Scotland and in some parts of England even in our own day.

No relics of the Azilian or Maglemosian peoples have been found in Ireland.

CHAPTER XIII

The Discovery of Agriculture

A new era was ushered in when the early people became agriculturists. As hunters and fishermen they were merely "food gatherers". They gathered such food as could be obtained—the animals they slew and the fish they caught. The number of persons who could reside in any one district was limited by the amount of food that could be gathered. Only from one to sixteen could live in a square mile. The surplus population had to migrate to new areas in search of wild animals.

When, however, cereals like barley, millet, and wheat were cultivated, the people became "food producers" as well as "food gatherers". They were able to store up a new kind of food that did not perish quickly like flesh and fish; larger numbers could then make their homes in one district without fear of starvation. Permanent villages came into existence, and the small farmers began to keep and feed domesticated animals, a thing wandering hunters could not do.

The discovery of agriculture was a most important event in the history of mankind. With that discovery, indeed, begins the story of modern civilization. The farmers had to have laws to protect individuals and their possessions. These

laws had to be enforced. The leader of a community became the ruler and the judge.

It was necessary that the small farmers should till the land and sow seeds at the proper season. This meant that time had to be measured. The calendar was therefore introduced, and the calendar we are using to-day was invented in its earliest form by the pioneer farmers.

As we have seen, a number of inventions were carried into Europe from North Africa during the Hunting period. It was from that area that the Aurignacian industry came. The Solutrean industry entered Europe from the east and may have come from Asia, but the later Magdalenian industry was developed from the Aurignacian industry. The Tardenoisian industry came from North Africa, like the earlier Aurignacian.

When a large part of Europe was under ice and the reindeer lived in France, the climate in North Africa was milder and more moist than is the case at the present time. Grass and trees flourished in the Sahara, a large part of Egypt was a lake, and there were forests and grass-lands between Egypt and the Red Sea.

Evidence that early man also lived on the shores of the Egyptian lake has been found on the cliffs above the Valley of Kings' Tombs near Luxor. Their worked flints may still be picked up in large numbers. Some scientists are of opinion that groups of hunters were living in this area as far back as the First Glacial period in Europe.

When the Egyptian lake was being gradually drained by the Nile after it began to flow in increasing volume towards the sea, large quantities of rocks and gravel were deposited beneath the cliffs. Worked flints were carried down by the

waters, and some of these have been found on the old river terraces.

For a long period the River Nile flowed at a much higher level than it does at present. Its bed became deeper and deeper in time. Marshes were then formed along the river banks, and in the mud carried down by the floods trees and other plants grew.

In time the hunters came down from the cliffs and began to dwell in the fertile valley. Like the European hunters, they engraved pictures of animals on the rocks.

During the Fourth Glacial period of Europe, the River Nile, having almost worn out its present bed, was laying down larger and larger quantities of mud along its banks. Year by year and century by century the mud left grew thicker and thicker. In some places the dried mud is now from fifty to sixty feet deep.

The Egyptian hunters dwelt on the river side when the mud banks began to form, and traces of them are found deep down in the "alluvial floor". Borings which have been made near Cairo and elsewhere have led to the discovery of fragments of the pottery made by the early people.

These very ancient Egyptians buried their dead in cemeteries on the outer edge of the mud. The graves were dug in the warm dry sand. In time, however, the mud was pushed out over the sand, covering the ancient cemeteries, which now lie under cultivated land.

Part of an ancient cemetery was discovered some years ago in Naga-ed-dêr in Upper Egypt. It was found that the bodies which had been laid in the warm dry sand had been naturally mummified and so well preserved that the contents of the stomachs could be examined. Among these contents

were husks of barley and millet and fragments of fish and animal bones. There can be no doubt, therefore, that these early Egyptians were agriculturists as well as hunters and fishermen.

The barley and millet, as experts have found, were native to Egypt. They were cultivated wild grasses which had been growing for thousands of years in the valley of the Nile.

The seeds of wild grasses are not very plump as a rule, but when cultivated by man, they increase in bulk.

In Egypt the barley and millet grasses were first cultivated, however, by the River Nile, which, in some respects, is the most wonderful river in the world. Each year it rises and floods a great part of the valley. Then it gradually retreats, leaving lakes and pools that form natural irrigation channels. It happens that the flood retreats just at the beginning of the cool season. Barley and millet wild grasses then shoot up in the damp soil and they grow ripe at the beginning of the hot season, when the seeds fall and are buried in the dry soil, where they remain until the river floods again and causes them to sprout.

For many centuries the River Nile had been cultivating barley and millet in this way, so that their seeds became plump enough to attract the attention of man to their value as food.

In time the first farmer began to assist the river by clearing the sand-choked irrigation channels and by forming new channels. The barley then grew in larger quantities, and the farmer and his friends, having learned a useful lesson, began to form little fields and store the water in pools so as to keep the crops irrigated. The Nile thus taught the Egyptians how to become agriculturists. At the beginning the small farmers were really the "pupils" of the Nile.

The new mode of life which was introduced when farming began made the dwellers in the Nile valley take a great interest in nature. The Nile measured the year for them. They came to know that when the river flood retreated the time had arrived to sow seeds. They also observed that when the crops were ripe, the hot season had begun. They subdivided the year into three seasons—the season of inundation, the cool season, and the hot season.

Each season was divided into four months—that is, into moon periods. A month began with the appearance of the “new moon” and ended with the last phase of the “old moon”. It had three weeks, each being ten days in length. The twelve months of thirty days made up a year of 360 days. It was found, however, that the year was longer than this, and five extra days were added to each year. These were observed as festival days.

After the calendar had been in use for some centuries, it was discovered by the scholars of the time that the sun, as well as the Nile, measured the year. The solar calendar was then invented. This calendar was long afterwards introduced into Europe. It has been readjusted once or twice. It is really, however, the old Egyptian calendar that we are still using.

The dwellers in the Nile valley who introduced agriculture were of the Mediterranean race—dark-eyed and dark-haired people of medium stature and with long heads. This race had spread along the North African coast and entered Europe at the close of the Magdalenian period, and they met and mingled there with broad-headed people of medium size from Asia. These mingled peoples are known as the carriers of the Tardenoisian and Azilian tools and weapons. The long-headed people were for a considerable period in the majority.

Before agriculture could be introduced into Europe the seeds of cultivated barley, millet, and wheat had first to be obtained. Some think that the earliest supplies of these seeds were carried into southern Europe across the Italian land-bridge. After the land sank, and that "bridge" was severed by the sea, the seeds that reached Europe were carried by way of Palestine, Syria, and Asia Minor, and then across the Dardanelles, or directly across the Mediterranean in the boats of the earliest mariners.

The seeds would have been of little use unless those who brought them into Europe had formed colonies and begun to farm waste land. They had to bring with them agricultural implements as well as seeds, and the hunters who became farmers had to be instructed how to till the soil, sow the seeds, protect the fields against wild animals, and reap the crops when they were ripe.

When the crops were harvested, the colonists had to instruct the natives how to grind the cereals so as to make cakes and porridge. The cereals were also cooked and eaten whole.

The farming colonists who came from North Africa must also have introduced the laws they were accustomed to. Their villages were no doubt governed in the same way as were those they had come from.

The natural conditions in Europe are, however, different from those in North Africa. The new farms were made fertile by rain, instead of by a flooding river like the Nile. In time, the habits and methods of the European farmers had to be adapted to suit the new localities in which they had settled. New problems had to be solved in Europe, and in solving them the new communities made progress on local lines. Progress

was thus forced upon them by necessity, and it was fostered by experience in the course of time.

It must be borne in mind, however, that progress began in the first place after the new agricultural mode of life was introduced into Europe. The farmers could not make a beginning until they had obtained the seeds and were instructed how to work small farms. Nor could those who obtained the seed from seafarers have obtained them at all unless boats had first been invented.

The invention of boats is dealt with in the next chapter.

CHAPTER XIV

The Invention of Boats

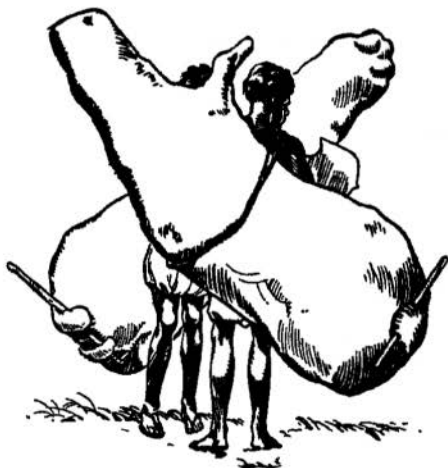
The discovery of how to use and produce fire, the discovery of how to work flint, and the discovery of agriculture mark important stages in the history of early man. When the boat was invented another great advance in civilization was made possible. From the first real boat was ultimately developed the sea-going ship.

At the outset we must distinguish between floats and boats. Some peoples crossed rivers and lakes by using rafts or by making skin floats. In central Asia, in our own time, natives sew up the skins of large animals, make them airtight, and inflate them. They sit on the top of these inflated skins and paddle them across a deep river.

Rafts were formed from logs of wood at an early period. In Mesopotamia the rafts were made more buoyant by tying skin-floats all round them.

The very ancient Egyptians made cigar-shaped floats by tying together bundles of reeds. Two bundles were then tied side by side, forming "double floats", which were called "The Binding". Some Egyptian peasants still make and use these double floats.

It was from the reed-float that the Egyptians in ancient times made the first boat.



Deris (Inflated Skins) out of the Water

The earliest known specimen of an Egyptian boat is to be seen engraved on the cliffs at el-Kab in the Nile valley. It was drawn by one of those ancient artists who carved the figures of wild animals on rock as did the Cro-Magnon hunters in Europe. This boat resembles very closely the simple river vessels which were depicted at a much later period in the tombs of the Egyptian aristocrats.

In one tomb picture three workmen are seen making a

river boat by binding the reeds together with ropes. This type of boat was also called "The Binding" because it was bound in the same way as were the double floats.

Somebody had discovered how a single reed float could be used with safety. He had apparently been studying fishes and birds, for the fore part of the vessel has a fish shape and the stern rises like the hinder part of a swimming bird.

As the inventor of the boat made use of reeds, he was able to make experiments without much trouble. He had to discover the particular shape a boat required to be so that it might float by itself and bear the weight of a man without tilting over. When he had solved the problem of balance, it was possible to make larger and heavier boats of wood.

It used to be thought that wooden boats came first. Some believed that men made their earliest boats, which are called "dug-outs", from the trunks of trees.

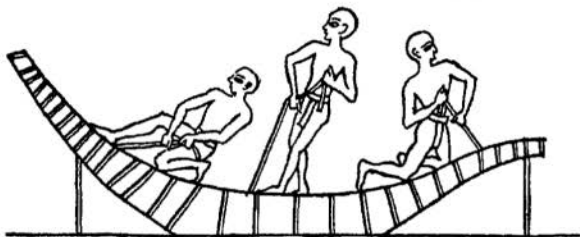
The specimens of boats of this kind which have been discovered are not, however, nearly so old as the reed boats of Egypt.

It has been suggested that the early people began to think about boats when they saw fallen trees carried down rivers; that a bold adventurer got on to a floating tree and sat upon it, and then found that it was possible to cross and travel down rivers by using the trunks of trees. In time, according to this theory, some man hollowed out a seat for himself on the tree trunk. He found that he could paddle with greater ease when he had done so. This led to the whole trunk being hollowed out and the first boat being invented.

The way to test this theory is to attempt to stand or sit on a floating trunk of a tree. If one tries to do such a thing, one must expect a wetting, for the tree is apt to roll round. It

takes some practice to use a tree as a float. Before it can be safely depended upon it must be shaped so that it may lie steadily in the water when any weight is placed upon it. In other words, it must be given a boat shape, broad in the middle and tapering at one end.

It is unlikely that the inventor of the first boat experimented with trees when he was trying to discover what shape a boat should be so that it might have perfect balance on the water. Tree after tree would have to be shaped with small



Egyptian "Binding"

tools of stone, and a man might spend his whole life-time working very hard and yet never discover the proper dimensions of a boat.

A very reasonable view is that early man never saw a boat in a tree until after a boat of light material had first been invented.

In Egypt there can be no doubt that the reed boat called "The Binding" comes first. The boat-builders in that country discovered the proportions and shape that a boat should have by experimenting with reeds. Then they shaped hollow reed boats and made them watertight by covering them with pitch.

It was a boat of this type which the mother of Moses made when the Pharaoh of Egypt commanded that every Hebrew boy should be drowned in the Nile as soon as he was born. The boat is referred to in the Bible as an "ark". It is told that the mother of Moses hid her baby for three months. "And when she could no longer hide him, she took for him an ark of bulrushes (reeds), and daubed it with slime and with pitch, and put the child therein; and she laid it in the flags by the river's brink." (*Exodus*, ii, 3.)

After the Egyptians had been using reed boats for a long period, they began to make wooden boats. These wooden boats imitated the shapes and proportions of reed boats.

Egypt was in ancient as in modern times an almost treeless country. Such trees as grew there were not suitable for making dug-out canoes. The Egyptians, however, were able to make heavier boats than those shaped of reeds by using a number of planks of wood and fixing them together with wooden pins. It may be that they also used skins which were sewn over a framework of wood.

In time the Egyptian boat-builders made boats which could be used with safety on the seas, as they had been for long on the River Nile. Then the seafarers sailed round the coast to Palestine and Syria and discovered the forests of Lebanon.

Trees were cut down on the Syrian coast and bound together as rafts, and these were drifted down to the Nile. After wood was thus imported into Egypt, the boat-builders made "dug-outs" in imitation of the earlier reed boats. Later on they made boats by cutting long planks from the trees, but that kind of work was not possible until metal saws had been invented. Small planks were, however, got by splitting

the trees with wedges and dressing the planks with flint adzes.

Before heavy vessels were turned out in the Egyptian ship-building yards, the mast and sail were introduced. The earliest masts, as is shown by pottery pictures, were not very high, and the sails appear to have been screens of dried reeds.

A tall single mast could not have been easily fixed up in a reed boat, and if it were not made fast securely a gust of wind would blow it down.

The earliest long masts, as is found in the tomb pictures, were double or tripod, and attached to the bulwarks. They were kept from being blown overboard by ropes, backstays and forestays. When boats were decked, single masts became common. These were usually lowered when not in use.

The ancient mariners who ventured on the Mediterranean began in time to make long voyages. They followed the coasts as a rule, but there were some who did not fear to lose sight of land and were guided by the birds that migrate across the sea. In time the mariners made night voyages, steering with the aid of the stars.

At an early period daring seafarers from the Mediterranean made voyages round the coasts of the countries we now know as Spain, Portugal, and France. Some crossed to the great island that was ultimately called Britain. Once this sea-route had been opened, voyages were made so as to procure supplies of things that were required, including tin, copper, lead, and even gold.

About seventeen ancient boats were discovered in Glasgow and its neighbourhood during the latter part of the eighteenth century and the early part of the nineteenth century. Some were lying at more than twenty feet above the present sea-level. One was sticking in sand below a Glasgow street at an

angle of forty-five degrees. Another was lying upside down as if it had capsized. It had been built of oaken planks which were fastened by pins of oak to the ribs. The bow was carved and the stern was of triangular shape. Another boat built of planks was found near it. The rest of the boats were dug-outs which had been shaped from the trunks of oak trees. Some had been dressed as smoothly as the Polynesian canoes which are shaped with stone adzes.

In one of these Glasgow boats was found a beautifully polished axe or adze of greenstone. Another boat had a plug of cork, and must therefore have come from an area where cork trees grow—that is, from Spain or from southern France, or from Italy.

A big dug-out was found at Brigg in Lincolnshire in 1886 while workmen were digging on the site of a new gasometer. It had been shaped from the trunk of an oak tree, and was 48 feet 6 inches long, nearly 6 feet wide, and 2 feet 9 inches deep. The bottom of this boat is flat and the bow rounded.

Another dug-out was found in 1883 near the River Atun in Sussex. It is 35 feet long, 4 feet broad, and 2 feet deep. A third boat found at Rother in Kent is 63 feet long and 5 feet broad. In York museum there is a "dug out" which is about 25 feet in length.

These and other dug-outs appear to have all been shaped by workmen who used stone adzes.

The Glasgow boats, which lay fully twenty feet above the present sea-level, cannot be dated with certainty. They must have reached the Clyde, however, during the period when the last land movement was taking place, that is, when Scotland was gradually rising and the land in the south of England was gradually sinking.

Some scientists think that this land movement began about 3000 B.C. Before that date the Egyptian sailors had reached Crete and Cyprus, where colonies were established. There were also colonies of seafarers on the coasts of Palestine, Syria, Asia Minor, Greece, and Italy. From some of these settlements seafarers went to southern Spain, where copper and silver were found. It may be that the seafarers who reached the Clyde had set out from an ancient port of Spain.

Some early boats were, as stated, made of skins which were stretched on a frame of wickerwork. These were excellent boats of their kind for rough seas. Boats of this kind continued in use round our coasts until comparatively recently.

The skins were tanned and sewn in two or three layers, and, after being stretched over the wickerwork, were covered with pitch. We still speak of the "seams" and the "skin" of a boat. Some of the old skin boats had decks and half-decks and masts for sails.

Boats were built and used at a very early period on the Red Sea as well as on the Mediterranean. The mariners coasted round Arabia and reached the Persian Gulf, and, in time, round to India and beyond.

A very interesting fact about the ancient boats is that they had eyes painted or carved on their prows. Eyes are still painted on some Maltese boats and on fishing-boats in the Outer Hebrides, as well as on native boats in India, Ceylon, China, &c.

Experts in boat-building are of opinion that the boat was invented in one particular area, and most of them think that area was Egypt. They hold that the Egyptian boat was gradually introduced all over the world, just as in our own day has been the railway engine, which was invented in England.

CHAPTER XV

The Prehistoric Egyptians

During the Fourth Glacial and the Post-glacial epochs the early hunters who lived in Egypt had a less severe struggle for existence than had the cave-dwellers in Europe. The climate of the Nile valley was genial and large tracts which are now desert wastes were habitable. Game was plentiful and there was an abundance of fish in the Nile.

The evidence of the great antiquity of human activities in Egypt is of a peculiarly interesting kind. As stated in Chapter XIII, flint tools have been found in large numbers on the ancient river terraces in the valley, which were occupied by the hunters' camps when the Nile flowed at a very much higher level than it does in our day. Occasionally these worked flints were washed down the "wadis" (ancient water-courses) by floods and deposited on the river banks. They were deeply embedded in masses of mud and "rock rubbish", and in the course of ages these masses were hardened by cementing material into conglomerate rock, for which a popular name is "pudding stone". Out of the conglomerate, which in some areas covers thousands of square yards, one can nowadays, using a hammer and chisel, chip out worked flints similar to those found on the upper terraces. As conglomerate takes thousands of years to form, one thus gets a good idea of the great age of the early Egyptian flint tools.

On rock faces in the Nile valley and even out on the desert one occasionally finds incised drawings which were made with pointed flint "gravers". Professor Breasted was once

informed by a native of Abu Simbel that there was an ancient temple in the northern Nubian desert. This man led the American scientist far out into the sandy wastes lying to the west of the Nile, and it was found that what had been called an ancient temple was a natural rock formation pierced by an arched "doorway" which had been scooped out by the action of water in very ancient times. There were, however, traces of early man at this interesting site. On the rock were carved "two boats, two giraffes, two ostriches, and a number of smaller animals". Professor Breasted reminds us that "the giraffe has been extinct in Egypt from very remote times", and he adds that "it is possible the hunters of the Pleistocene Age have left these records in the Sahara". When the giraffes were wandering about in that area which is now a sandy desolation, there must have been vegetation to provide them with the food they required as well as water to drink. It is also of importance to note that boats had been invented before the giraffes disappeared from the Nile valley and its neighbourhood.

Reference has already been made to the drawing of an ancient Egyptian boat on the cliffs at el-Kab in the Nile valley. The antiquity of this and other rock pictures is proved by the fact that they are covered with what has been called "desert varnish", which is of a dark brown colour. This rock polish has been caused either by the action of moisture and heat throughout long ages or by wind-blown dust which has adhered to the surface of the cliffs. The polishing or "varnishing" of the darkened rocks has been a very slow and gradual process. This is shown by the state of the inscriptions cut on the rocks about 5000 years ago, for these bear little trace of the "desert varnish". The rock pictures of the ancient hunt-

ing peoples of the Nile valley must be some hundreds of years older than the early inscriptions referred to. Thus "desert varnish" provides us with evidence of the great age of the Egyptian rock drawings, as does the stalagmite which covers some of the Cro-Magnon cave pictures in western Europe.

During the Fourth Glacial epoch the River Nile was laying down the soil which was ultimately to be cultivated by the inhabitants of Egypt. As excavations and borings through the alluvium have shown that pottery is to be found in the deepest layers, it is evident that when the hunters descended from the ancient terraces they began to make clay vessels to serve as cooking-pots, water-pots, and bowls.

Nature may have suggested to the early Egyptians how to make clay pots, as it suggested to him how to cultivate barley. The river brings down clay and the hot sun bakes it hard. Lumps of baked clay could be used to build houses. The hunters may have thus been accustomed to use "natural bricks" before they imitated nature by manufacturing bricks in suitable shapes. Occasionally whirling water will scoop out holes in lumps of clay, and when these lumps are sun-baked they can be used to carry water. Once the early inventor observed that clay could be used to make useful vessels, the craft of the potter was introduced.

After agriculture was introduced the population of Egypt increased greatly. Hunting and fishing were still continued, but the people were not wholly dependent on animals and fish for food. An era of progress then set in. It became possible for the inhabitants of Egypt to advance on new lines, not because they had more brain power than the Cro-Magnon hunters of Europe, or because they were more vigorous, but chiefly because they lived in an area where nature was an

instructor and the climate was genial. Once they began to grow corn, they no longer lived, as did hunting peoples, on the edge of starvation. They had more leisure in which to make experiments and to discover things. Withal, they were forced by sheer necessity to solve some problems. The River Nile had to be crossed, and boats were required and had to be invented. Their country was a narrow one—just a strip of land on either side of the Nile, the desert sands having wiped out all vegetation which formerly grew on the Sahara and the area between the Nile and the Red Sea.

The domestication of animals came later than the introduction of agriculture. It is possible that the first step in this direction was taken when the farmers



Egyptian Domesticated Dog with Collar

It was domesticated in Egypt at end of the Quaternary Period and in Europe later.

found it necessary to protect their fields against the ravages of cows, boars, asses, &c. They did not erect fences, but appear to have caught many animals by driving them into enclosures. An ancient relief found in the pyramid temple of Sahure, and dating back to the middle of the twenty-eighth century B.C., shows a hunting enclosure full of wild animals, many of which had been wounded.

Nothing tames animals like hunger. The wild deer of the Scottish Highlands become so tame during the winter season that they are "hand-fed" by gamekeepers. No doubt, many

of the animals caught by the Egyptians similarly ceased to fear man when hungry, and accepted food readily in an enclosure. Their young could be reared in captivity and would be quite tame.

From old reliefs we find that cows, asses, horned sheep, and goats were kept by the Egyptians and that they had also domesticated geese and ducks. All these animals were native to North Africa. The cattle were of the long-horned type and are known to have lived in a wild state in northern Egypt and westward along the North African coast to the country we now know as Algiers. The theory that the earliest domesticated animals in Egypt came from Asia is not favoured by those who realize how difficult it would have been to drive flocks and herds across the waterless desert of Sinai. Cattle, sheep, and goats would have perished in a few days on the hot, sandy wastes.

In time, as agriculture was developed, the Egyptians trained the oxen to draw the plough, which was, to begin with, formed like the ordinary wooden hoes used to break up the ground. Asses were trained to carry burdens. Cows and goats were milked and their flesh was eaten.

Much information regarding the customs and industries of the inhabitants of Egypt is found in the ancient graves. It was believed that the dead required food, and it was customary to place a number of pottery vessels beside them. In the oldest known graves half a dozen jars and bowls were laid beside the dead, who were placed in a crouching position with the arms bent and the hands in front of the face. The body was wrapped in the skin of an animal, or in linen, or covered with a reed mat. Occasionally the body was protected by a big clay vessel placed with the rim downwards, or a clay coffin

was provided. Some graves were lined with brick or wood, but most of them were just sand pits.

Among the articles placed in the graves for the use of the dead were tools and weapons, and also the ornaments which were worn by the living as amulets. The habit of using face paint for magical purposes, and to protect the eyes from the glare of the sun by making a dark line under them, was common in very early times. In some graves the archaeologists have found palettes of slate on which malachite (a green ore of copper) was ground with the aid of a small pebble so as to provide a pigment for eyelid paint.

There are no inscriptions of the early period under review, and the story of progress has to be pieced together by studying the articles discovered in the graves. It is found that the Egyptians became very skilled as artisans. Their hand-made pottery was given graceful shapes. When a pot was baked on a fire and placed rim downwards, the part which was sunk in the charcoal became black. This "black top" pottery, as it is called, remained in use for a long period. As it was found that pure clay is apt to crack when baked on a fire, the potters learned, in time, to introduce limestone or quartz so as to prevent cracking. After a long period it was discovered that a glassy paste could be prepared by fusing sand, soda, and a metallic oxide, and the pots were then glazed. The Egyptians were the inventors of glazed pottery.

As workers of flint, the Egyptians surpassed all ancient peoples. Their flint knives with ripple-flakes were not only of beautiful shape but were given sharp edges by means of minute and delicate flaking. Handles of ivory, wood, and bone were used. Some of the knives had handles of gold, and these may have been used for religious purposes.

All the information that has been gleaned regarding the ancient Egyptians of the early period comes from the Nile valley. The Delta region has so far yielded no traces of the activities of the pioneer agriculturists, or any graves. Owing to the vast quantities of mud deposited by the Nile branches in that area, the relics of early man which may have survived lie at a great depth. It was, however, in Lower Egypt that the calendar was introduced and the river boatmen first ventured on the Mediterranean. The Lower Egyptians must therefore have made great progress in civilization, and been at least as far advanced as the inhabitants of Middle and Upper Egypt during the early period under review.

Egyptian history begins with the conquest of Lower Egypt by the united peoples of Middle and Upper Egypt and the founding of the first dynasty by King Menes. The long period prior to this conquest is called the "pre-dynastic period".

During the latter part of the pre-dynastic period Egypt was divided into small states. These then became grouped into two rival kingdoms—that of Upper Egypt and that of Lower Egypt.

When, after the conquest, a single pharaoh ruled over all Egypt, the united kingdom became rich and powerful. The pharaoh was regarded as a god and the masses of the people revered him and served him.

During the early dynastic period the great pyramids of Egypt were erected. The work entailed could never have been carried out if the people had not been disciplined to obey the commands of their rulers as a religious duty.

The largest of the pyramids, situated near Cairo, are the greatest piles of stone masonry ever erected by man.

Shortly before 3000 B.C. the first grave of hewn stones was

constructed for a pharaoh. In the course of a century rapid progress was made in working stone, and the first pyramid was erected at Sakkara as a tomb for a pharaoh who was named Zoser. During the next four hundred years a large number of pyramids were built.

Egypt was the country of the earliest stone-masons, and the first country in which the people were united under the rule of great autocratic kings whose word was law. Thousands of labourers and artisans devoted their lives to the work of providing vast tombs for their rulers, and artists and sculptors were trained and employed to provide pictures and statues for tombs and temples. Great progress was made in the arts and crafts, because the people were thoroughly organized and disciplined to serve their rulers.

The progress achieved was made possible by the situation of Egypt. It was protected on the east and west by barren deserts and on the north by the Mediterranean Sea. Invaders from Asia had to cross the almost waterless desert of Sinai, and could be held in check with comparative ease so long as a pharaoh remained powerful and had a strong army at his command.

Nature, which had taught so much to the Egyptians, thus afforded them protection against rivals and plunderers, and their civilization developed rapidly on local lines. As the population increased, larger and larger areas of desert had to be irrigated and cultivated so as to provide an abundance of food. It was because the harvests were so plenteous that the pharaoh and his nobles could command the labour of large numbers of subjects and provide food for them.

Egypt required much from other countries, and especially wood and metals. The supplies were not, however, imported

by Egyptian merchants. The pharaohs sent expeditions to Sinai to work the copper-mines, and they sent fleets of ships to the Syrian coast to obtain the cedar of Lebanon. For many centuries the Government controlled the trade of Egypt, exporting and importing large quantities of goods. When foreign traders crossed the Mediterranean, or came from Asia across the desert of Sinai, it was not with private traders but with the Government officials that they conducted business.

The progress achieved in Egypt may be said to have been due in large measure to the intelligent control of the most autocratic Government the world has ever seen.

CHAPTER XVI

The Sumerians of Mesopotamia

The second great centre of old-world civilization was the valley of the Tigris and Euphrates in Lower Mesopotamia. This country was anciently known as Babylonia and Chaldea, and in our own time is called Iraq.

Like Egypt, this valley is of river origin. The plain was gradually formed in the course of long ages by the mud carried down by the rivers Tigris and Euphrates. During the Fourth Glacial epoch, when the Nile was beginning to deposit mud along its sandy banks, the Persian Gulf reached far inland to the vicinity of the modern city of Baghdad. We do not know at what rate the valley was formed by river mud. The land rose after the passing of the last phase of the Ice Age, and for a time the "filling up" process may have been rapid. We

know, however, that since the time of Alexander the Great, who died about 2250 years ago, the sea has been pushed back by river deposits and accumulations of drifting sand a distance of nearly fifty miles.

Eridu, the most ancient city in Lower Mesopotamia, is now a heap of ruins situated about 125 miles from the head of the Persian Gulf. Originally, as its name indicates, it was a "sea-port". Excavations have revealed that when it was first built it stood on a limestone ridge on the shore of an inland lake which was connected with the Gulf by a river branch. The traditions associated with it point to its having been founded by seafarers who introduced a civilization which had origin elsewhere.

We do not know definitely who those seafarers were. They appear to have been related to the early settlers in Elam in south-western Persia who worked flint and obsidian, made use of copper, and manufactured pottery. The oldest finds at Susa have been discovered at a great depth, but it is difficult to make an estimate of the rate of accumulation at this site as compared with other sites because everywhere there were local variations. Dust-storms must be taken into account, and these did not have the same results at various periods at one place or in different places. Similarly, water-laid deposits varied from time to time in one particular area and in other areas.

As in Egypt, there were at an early period in Lower Mesopotamia and in other parts of western Asia, representatives of the long-headed, short-statured men of the Mediterranean race. These appear to have been the pioneer settlers. Like the pre-dynastic Egyptians, the earliest settlers in Susa manufactured finely-woven linen. Their pottery is so fine, however,

that archæologists believe they possessed the potter's wheel, which was not known in Egypt until early dynastic times.

From some area in the north a people whom we know as the Sumerians migrated into Lower Mesopotamia and Elam, and absorbed the earlier people. Their skulls were of mixed type, indicating that they were a "blend" of broad-heads and long-heads. The earliest known portraits of this people show that they had prominent noses, and that they had eyebrows sloping towards the outer corners of their eyes as have many northern European peoples at the present day. They shaved their faces and heads, and they wore woollen kilts, their shoulders being bare. The gowns of their women were suspended from the left shoulder.

Lower Mesopotamia is referred to in the Bible as "Shinar". This is the Hebrew rendering of the name we know as "Sumer" (pronounced *shoo'mer*). It is customary nowadays to refer to the ancient people of Sumer as the Sumerians.

The Sumerians spoke an agglutinative language as do the Basques of western Europe in our own time. We do not know whether or not an agglutinative language was spoken in Lower Egypt in pre-dynastic times, or in Crete before Greek times. The dynastic language of Egypt was not an agglutinative one, but appears to have had relations with the Semitic group of languages.

The Sumerians adopted the agricultural mode of life which had been introduced into Lower Mesopotamia, and they practised the irrigation system which the Nile had taught to the early agriculturists in Egypt. Barley, wheat, and millet were grown, and fruit-yielding trees were cultivated.

Stone was used for building in Eridu, and suitable stone was found there. Elsewhere in the Lower Mesopotamian

plain bricks were manufactured for building houses and temples.

At an early period a Semitic people, who did not shave their heads and faces, settled in the northern part of the Lower Mesopotamian plain. We know them as the Akkadians—the people of Akkad. In historic times the plain below Baghdad was known as “the land of Sumer and Akkad”.

In prehistoric times the Sumerians and Akkadians built small cities of brick houses, and these, with the agricultural areas adjoining them, were independent states. As the country was more open to attack by invaders than was Egypt, the Sumerians had often to engage in war and they became efficient warriors. The closely-formed battalion of spearmen, known as the phalanx, had its origin in Sumeria.

Not only did the Sumerians engage in warfare against intruders, but they fought among themselves. One city state attacked another and conquered it. Groups of city states were from time to time formed by conquerors, and rival groups struggled for supreme power.

Pictorial art did not make such progress in Sumer and Akkad as it did in Egypt. The Sumerians, however, were an enterprising people and became industrious craftsmen and traders. They had to go long distances to procure wood, stone for statues, &c., and metals, and they founded colonies in northern Mesopotamia and in Asia Minor. Sumerian civilization spread from the colonies over wide areas and influenced the Semitic and other peoples.

A system of pictorial writing was introduced in Sumeria at a very early period. The Egyptians had similarly, to begin with, a system of picture signs which was developed into alphabetic signs. In the separated countries the process

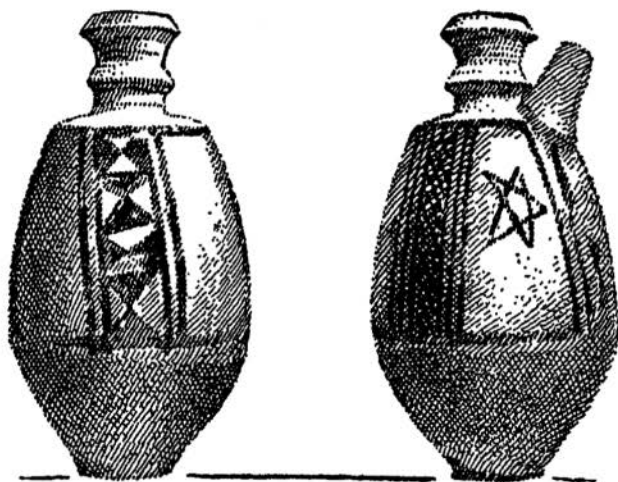
of writing, however, followed different lines. The Egyptians manufactured from the papyrus reed a parchment (the earliest paper) on which they traced alphabetic characters with a pen. In Sumer clay tablets were used, and the signs, developed from pictures, were made by pressing a wedge-shaped stilus on the soft clay. This system of writing is called "cuneiform", from the Latin word *cuneus*, a wedge. The people of Crete also used clay tablets for their records, and the later scholars of Rome wrote on wax tablets. Modern paper is remotely of Egyptian origin, as is also the modern pen. The Chinese system of writing betrays the influence of ancient Sumeria.

Once the system of writing was introduced in the ancient world, there were local developments in various areas. The Greek and Roman alphabets were late developments of systems which had been improved and simplified by merchants and scholars in the course of the ages.

There are indications that pre-dynastic Egypt and Sumeria were brought into touch. The peoples of both countries visited Lebanon for timber, and they appear to have met there and to have met also on the shores of the Red Sea and perhaps in Arabia. The mace heads of the two peoples were similar, and the cylinder seal, which was used by Sumerian merchants, was introduced into Egypt. There are withal resemblances between certain burial customs and between some art objects and symbols and there are links in religion. Both peoples, as has been indicated, had a similar system of agriculture, and both had domesticated animals.

Some hold that the Egyptians were the originators of agriculture and copper-working, while others hold that they were indebted to the people of Mesopotamia for the main

elements of civilization. The problem is a difficult one, but the fact cannot be overlooked that there was continuous development in Egypt from the remote Age when the Nile began to deposit soil in the valley. The Egyptians cultivated barley and millet native to Egypt and domesticated North African animals.



Sumerian Painted Jar of about 3500 B.C., discovered containing Wheat by Professor Stephen Langdon in Mesopotamia

Reproduced by permission of Professor Stephen Langdon.

In Egypt the Nile floods retreat at the beginning of the cool season, and this was favourable for the natural cultivation of barley, as has been shown. In Mesopotamia, on the other hand, the flooding of the rivers Tigris and Euphrates takes place at the beginning of the hot season and was not favourable for the cultivation of barley. The system of irrigation practised in Mesopotamia had been developed elsewhere, and

the first thing necessary to make it suit local needs was to erect banks to keep back the floods, so that the channels might be formed and protected. It used to be thought that the wheat cultivated by the Sumerians was the wild wheat of Mesopotamia and Palestine. It has been proved of late, however, this wild wheat sheds from its ear each grain as it is ripened. A grain of this kind could not be harvested. When crossed with other wheats, it is rendered sterile. Modern wheat is not therefore a cultivated variety of wild Mesopotamian or wild Palestinian wheat. The claim made that Egypt was the home of early agriculture appears to be well founded.

It was not in Egypt, however, that wheat was naturally cultivated as was barley. Professor Cherry suggests that the early seafarers discovered it in the *Ægean* island of Delos. The Egyptians and Sumerians had the same name for wheat. Once agriculture was discovered experiments were made with various cereals, vegetables, &c., in different areas.

Civilization began with the agricultural mode of life, but it does not follow that the people who were the first farmers discovered all the things which caused civilization to advance in early times. Important inventions were made by individuals in different areas into which agriculture had been introduced, and when different communities were brought into contact in districts visited by their seafarers and overland expeditions, discoveries, inventions, and ideas were, no doubt, interchanged. At this time of day it is difficult to tell whether a particular object common to the Sumerians and Egyptians was invented in Egypt or in Mesopotamia. A useful article was in ancient as in modern times quickly adopted, no matter in what area it had origin.

In Egypt and Mesopotamia the arts and crafts of civilization were flourishing long before agriculture was introduced into western Europe, and while the peoples in that area were still hunters and fishermen thinly scattered over wide districts.

The chapters that follow tell how civilization reached and spread through Europe.

CHAPTER XVII

How Civilization reached Europe

One of the most interesting stories of the ancient world has been pieced together of recent years with the aid of the wonderful discoveries made in the *Ægean* area—that is, in Crete, in southern Greece, at Troy, at the mouth of the Dardanelles, and on the islands known as the Cyclades, which are sprinkled over the *Ægean* Sea between the Greek mainland and the western coast of Asia Minor. It was in this area that the basis of modern European civilization was laid. Long before the civilization of Greece came into existence—before the people we know as the Greeks had entered the land which they were to make so famous—the *Ægean* area was peopled by agriculturists and seafarers who were enterprising and progressive. They built cities which were “hives of industry”, they set out on voyages of exploration towards the lands of the western Mediterranean area, and they sailed up the Dardanelles to explore the regions round the Black Sea.

It was from the *Ægean* area that a great part of Europe received the new civilization which enticed the hunting tribes to settle down in organized communities to till the land, to

engage in trade, and build boats with which to visit other countries.

The chief centre of *Ægean* civilization was the island of Crete. For long ages it had been uninhabited because the Palæolithic hunters were unable to reach it. After boats were invented, however, groups of seafarers arrived on the island, and some built small round huts of wattles and clay with floors of stone, while others erected rectangular houses of undressed stone. They engaged in hunting and fishing. Among the remains of the food they ate have been found the bones of cattle, sheep, pigs, and hares, and also sea-shells. As they had domesticated animals, they must have come from areas into which agriculture had been introduced, for the early farmers were the first to tame wild animals.

The pioneers in Crete appear to have practised agriculture but not to any great extent. They had no grinding-mills and may have cooked their barley whole, and as they had no sickles, they may have plucked the grain out of the ground instead of cutting it.

Perhaps the manners and customs of the early Cretans resembled those of the people of the isolated island of St. Kilda, which was visited by the Scottish traveller, M. Martin, in the seventeenth century. Martin tells that the St. Kildans of his time not only caught fish and sea-birds for food but had little farms. "They sow very thick," he wrote, "and have a proportionable growth; they pluck all their bear (barley) by the roots in handfuls, both for the sake of their houses, which they thatch with it, and their cows which they take in during the winter. . . . The barley is the largest produced in all the western isles; they use no plough but a kind of crooked spade; their harrows are of wood as are the teeth in the

front also, and all the rest supplied only with long tangles of sea-ware tied to the harrow by the small ends; the roots hanging loose behind, scatter the clods broken by the wooden teeth." The St. Kildans had little cows, horned sheep, and some ponies.

Martin tells how the Hebrideans prepared their corn for food:

"A woman, sitting down, takes a handful of corn, holding it by the stalks in her left hand, and then sets fire to the ears, which are presently in a flame. She has a stick in her right hand, which she manages very dexterously, beating off the grains at the very instant when the husk is quite burnt. . . . The corn may be so dressed, winnowed, ground, and baked, within an hour after reaping from the ground."

The custom of preparing corn for food only when it was wanted must have been a very ancient one, for the Greek traveller, Poseidonius, who was born about 135 B.C., tells of a district in ancient Britain "where the people have mean habitations constructed for the most part of rushes or sticks, and their harvest consists in cutting off the ears of corn and storing them in pits underground: they take out each day the corn which has been longest stored and dress the ears for food."

Before grinding-mills came into use, the grain was pounded on a slab of stone or a hollow in a rock with a stone held in the right hand.

The earliest settlers in Crete made pottery of a coarse kind for cooking and storing food. Their women were spinners and weavers, as we know, because their bobbins and spindle weights have been found. Tools were made of stone, bone, and horn. They had no metal tools, but they made arrow-heads, knives, and razors of obsidian, a natural glass of volcanic

origin which when split in flakes has a very sharp edge. They obtained the obsidian from the island of Melos, which lies between Crete and the coast of Greece. The seafarers must, therefore, have made regular voyages to obtain supplies of obsidian.

It is not known where these earliest Cretan settlers came from. Some may have reached the island from the North African coast and others from Asia Minor, cruising among the numerous small islands of the Cyclades where one is never out of sight of land.

For many centuries the Cretans lived their simple lives with little change, just like the St. Kildans on their lonely island in the north-western Hebrides, which cannot be approached by small boats except in the summer season.

Some time before 3000 B.C., however, large numbers of colonists reached Crete from Egypt. They were much more advanced in civilization than were the natives, and they had tools and weapons of copper. They made Crete their permanent home, laying the foundations of the civilization which Sir Arthur Evans has named the Minoan, after King Minos, who, according to Greek tradition, ruled over the island.

It is believed that for some time there was a steady stream of migration from the delta coast to Crete. Apparently it was caused chiefly by the wars which had long been waged in Egypt. That country had for many centuries been divided into petty states. In time, as told in Chapter XV, one state conquered another until there were two main groups forming the rival kingdoms of Lower (or Northern) Egypt and Upper (or Southern) Egypt. The memory of this early division was preserved during the whole period of ancient Egyptian civilization, for Egypt was always referred to as the "Two Lands".

A few centuries before 3000 B.C. the armies of Upper Egypt gradually conquered Lower Egypt. According to Egyptian tradition the final stage of the conquest was carried through by King Menes, who ruled supreme over the "Two Lands". It may be that when Menes won his final victory, many of the nobles of Lower Egypt preferred to settle in another land rather than live under the rule of the conqueror. Others were likely to follow them as favourable reports were received regarding the experiences of the settlers in Crete. No doubt, rebellions broke out from time to time in Lower Egypt, and when these were suppressed the leaders and their armies would be forced to migrate across the Mediterranean to escape arrest and punishment.

Crete was not the only country which received large numbers of new settlers at this period. Southern Greece, the islands of the Cyclades, and parts of Asia Minor, including Troy on the south side of the entrance to the Dardanelles, were all occupied by new-comers. We know that the immigrants did not come from the north, because there is no trace of them among the remains of Thessaly in northern Greece. There were also settlers on Cyprus and on the coasts of Syria and Palestine. In all these areas copper was introduced, and cutting tools were made of that metal, while gold and silver were used for ornaments or amulets. Flint, obsidian, and hard stone were still used for tools and arrow-heads and continued in use for a long time. Agriculture of a more advanced kind than had for long been practised in Crete was adopted all through the area occupied by the new settlers.

The Egyptians who made their homes in Crete were able to establish a free state, or several free states, safely beyond the reach of the pharaoh. Having fled from the tyranny

established by Menes, they appear to have appreciated to the full the freedom they enjoyed in a new country. It is interesting to find how the Minoans (as they are called by modern writers) fostered the spirit of freedom. They built small towns in which the citizens had more liberty than was enjoyed in Egypt. No pharaoh could force them to provide free labour for several months each year to erect great pyramids and temples. In the Egyptian cities there were large slum areas in which the workers lived in miserable huts of clay. In Crete there were substantial houses of stone, each with several rooms, and there were small workshops in which artisans plied their trades and profited from them. The Egyptian artisans were kept in a state of semi-slavery by the pharaoh, the nobles, and priests; the Cretan artisans were small traders.

The spirit of liberty which prevailed in Crete can be detected in Minoan art, the best of which is devoid of the formalism of the art of Egypt. The artists and sculptors of Egypt were constantly employed by the priests, and their products had a religious significance. In Crete the eyes of the artists were open to the beauties of nature in their fields and gardens, in the woodlands and on the shores and in the sea. Their pottery and the walls of their houses were decorated with objects of natural beauty.

Although the refugees and other settlers in Crete introduced the elements of Egyptian civilization and were influenced also in time by the civilization of Mesopotamia, they were never slavish imitators. They made progress in an atmosphere of freedom on their sea-girt island, facing new problems and solving them in their own way. The island had its own needs and these had to be faced and provided for.

Several small towns were established, and it was necessary

that these should be connected with roads. This was a necessity which was scarcely known in Egypt. In that country the River Nile was the "highway" along which traffic passed from town to town on rafts, barges, and sailing-boats. The only well-made roads were those laid between quarries and the river, between the river and a large building in course of construction, and from the royal palace to a temple.

The Cretans were the first people who had a complex system of roads for traffic. One road ran from Knossos (near Candia) on the north side of the island to Phæstos in the south. Other roads were connected with it, running eastward to the small towns of Mallia and Gournia, and from Gournia to the eastern ports of Palaikastro and Zakro. Portions of roadway laid bare at Knossos show that, in time, the Minoans made a great advance in road construction. They laid a bottom of stones which was covered with concrete and earth. Bridges of stone were erected over small streams. When the Minoans founded towns in southern Greece, one of them was known as "Mycenæ of the broad ways". After the Hellenic peoples took possession of Greece they found and used a fine system of highways which they never improved upon. Ultimately the Romans became the chief makers of roads in Europe.

The Minoans also introduced a wonderful drainage system, and they laid pipes to carry water-supplies from a distance.

In the next chapter the story of Minoan progress is given in outline. As the scripts used on the island in ancient times cannot be read, it is not possible to throw a full light on all the problems which arise.

CHAPTER XVIII

The Ocean Kings of Crete

In the records of ancient Egypt the Minoans of Crete are referred to chiefly as the Keftiu ("peoples of the sea"), but this term does not appear to have been confined to them alone, for it was applied to other seafarers as well. The Cretans were, however, for a long period the chief sea-traders who reached Egypt to sell their goods and make purchases to carry home.

The earliest Cretans who traded with Egypt were settled at Phaistos in the south side of Crete. In the *Odyssey* (Book III), the Greek epic by the poet Homer, we get a glimpse of the perils faced on the southern coast of Crete by early mariners. It is told that part of a fleet of "dark-prowed ships" was driven by the "shrill winds" and "swelling waves" towards "the steep shore", where a gale casts big billows "against the left headland towards Phaistos", and that "a small rock keeps back the great waters". Some of the ships were wrecked, but five escaped, for "the wind and waves carried them nigh to Egypt".

In another part of the *Odyssey* (Book XIX) the poet sings of "the land called Crete in the midst of the wine-dark sea", which has many cities, the chief of which is Knossos. He tells of a hero who when on his voyage to Troy was caught in a storm. "The mighty wind drove him to Crete", and he sought refuge in one of "the havens hard to win, scarcely escaping the tempest". There for twelve days "the north wind penned" the sailors.

A vivid account of a storm in the eastern Mediterranean is

given in the Bible (*Acts of the Apostles*, chap. xxvii). Paul set out in a ship to go to Italy, "meaning to sail by the coasts". He was, however, transferred to another ship and it sailed towards Crete. Paul advised the Roman centurion to winter in a haven on the island coast, but the master and owner of the ship wished to push on to another haven. Suddenly a storm came on:

"And when the ship was caught and could not bear up into the wind we let her drive."

The writer of the "Acts" tells that the vessel was tossed about for a fortnight. At length the island of Melita was reached. An attempt was made to beach the ship, but some distance from the shore she grounded on a bank. "The fore-part stuck fast" and "the hinder-part was broken with the violence of the waves". Some of the men swam ashore, and the rest reached safety, "some on boards and some on broken pieces of the ship".

These extracts serve to remind us of the perils which the early seafarers of Crete had to face when on voyages to and from other lands. They became expert navigators, but there must have been many disasters at sea. The strongest Cretan ships were built of cedar wood, as we gather from Egyptian and Greek records, and the Cretans not only transported cedar from Lebanon for their own use but also on occasion supplied it to the Egyptians. The drifting of big rafts of cedar logs from the Syrian coast was an imposing task for the early navigators. An early Egyptian pharaoh, named Snefru, who died before 2900 B.C., found it necessary to send a fleet of no fewer than forty ships to bring cedar from Lebanon.

Relics of the ancient Egypto-Cretan commercial relations

have been brought to light. Cretan objects found in Egypt and Egyptian objects found in Crete make it possible to date the periods of Minoan civilization. Sir Arthur Evans has divided what archaeologists call the "pre-history" of the island into three main periods. These are the Early Minoan, the Middle Minoan, and the Late Minoan periods. Each has been subdivided and dated as follows:

Period.			Probable Date B.C.
Early Minoan I	...	...	3400-2800
Early Minoan II	...	...	2800-2400
Early Minoan III	...	...	2400-2100
Middle Minoan I	...	...	2100-1900
Middle Minoan II	...	...	1900-1700
Middle Minoan III	...	...	1700-1580
Late Minoan I	...	...	1580-1450
Late Minoan II	...	...	1450-1400
Late Minoan III	...	...	1400-1200

Early Minoan I begins with the arrival in Crete of the settlers from Egypt, and of some non-Egyptian settlers, probably from Asia Minor, who had been influenced by Mesopotamian civilization. Trading relations with Egypt and with the Cyclades began early, and there is evidence that Greece and Troy were reached. The long ships with high prows, like the type depicted in Egypt at an early period, were painted on Minoan pottery.

Copper continued in use for a time, but suddenly bronze was introduced into Crete. It appears to have come from Asia, perhaps by way of Troy, and the Minoans then began to manufacture this amalgam. Before they could do so, however, they had to obtain tin, but it is not certain where the earliest supplies of that rare metal were obtained. The source may have been northern Persia or some area in Asia

Minor. Ultimately supplies were drawn from the west. It is known that there were at one time deposits of tin in western Italy, in Spain, and in north-western France, but the richest tin deposits of Europe were to be found in south-western England. The search for tin must have kept explorers active for a long period. Seafarers of Crete appear to have been engaged in this search. In a burial cave in Etruria in western Italy archæologists have found a typical Early Minoan dagger and two tin buttons. Apparently tin was highly prized by the man in whose tomb these buttons were placed. These may have been his "mascots" for his tin-searching voyages. Etruria became known subsequently as the land of the Etruscans, a people who had connexions with the Ægean area, and with the settlements of easterners in south-western Spain who visited Britain and obtained tin from Cornwall and jet from Whitby in Yorkshire. Perhaps the Etruscans were a mixed people. Overland traders from Central Europe may have met and mingled with seafarers in Etruria and formed the Etruscan nation, which was very powerful when Rome was still a very small city state.

The Minoans of Crete prospered during the four centuries of the Early Minoan II period, which came to a close about 2400 B.C. One or two trading towns in the eastern part of the island, including Palaikastro and Zakro, seem to have been independent. During the three centuries of the Early Minoan III period, however, the influence of Knossos on the northern coast of the central part of the island was growing steadily, as was also that of Phæstos in the south. Rival kings may have reigned at both these centres for a time, but ultimately there was only one ruling family. Palaces were erected at Knossos and Phæstos.

At Knossos clay jars about as big as modern beer casks were manufactured to store olive oil, which was in great demand in Egypt. Standard weights were in use, including the Egyptian shekel, and merchants had button seals made of Egyptian ivory to mark as their personal property the bales of goods which were carried to foreign markets by the Minoan seafarers.

Great progress was made in the arts and crafts in the Middle Minoan I period. The goldsmiths produced fine jewellery, imitating natural objects, and gems were carved with wonderful skill. Potters, having acquired the potter's wheel, were manufacturing beautiful wares which were carried by the Minoan sea-traders to the Cyclades, to Cyprus, to the Syrian coast, and to Egypt. A remarkable find in the ruins of the early palace of Knossos is the statuette of an Egyptian noble which had been shaped in the Nile valley. At the period to which this statuette belongs, Cretan ware of a type called Kamares reached Upper Egypt. Evidently the Minoans and the Egyptians were in close touch. Some think that the rise of the kingship in Crete was due to very intimate Egyptian influence. On the other hand, it may well be that the Minoan governing class at Knossos were merely imitating the Egyptian method of government.

Great changes were meantime taking place in the area which was to become known as Greece. The Achæans, a people of Aryan speech, were moving southward through Thessaly. They were armed with effective bronze weapons, and they changed the simple civilization of the country which they conquered. Intruders reached the Cyclades, but it is not certain whence they came.

The Middle Minoan II period was brought to a close by a



Section of the Frieze in a Minoan Pavilion discovered at Knossos

Hoopoes occur at intervals among red-legged partridges. Reproduced by permission of Sir Arthur Evans.

disaster in Crete in 1700 B.C. Palaces and other buildings were suddenly wrecked, not only in the centre of the island but also in the eastern towns of Palaikastro, Zakro, &c. Fires broke out, as we know, for at Knossos ashes lie over part of the Middle Minoan II remains. Some of the remains, however, have been discovered under the debris of fallen walls.

Sir Arthur Evans has suggested that a great earthquake had taken place. Fires may have broken out among the ruins of buildings when fallen timber was ignited from the hearths. This explanation seems to be a better one than the theory of an invasion from Asia Minor or from the mainland of the country that was to become known as Greece. It may be, however, that a revolution broke out in Crete after the earthquake took place. This disaster may have been regarded as a sign that the gods were angry with the existing state of affairs.

In the next period—Middle Minoan III—it is found that the power of Crete in the Ægean area not only remained strong but had grown stronger than before. New palaces were built at Knossos and Phaistos, and the other towns were repaired. A new town was founded at Gournia in the Gulf of Mirabello on the north coast of eastern Crete. Knossos became more important than ever, and it may be that the king, who had his seat in the new palace there, ruled over the whole island, and the prince who lived in the palace of Phaistos was subject to him. The power of Knossos spread to southern Greece, where Minoan colonists were settling as traders.

In the Late Minoan I period (1580–1450 B.C.) the Minoan influence in Crete advanced steadily, and Mycenæ, Tiryns, and other towns on the Greek mainland were becoming important centres of commerce. The Minoan seafarers were also carrying

on a brisk trade in the western Mediterranean area. There were colonies in Sicily, Sardinia, and southern Spain, and from these enterprising explorers had for long been visiting the north-western coast of Gaul and south-western England. Southern Russia was reached by the merchants who sailed up the Dardanelles and coasted round the Black Sea. The influence of the Minoans also reached central Europe.

It is customary to refer to the Late Minoan II period, which lasted for about half a century (1450-1400 B.C.), as the "Golden Age of Crete". Knossos had become the chief centre of commerce on the island, and the towns of Gournia, Palaikastro, and Zakro shrank in importance. The Minos kings (perhaps Minos was a royal title) were supreme, and the rulers of Mycenæ, Tiryns, Thebes, Corinth, and Athens were their vassals. During the Late Minoan I period Egypt had made great conquests in western Asia, and the Minoan king at Knossos sent presents to the Pharaoh Thothmes III, "the Napoleon of Egypt". Apparently Crete had benefited greatly by the peace which the Egyptians were able to establish in western Asia.

Thucydides, the Greek historian, who was born about 471 B.C., heard traditions about the King of Crete, who was remembered as Minos, and wrote:

"The first person known to us by tradition as having established a navy is Minos. He made himself master of what is now called the Hellenic Sea, and ruled over the Cyclades, into most of which he sent the first colonists, expelling the Carians and appointing his own sons governors; and thus did his best to put down piracy in those waters, a necessary step to secure revenues for his own use. For in early times the Hellenes (Greeks) and the barbarians of the coast and islands, as communication by sea became more common, were tempted to turn pirates, under the leadership of their most powerful men; the motives being to get wealth for themselves and to support their poor. They would fall upon a town unprotected by walls, and consisting of

a mere collection of villages, and would plunder it. Indeed this came to be the main source of their livelihood, no disgrace being yet attached to such an achievement, but even some glory.

"An illustration of this is furnished by the honour with which some of the inhabitants of the continent still regard a successful marauder, and by the question we find the old poets making the people ask of the seafarers, 'Are you pirates?' It seems as if those who were asked such a question were not ashamed to confess they were and that the questioners did not reproach them for being pirates. The same system of robbery was common on land also."

The historian tells that the ancient inhabitants of Greece used to find it necessary to carry weapons to protect themselves and their homes against sea and land robbers. Towns had to be built at some distance from the sea and to be protected by walls. After Minos built his navy "communication by sea became safer", the historian tells us:

"The coast populations began to apply themselves more closely to the acquisition of wealth, and their life became more settled; some began to build strong walls to protect their property. The love of gain reconciled the weaker to the government of the stronger, while the possession of capital made it possible for the powerful cities to reduce the smaller ones to subjection."

The Cretan towns were not fortified like those on the Greek mainland. Minos depended for the defence of his country upon his "wooden walls", that is, his navy; but a time came when his rivals suddenly crossed the sea from the coast of southern Greece and landed a strong army in Crete, which overthrew the Minoan power. According to tradition Minos had gone to Sicily with his fleet to make conquests there when undefended Crete was attacked by his powerful rivals.

The palaces of Knossos and Phaestos were taken and set on fire, while the towns of Gournia, Pseira, Zakro, and Palaikastro were sacked and given to the flames. A new government was

set up, but Crete was after that time simply a subject state, for the supremacy had passed to Mycenæ and Tiryns and other city states on the mainland. Many Minoan refugees fled across the sea and settled in Cyprus, Asia Minor, and Syria; others found new homes on the islands in the west.

CHAPTER XIX

Colonies of Farmers and Sailors

A new era dawned in western Europe when the last land movement was taking place and the country we know as Britain was finally separated from the continent. The archæologists have called it the Neolithic (new stone) Age because certain tools were polished and were given sharp edges by being rubbed on grindstones. Not only was flint treated in this way but also other very hard stones.

Flint arrow-heads were still chipped, but with much greater skill than were Azilian flints, and they were given a variety of forms which recalled those of earlier times, some imitating the horn harpoons by being barbed, others the older leaf-shaped and triangular lance-points, while some forms were quite new.

The polished stone axe or adze was a wonderful invention. When a genuine one is laid on its side it is found to be so perfectly balanced that it revolves on a centre of gravity. It was, no doubt, sharpened on a grindstone, but it must first have been carefully measured, and then polished with the aid of emery or sand.

This kind of stone axe or adze proved to be very useful and continued in use long after metal tools were invented. Indeed, it is only in our own day that the stone axe has begun finally to disappear. In Polynesia, into which area it was introduced by seafarers, boat-builders did excellent and delicate work with it in quite recent times. An American writer tells that he saw a Polynesian workman using a polished stone adze with great skill, and says:

"In watching the shaping of a canoe I have seen the old canoe-maker use for the rough shaping and excavating an ordinary foreign steel adze; but for the finishing touches he dropped the foreign tool and returned to the adze of his ancestors, and the blunt-looking stone cut off a delicate shaving from the very hard *Koa* wood, and never seemed to take too much wood, as the foreign adze was apt to do. That skill was an important element in the use, I was convinced, for with all the teaching of the native I could only make a dent where I tried to raise a shaving."

When the term "Neolithic Age" is applied to a period of history in western Europe, it refers to much more than the new method of working stone. A very definite era of progress had set in during this age. Agriculture was introduced, herds and flocks of domesticated animals were kept, fruit-trees were cultivated. Flax was grown so that linen might be made from it, wool was used to make clothing by knitting and weaving, and pottery was manufactured.

Of great importance, too, is the fact that boats came into use in western Europe in the Neolithic Age.

Some archæologists have drawn attention of late to the interesting fact that Neolithic culture in Europe was, to begin with, mainly coastal—that is, it crept along the shores of the Mediterranean before it penetrated into central Europe. The seeds of cultivated barley, wheat, &c., were evidently carried

by ancient mariners to the lands occupied by Azilian and other fishermen and hunters.

The natives among whom the newcomers settled did not necessarily change at once their ancient habits of life. Some time must have elapsed before agricultural civilization was adopted. Its benefits would have been appreciated first during a period of scarcity, when, owing to cold and stormy weather, animals became scarce and fish difficult to obtain. The food producers would then be able to give hospitality to hungry hunters and their families. When the strangers had acquired knowledge of the language of the natives and were able to converse with them, a beginning would be made in giving them instruction and help in return for services rendered. The natives had, of course, to obtain supplies of seed, but it was absolutely necessary that they should also acquire knowledge of the agricultural calendar if they were to conduct farming operations with success. They had therefore to be taught to study the movements of the heavenly bodies. In this connexion it is of interest to find that in primitive agricultural communities farming operations are timed by the rising of certain stars or the seasonal aspect of groups of stars. The "clock" of the seasons in ancient Europe was the constellation of *Ursa Major* ("The Great Bear"), which in our agricultural folk-lore has been remembered by such significant names as "The Plough" and "Charles's Wain". It will be observed that when this group of stars becomes visible as night comes on, the "tail" or "handle" is directed eastward in spring, southward in summer, westward in autumn, and northward in winter. Sowing time is indicated in our own land when the "handle" of "The Plough" points towards the east. The month is measured by the moon, and we have

not yet forgotten the "Harvest moon", while the ancient belief that the moon exercises a beneficial influence upon crops is still widely remembered. In Gaelic folk-lore we also detect an interest in the sun. The year was divided into two parts—the period of the "big sun" of summer and the period of the "little sun" of winter. Each of these periods was subdivided, and the year had therefore four quarters. Ceremonies were performed at the beginning of each quarter to ensure health, wealth, and prosperity—that is, "luck". Bonfires were lit and men and cattle were supposed to receive protection by passing through the smoke or over the embers. It was possible, too, according to folk-belief, to peer into the future on the night preceding a quarter day. Hence the divination ceremonies connected with Hallowe'en, New Year's Day, Beltane (1st May), and Midsummer's Night. According to Gaelic folk-belief, each quarter was critical, for the fairies, giants, and other supernatural beings then broke loose, and human beings had to protect themselves by reciting charms, hanging certain plants round their dwellings—the Christmas decoration of houses had origin in this custom—and by performing protective ceremonies. The introduction of the agricultural calendar thus entailed the introduction of the magico-religious ideas and practices, and also the myths connected with the agricultural mode of life.

Every phase of agricultural life is found to have a heritage of immemorial superstitious practices. When, for instance, a field had been tilled, the sowing was performed by an elderly man. If he should be interrupted, some misfortune was sure to happen. The sower was possessed of charms which aided him in his work. A Gaelic folk-story tells that one day an elderly Hebridean, who carried seed oats in a sheet suspended

from his shoulders like a plaid, was engaged in sowing, when a man, observing that the supply of seed did not seem to diminish, uttered a magical exclamation and asked if the sheet would never be emptied. Immediately a small fairy bird flew out of the sheet and the supply of seed was soon exhausted, part of the field remaining unsown. The spell had been broken!

In agricultural folk-lore we find fragments of myths that could not possibly have had origin in this country and may have been imported with the agricultural mode of life. A Scottish folk-tale, for instance, describes an underworld paradise in which the dead are seen reaping corn in fields watered by numerous small streams. We have here, apparently, a memory of the paradise of Osiris, the streams being the irrigation channels of Egypt.

A Gaelic story explains why a famous seer was called "Son of the dead woman". His father had been slain and dismembered by an enemy, and the widow engaged a tailor to sew the body together before burial. After she herself died, her ghost appeared to the tailor, requesting him to open her grave. He did so and found in it a newly-born child whom he fostered. This seems like a version of the myth of Set slaying Osiris and the posthumous birth of Horus.

The earliest centre of Neolithic culture in Europe was the island of Crete. Cretan and other seafarers sailed westward towards Sicily and Italy and ultimately to Spain; and we have already seen that some daring explorers navigated their boats as far north as the River Clyde in south-western Scotland.

It is not possible to date the beginnings of Neolithic civilization in the various parts of Europe in which it was established.

Once the new quickening influence from the east made the hunters and fishermen in a particular area adopt new habits of life, progress set in and local development took place. Local inventors introduced new forms of tools, and made new use of the tools they had acquired from colonists.

People who lived on islands had often to put to sea to obtain materials which they required, and these improved their boats and became better navigators. Those peoples who lived in inland valleys were more concerned about other things than boat-building. Some erected lake dwellings by cutting down trees and erecting the houses on "stilts", so as to be safe from the attacks of beasts of prey and human robbers.

There were "lake dwellers" in Switzerland and their relics show how their civilization was developed. The earliest had stone axes or adzes made from local rock. They also used bone tools and they made pottery. Then larger stone axes or adzes came into use, and some of these were made from rock not found in Switzerland. Apparently the improved stone tool was introduced by new settlers. The third phase shows improved stone-working as a result of local development; but as metal was coming into use, it is possible that the late quickening influence resulted from the arrival of new peoples.

In Crete the artisans made sharp knives from obsidian—a natural glass from hardened lava. The obsidian was imported by mariners from the island of Melos in the Cyclades (the islands sprinkled over the *Ægean* sea). From Naxos they obtained emery, and it was used for making stone bowls by grinding them into shape and hollowing them out with the aid of drills. Emery was also introduced into Egypt and used there by the workmen who made small and large stone vessels.

The seafarers who settled in Malta imported jade and

jadeite to make little axe-head amulets as occasionally did the pre-dynastic Egyptians.

In ancient as in modern times, the seafarers searched for and traded in articles that may be referred to as luxuries. Some of these were used for superstitious reasons. They believed that if certain things were worn as ornaments, the life of the wearers would be prolonged. They were thus supposed to be "lucky" as mascots, protecting individuals against accidents, bringing them "good fortune" and so on.

One substance which came into fashion as a "luck bringer" was amber. Experts have examined the amber ornaments discovered in some ancient sites in southern Europe and find that a good deal of it came from the Baltic. The demand for lucky amber must have made the early people go on long voyages or undertake long journeys. An important result of the traffic in amber was the diffusion of civilization in the areas visited by the traders.

The Neolithic era of progress was introduced into the country we now know as England by seafarers. The islands known as Britain and Ireland then were very thinly peopled by hunters and fishermen. After the seafarers began to arrive, however, the seeds of barley, wheat, &c., and of certain fruit-trees were introduced, as were also domesticated animals. Then little communities were formed in localities suitable for farming and gardening.

The Neolithic civilization spread gradually throughout Britain, but although in some districts the Neolithic implements came into fashion, the people were chiefly hunters and fishermen all the year round. They thus continued to be "food gatherers", although they owed much to the agriculturists who were "food producers". It is possible that it was

from the seafarers who introduced the elements of Neolithic civilization that the hunters learned how to preserve flesh by salting it.

In some of the old Celtic folk-stories we find memories of the life led by people who were chiefly hunters. A Gaelic tale tells of a band of ancient hunters on the island of Skye. During the winter they lived in a cave, their chief food being shell-fish and milk. One day a hunter called "Thinman", who was a swift runner, was "sent out to look for deer". The others "gathered limpets at Loch Snizort". "When he (Thinman) saw the game, he gave a shout which was heard by the rest . . . who were at the time eating shell-fish at Loch Snizort." They at once left "the unsavoury food" and "set off to where the chase was to be found".

Another old Gaelic story tells that during a long hard winter the hunters lived in small houses surrounded by a stockade. There were no signs of deer, and food was therefore very scarce. The women, however, "still kept their good looks, while the men were becoming meagre and ill-looking". It was found, the story tells, that the women were getting nourishment from the "leaves of trees, the roots of heather, and tops of hazels". Another version of the tale tells that the women ate "the roots of ferns".

A curious old Gaelic story is about a hunter who had "the right to marrow bones". He was called "Goll" because he was squint-eyed. Goll kept the largest of the marrow bones for his mother. She "was aged, and had lost her teeth", and "she lived on the marrow".

In certain stories we find that some of the hunters had spears of hard wood. They were accustomed to make these sharp by thrusting them into a fire and then rubbing them on rock.

CHAPTER XX

The Discovery of Metals

The discovery of metals was one of very great importance in the history of early man. Antiquaries are not agreed where this discovery was first made. Some favour Egypt, some Asia Minor, and some an area in south-western Persia which was anciently known as Elam.

The metals first used were gold and copper and iron. Now, Egypt was the country which in ancient times was famous for its gold. It was found chiefly in the Eastern Desert between Upper Egypt and the Red Sea. A writer on the subject tells us:

"Prospectors in the Eastern Desert report that immense alluvial workings are encountered, especially in the Wadi Allagi, where the hills, as a result, have the appearance of having been ploughed. Quite 100 square miles of country has been worked to an average depth of seven feet. So thoroughly has this been done that only the merest traces of gold remain."

A wadi is a dry water-course, which was formed when Egypt was a wetter country than it is in our day. At the time when Europe was partly covered with ice, torrents poured down from the Eastern Desert into the great lake which lay between the east and west cliffs of Egypt.

The ancient Egyptians found gold in veins of quartz in some of the wadis, while nuggets of gold and gold-dust were washed from the old torrent beds of gravel and sand.

In some part of the Eastern Desert small "pockets" of gold are still found. After one of those rare showers of rain, which fall perhaps once in three years in the Eastern Desert,

the gold-dust can be seen glittering in the moonlight, having been "washed" out by the pelting rain. Perhaps the earliest workers in metal learned how to "wash" gold from the sand after seeing the rain doing it.

Gold is a soft metal and useless for making tools. The Egyptians used it, as other peoples used amber, to make lucky ornaments or amulets. Some of the oldest gold ornaments were models of whorled snail-shells. Snail-shells and sea-shells were worn in Egypt at a very early period as they were by the Cro-Magnons in western Europe. The handles of some ancient Egyptian flint knives were covered with or made of gold, as has been already stated.

The people who lived in Egypt before the historical period not only used gold for lucky ornaments but also pieces of the beautiful green stone called malachite. Now, malachite is an ore of copper. It is found in some of the wadis and among the hills of the Eastern Desert. When malachite is placed in a fire, copper runs out of it. Perhaps copper was first discovered by accident, a piece of malachite having fallen into a fire.

In some of the pre-dynastic graves of Egypt the archæologists have found copper needles with one end bent so as to form what has been called the "hook-eye". Pins of copper were used also. These and copper beads and copper bracelets were worn long before any cutting-tools of copper had been invented. The first copper tools were chisels, which were invented during the latter part of the pre-dynastic age.

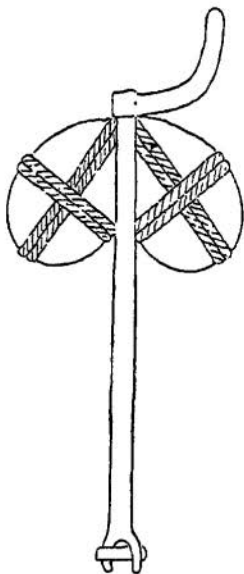
Iron was used in pre-dynastic Egypt, as was gold, as a luck-bringing or sacred metal. Beads of hammered iron have been found in some pre-dynastic graves. One necklace had iron beads strung alternately with gold beads.

The earliest known Egyptian text referring to iron belongs

to the age when the pyramids were being erected as tombs for the pharaohs. Iron is called "Metal of the Sky". The Egyptians believed that the sky was made of iron, but whether they did so because they discovered that aërolites (iron meteors) fall from the sky, or because they had connected iron as a sacred metal with a deity of the sky, is uncertain. After iron beads went out of fashion, little pieces of hammered iron were, during the early dynasties, used as "lucky objects", but no iron weapons were known in Egypt before 1200 B.C.

An important invention was made in Egypt some time before 3000 B.C. This was the crank drill, which was used for drilling out stone vessels. Below the handle two stone weights were suspended, and these served the same purpose as does a modern fly-wheel; they kept the shaft revolving. The point of the shaft was forked so as to hold a "cutter". At first the cutter was a hard and sharp stone. Then a copper cutter was introduced.

With this invention of the crank-driven shaft the "Age of Machinery" began. As Professor Breasted emphasizes, the revolving machine "involved the essential principle of the wheel with a vertical axis". The wheel "as a burden-bearing device with a horizontal axis" was not, however, invented in



Egyptian Crank Drill invented in the early Dynastic Period (about 3400-3000 B.C.)

(After Borchardt.)

Egypt, but, so far as we know, in Mesopotamia. The Egyptians used round logs by placing them under blocks of stone which were hauled from the quarries, but they did not invent the wheeled cart. The potter's wheel was in use in Elam (western Persia) at an early period, and, as some think, before it was in use in Egypt.

For many centuries after copper was utilized in Egypt for making chisels, drill-cutters, &c., flint knives, flint arrow-heads, &c., were still being made. Indeed, stone tools continued in use in Egypt till about 2000 B.C. Not a few archæologists are of opinion that polished stone axes or adzes were invented after the introduction of copper tools. These stone axes are a feature of the Neolithic Age in western Europe.

Egypt, in that case, passed from its Palæolithic Age to its Copper Age, during which gold and iron were worked, before its Neolithic industry was developed.

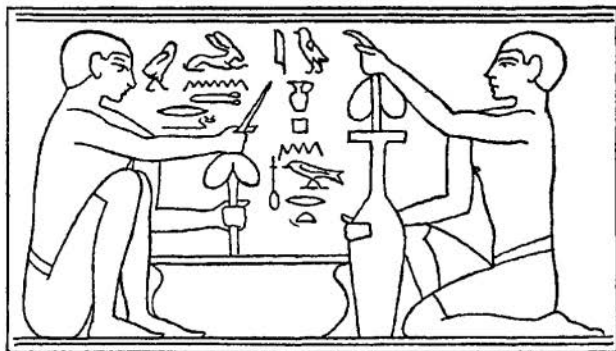
Bronze was introduced into Egypt long after it had been known in Crete and in western Asia. The invention of bronze, which is an amalgam of copper and tin, took place somewhere in northern Mesopotamia or northern Persia. It was possibly the Sumerian colonists who, about 3000 B.C., discovered that soft Asiatic copper could be hardened by mixing it with a small proportion of tin. The copper found and used by the Egyptians was naturally hard.

It was not until about 2000 B.C. that bronze daggers and razors were becoming common in Egypt. Swords of bronze and bronze battle-axes were being adopted, but copper weapons continued in use. The general adoption of bronze came later.

In western and central Europe the order of the archæological

ages was (1) the Palæolithic, (2) the Neolithic, (3) the Bronze, and (4) the Iron. There is no trace of iron having been used in Europe before bronze was introduced.

The European Neolithic industry appears to have been introduced by intruders who had adopted the agricultural mode of life and in some areas searched for and used gold. In southern Spain the early users of Neolithic tools gathered



Egyptian Craftsmen engaged in Drilling out Stone Vessels with the Crank Drill

The hieroglyphs record the workmen's conversation. One says: "This is a very beautiful vase". The other replies: "It is indeed". From a tomb relief (after De Morgan).

copper ores and exported them. Perhaps these were seafaring colonists from the east. In their own countries copper had long been in use, but they themselves used Neolithic tools. The early miners broke up gold-bearing quartz and copper ores with stone hammers. They did not always require metal tools for their work, Neolithic tools served them well in their activities as miners, agriculturists, and seafarers. Flint arrows and stone hammers continued in use in central and western Europe long after bronze was introduced. Metal

tools were adopted very gradually. Ores were scarce and had to be searched for far and near.

Bronze was introduced into Europe from western Asia. The metal-workers in that area are believed to have discovered tin at Khorassan in north-eastern Persia, and perhaps somewhere in Asia Minor too. Tin crystals are found in rocks and "stream-tin" in sand, and stream-tin, like gold-dust, can be "washed" from soil.

The early metal-workers may have made accidental discovery of tin by using "tin-stone" to bank their fires. Then probably they experimented with the new metal. In time, they discovered that the best bronze was produced by mixing ten per cent of tin with ninety per cent of copper. If thirty per cent of tin is mixed with seventy per cent of copper, the alloy is so brittle that it breaks very easily.

The bronze-carriers who entered Europe were making use of jade and jadeite as luck-bringing stones. They searched for and found these stones in Europe, in the eastern Alps. A variety of jadeite was worked near Maurach in Switzerland. Jadeite was found also at Mount Viso in Italy, while boulders of jade were discovered in Germany and layers of it in the Zobten mountains in Silesia. Jade pebbles have been picked up in the Western Isles of Scotland. In beds of tin a green stone, called "callais", is occasionally found. It resembles jade, but is really a variety of turquoise. Polished axe amulets were made of callais by the early metal-workers in Europe. It is unlikely, however, that jade, jadeite, and callais would have been searched for unless the metal-workers had, before entering Europe, regarded these hard coloured stones with superstitious reverence.

Search was made also for copper and tin. In time tin was

found in considerable quantities in Devon and Cornwall. At first it was picked up on the surface of the ground. Tin-mines were subsequently opened in Cornwall. Traces of tin have been located in the Scilly Isles, in Finland, in the province of Auvergne in central France, in Brittany, in Saxony, in western Spain, and in Morocco. There are Gaelic place-names in Scotland in which the name for tin occurs. Tin and copper are found together in Indo-China and China, as in Cornwall. Copper was found in South Wales, in north-western England, and in parts of Scotland. An ancient copper-mine was recently reopened in Shetland. Lead, which was scarce in ancient times, could be discovered in England, in south-eastern Scotland, chiefly at Linlithgow, and in the Orkneys.

In the south of Spain and Portugal traces have been discovered of colonists who were in touch with the old civilizations of Egypt and Mesopotamia. From their graves have been collected objects made of hippopotamus ivory from Egypt, beads made from African ostrich eggs, alabaster cups, painted vases, little idols very like those found in Crete, Troy, and Mesopotamia, &c. In one grave was discovered a gold coronet from Egypt and in another a shell from the Red Sea.

These colonists were seafarers, and must be distinguished from the carriers of bronze who entered Europe from western Asia and penetrated to central Europe. They sailed northward round the coasts of modern Spain, Portugal, and France, and reached the Baltic and the British Isles. Among their relics are objects of amber from the Baltic and jet from Whitby in Yorkshire. Reference has already been made to the greenstone axe found in one of the ancient Glasgow boats. Similar axes of greenstone have been unearthed among the remains of the ancient colonies of easterners in Spain.

The oldest forms of bronze tools and weapons come from western Asia. When bronze was introduced into Europe new forms were being adopted. The oldest Chinese bronzes are not of the earliest known types. The bronze axes and bronze sickles first used by the Mongols in the Chinese area are similar to those which were introduced into Europe.

During the Bronze Age, which began at different periods in different areas, there were widespread movements of races in Europe and Asia. When the searchers for metals founded colonies, backward peoples adopted the new civilization and developed it to suit local needs. New centres of civilization thus came into existence, and from these centres explorers and other adventurers went forth and reached and peopled out-lying areas.

On the island of Crete the great Minoan civilization began after copper had come into use. Then bronze was introduced, apparently from western Asia, and the Cretan Bronze Age continued until after the fall of the Minoan power. About 1200 B.C. iron was suddenly introduced into Crete from the Greek mainland by intruders who overran and conquered the island. These intruders had previously overrun the country which was to become known as Greece. They came from the north, probably from Asia Minor, and after settling in the Danube valley and mixing with the people there, they set out with their iron weapons to conquer ancient states in which bronze weapons were still in use.

Iron, as we have seen, was known and utilized at a very remote period in Egypt, but only as a "luck" metal. This superstitious iron connexion still survives in some areas where the expression "touch iron" may still be heard. Iron was supposed to protect one against fairies, witches, and other "enemies of man".

The Iron Age of the archaeologists does not begin, however, until iron began to supplant bronze for tools and weapons. Between 1300 and 1200 B.C. iron was used in Mesopotamia. The Hittites of Asia Minor worked iron-mines in the thirteenth century B.C. In northern Mesopotamia the Assyrians adopted iron weapons and iron armour, and their armies used the new weapons with terrible effect, making extensive conquests. A quantity of buried iron ingots has been unearthed in the ruins of the ancient Assyrian city of Nineveh, which lies opposite modern Mosul. The ingots were shaped like shuttles and were of various sizes, weighing from about nine pounds to forty-four pounds each. Each ingot was perforated at one end, as if to be strung so as to be easily carried by men and animals. Probably the supplies of iron required by the Assyrian blacksmiths were transported from the iron-mines of north-western Asia.

The Iron Age of Greece began after 1200 B.C. and the Cretan Iron Age before 1100 B.C. In the *Ægean* area the Iron Age is also called the "Homeric Age", because the warriors, whose exploits are celebrated in the epics of the Greek poet Homer, used weapons of iron as well as armour of bronze.

From the Danube area the use of iron passed into central Europe and into Italy, where the beginning of the Iron Age is usually dated about 1000 B.C.

In western Europe the working of iron was highly developed and improved and the earliest known steel was introduced. According to a Greek writer, the Romans adopted the swords made by the Iberians of Spain. He says, however, that although the Romans imitated the shapes of Iberian swords, they could not manufacture such good steel.

CHAPTER XXI

The Civilization of the Charioteers

When Julius Caesar wrote an account of his two expeditions to Britain, which were made in 55 B.C. and 54 B.C., he told that the inhabitants were numerous, that the houses were similar to those of Gaul, and that the people in the south had farms and flocks and herds. Chariots were used in battle, and the drivers were so well trained that they could pull up or turn their horses at a moment's notice, and run out along the chariot pole to stand astride the yoke, and then return quickly with astonishing dexterity.

A still earlier visitor was Pytheas, the Greek explorer, who sailed from Marseilles to Britain about the year 330 B.C. He wrote an account of his voyage, but it has not survived except in fragments, which are found quoted in the works of later writers. He sailed along the east coast as far north as Orkney, crossed the North Sea to Scandinavia, and returned to Britain again. According to Strabo, a Greek writer, who was born about 50 B.C., Pytheas saw farms in Britain. Instead of using open-air threshing floors, such as were known in southern Europe, the British farmers carried their corn-ears into barns and threshed them there. They had many domesticated animals. In the Hebrides the people did not till the land but lived solely on fish and milk. Apparently coal was used in some parts of Britain. Pytheas told that in a temple of a goddess the fires never went out, yet never whitened into ashes. "When," he related, "the fire has got dull, it turns into round lumps like stones."

In the northern parts of Britain, Pytheas found that the nights were bright and very short. The interval between sunset and sunrise was scarcely perceptible.

Pytheas appears to have visited Britain to obtain information regarding its trade for the Greek merchants at Marseilles. The Phoenicians of Carthage and Cadiz in Spain kept secret the route to the islands which yielded tin and were known vaguely as the Cassiterides. The Greek name for tin was "cassiteros", and S. Reinach, the French scholar, suggests that it was so called after the "Cassi", a Celtic people, who were engaged in the tin trade, and he cites the Celtic tribal names of Cassi-mara, Bodio-casses, Vidu-casses, &c.

In the *Iliad*, one of the two great epics of the Greek poet, Homer, who lived about 900 B.C., tin is called *cassiteros*. The poet may have heard about the wonderful land of Britain, where the summer nights were so short, for in his other epic, the *Odyssey* (Book X), there is an account of an island called Lamos where "double wages might be earned by a sleepless man, one wage as a cowherd and one as a shepherd of white flocks, because the out-goings of the night and the day are so very near".

Poseidonius, a Greek writer who visited Britain, found it was "thickly populated", and he saw many farms. "A number of kings and chiefs govern the country," he wrote, "and these, as a rule, live in peace with one another." In Cornwall the people were friendly to strangers. They worked the mines there, and conveyed tin in great quantities in their wagons to an island called Ictis, which could be reached at low tide. There it was purchased by merchants who transported it to Gaul (France), across which country it was carried by horses to the Mediterranean coast. Poseidonius also stated

that in war the Britons used chariots. When Scotland was invaded by the Romans under Agricola, the Caledonians also used chariots in battle.

Chariots came originally from Asia. They were used by the warriors whose battles are described in the *Iliad* of Homer, and they were introduced into central and western Europe during the archaeological Iron Age (900-100 B.C.). The first period of the Iron Age is known as the Hallstatt period, after Hallstatt in Austria. Hallstatt culture reached as far west as Spain and Portugal, but touched Britain only very slightly. It was during the second phase of this culture, which is dated from about 700 B.C. till 500 B.C., that chariots were laid in the tombs of Continental warriors. Greek objects have been found in some of the graves of the Hallstatt period in central Europe and in Italy. Bronze continued in use for a variety of purposes, but iron was favoured for weapons. Gold was used to make articles for personal wear, such as ear-rings, arm-rings, &c., and for religious purposes, as is suggested by a beautiful gold bowl with symbolic designs which belongs to the Late Hallstatt period, and was found near Zurich in Switzerland.

The next period of the Iron Age is known as the La Tène period. On the Continent it is dated from 500 B.C. till 100 B.C. or later. The culture of La Tène survived in Britain till the period of the Roman occupation. The name of this culture is derived from a typical site at La Tène, at the eastern end of Lake Neuchâtel in Switzerland. There, among the interesting discoveries which throw light on the customs of the people of the period, were wooden yokes for horses and oxen, parts of pack saddles, fish hooks, barbed tridents for weapons and for spearing fish, boat hooks, and boar spears. Evidently

at La Tène the agricultural mode of life was practised, horses were used by traders, fish were caught and wild animals were hunted. Dug-out canoes were favoured by fishermen. Warriors used chariots and also rode on horseback. Swords were of iron, and were made sharp by hammering their edges; their scabbards were of iron with bronze ornamentation, and many of these were engraved with animal and symbolic designs. Spears and javelins were common, but barbed-iron arrows were rare.

The chief warriors wore helmets of bronze. Some of these, including a fine example found in the Thames, London, were of horned design like the horned helmets of Mesopotamia, Greece, and Italy. Two types of shield were in use. At first the semi-cylindrical shield was favoured; then one of the 8-form variety became general. A magnificent specimen, developed from the latter type, was found in the Thames at Battersea and is known as the "Battersea Shield". It is of bronze and beautifully designed and ornamented with symbolic designs exquisitely used by the artist. In the red enamel "studs" are swastikas which were widely used in ancient times as symbols of divinity, and were probably supposed to have a protective value. Another symbol favoured was the wild boar. Tacitus, the Roman historian (*Germania*, Chap. XLV), tells us that the Baltic amber-traders regarded the boar as a religious symbol, and believed that the warriors who wore boar-amulets were protected by them in battle. Coral, which was imported from the Mediterranean, was used also as a protective agency, and weapons, helmets, and shields were adorned with it. Red enamel was a substitute for coral, and other precious substances were imitated in white, blue, and yellow enamels, so as to adorn amulets, chariot ornaments

of symbolic design, bits of horses, mirrors, &c. The enamels of the ancient Britons in England, Scotland, and Ireland are the finest ever manufactured by any craftsmen in the world. It is evident that there were highly-skilled artisans and decorative artists in Britain prior to the Roman occupation. Metal-working had reached a high state of excellence. It is a mistake to imagine that the ancient Britons were merely half savage and treacherous people, "running wild in the woods", until Roman civilization was introduced. The influences of the ancient Oriental civilizations had reached Britain before Rome was built. In ancient graves in south-western England have been found, for instance, blue beads of Egyptian manufacture which were imported as far back as the time of Tut-ankh-amon. Probably they came by sea. These beads were subsequently imitated by local craftsmen in England, Scotland, and Ireland. They are of a glassy character, having been manufactured by mixing copper and sandstone. It would appear, therefore, that not only were Oriental beads introduced into Britain, but also the knowledge of how to manufacture them, and the magico-religious beliefs which caused them to be worn as were protective coral-amulets and boar-amulets (or mascots). They were, in short, "luck beads". The habit of wearing certain things for "luck" has not entirely died out even in our own day. We still have amulets and mascots.

The battle-chariot was no longer used in Gaul (France) when Julius Cæsar conquered that country. The Roman soldiers were therefore greatly alarmed, as Cæsar tells, when they first came into conflict with the British charioteers. They had not been accustomed to this "arm" of warfare. When Agricola invaded Scotland, the Caledonians had chariots, and

there is evidence that chariots were common in Ireland also. Roads were necessary in those countries in which chariots and other wheeled vehicles were in use. Pre-Roman roads have been traced in England and Ireland, and in Scotland there are Gaelic place-names which indicate that there were ancient roads through certain mountain passes. After chariots ceased to be used, the old roads became "pony tracks".

Tacitus tells us in his *Life of Agricola* (Chap. XXIV) that in his day the harbours of Ireland were known to traders, and the manners and customs of the Irish people differed little from those of the ancient Britons. There are ancient Irish-Gaelic manuscripts dating back to the seventh century of the Christian era which refer to events in the first century and earlier. Later manuscripts contain retellings of the ancient oral hero-tales, the obsolete words being supplanted.

The chief tales deal with a war waged against the "Red Branch" warriors of Ulster by the other provinces of Ireland. Vivid descriptions are given of the combatants. In Connaught a force of 3000 fighting men was mustered, and it is told that they were in various "troops".

One troop had close-shorn, dark hair, and the men wore green mantles and many-coloured cloaks with silver brooches; their swords had silver-adorned hilts, and they had also spears and long shields.

Another troop had their hair cut short in front and left long at the back. They had white linen tunics with red ornamentation which came down to their knees, and above these dark-blue cloaks. Their swords had gold-covered hilts and silver fist-guards, their spears had five prongs, and they carried "shining shields".

Another troop was made up of fair-yellow and golden-

haired men, the hair being short in front and falling behind down to their shoulders. Their cloaks were of purple-red and finely adorned, and these were clasped with brooches of gold; their shields were curved and had sharp edges; their spears were of great length. Apparently this troop was well disciplined, for it is told that "together they raised their feet, and together they set them down again".

The chief hero of the Ulster army was Cuchulain, and it is told that he wore in battle a jacket of "tough, tanned, stout leather", which served "to keep off spears and points and irons and lances and arrows". He had also a "tough, well-sewn kilt of brown leather" which he wore over "silken trews". He had several weapons, including a five-pronged spear, and swords and javelins. A crested helmet protected his head, and on it were four "carbuncle gems". His chariot, which was driven by a red-haired man named Laeg, had iron wheels, and from it protruded scythe-like blades, spikes and prongs, while there were "stinging nails" on the poles. When Cuchulain rode against the foot-soldiers of the enemy he "mowed" them down and left "walls of corpses". In one attack he killed many "without having his blood drawn or wound brought to himself or his charioteer or either of his two horses".

The ancient Gaelic stories are of value in so far as they throw light on the manners and customs and the social organization of the Celtic peoples before the period of written history. It is found that there were among the Celts five classes of people. These were (1) the kings who governed in various districts as vassals of the "High King", (2) the aristocrats who owned land, (3) the Freemen who had property, (4) the Freemen who had no property, and (5) the men who

were not free, including serfs and slaves. The higher classes were the Celts, and the lower classes were mainly the descendants of the pre-Celtic peoples who had been subjected by the invading Celts.

The Celts of the Continent were farmers and stock-keepers. They reared horses, cows, sheep, and pigs. According to Roman writers they exported great quantities of salted and smoked bacon to Italy. It is of interest therefore to find that during the Iron Age there were many settlements in salt-yielding areas. The finds at Hallstatt in Austria, which are typical of early Iron Age culture, were made near ancient salt-mines. Hallstatt relics have been discovered in different parts of France near deposits of salt. Archaeologists have found evidence that there were Hallstatt salt factories, and that these were conducted on commercial lines. It may be that the culture we know by the name of Hallstatt had its basis in the wealth accumulated by the bacon industry which appears to have been of great economic importance in ancient times.

Commercial contact with south-eastern Europe is reflected in the pottery of the Hallstatt and La Tène cultures. Painted vessels of hand-made pottery of the early La Tène period in France reveal *Ægean* influence. The potter's wheel was introduced into central and western Europe during the last phase of La Tène culture, and it ultimately reached Britain. Specimens of wheel-turned pottery have been found in ancient Iron Age graves in England. Graves in which chariots have been placed have also been discovered.

During the La Tène phases of Iron Age culture large numbers of Celts appear to have invaded Britain and formed military aristocracies. They used chariots in battle and these remained

in use long after they had been superseded by cavalry in Celtic areas on the Continent.

The chariots went out of use in England after the Roman conquest, but, as has been indicated, the Caledonians were using them when Agricola waged his campaigns in Scotland. In the Irish manuscript tales there are references not only to chariot fighting, but to chariot racing at the games which were held on festive occasions. Chariots were, however, possessed by the kings and the nobles alone. One type had two wheels and another four wheels. The latter were used for travelling as well as fighting, and kings and queens rode in chariots which had coloured hoods adorned with the plumage of birds. The value of an ordinary chariot in Ireland was about twelve cows, but a royal chariot was worth about eighty or ninety cows. The driver was a man of high rank, next in importance to the warrior, and he was called the "ara", a name which survives till our own day in the surname MacAra.

Horsed chariots remained in use in Ireland till about the ninth century.

CHAPTER XXII

The Ancient Standing Stones

The most impressive works of ancient man in these islands, and in various parts of the Continent, are the "Standing Stones" or Megaliths. The word megalith means "large stone".

There are various types of megaliths. A single stone stand-

ing by itself is called a Menhir, "long stone", *men* being a Breton word for "stone". A big slab or boulder supported by other stones so as to form a chamber is called a Dolmen, "table stone", *dol* being the Breton word for "table" as "men" is for stone. Stones arranged in a circle are called Cromlechs, from the Gaelic word *crom*, "circle" or "curve", and *leac* (pronounced *lech*), a "flag-stone". Some writers wrongly apply "cromlech" to structures which are really "dolmens". Two stones set up to support a stone lintel form what is known as a Trilithon. When a number of standing stones are arranged in open lines, the group is called an Alinement.

The oldest megaliths were set up as far back as the archaeological Neolithic Age. The peoples of the Bronze Age and the Iron Age also erected them, however, and they were regarded with reverence in the British Isles well within the historic period. The early Christian teachers found it necessary to condemn what is known as "stone worship". In A.D. 452 the Council of Arles issued a decree against "infidels" who "worshipped trees, wells, or stones". The Council of Tours in A.D. 567 called upon the clergy to deal with those who did un-Christian things "at certain stones, or trees, or wells", and the Council of Toledo in A.D. 681 condemned those who "worshipped idols or venerated stones". Another Council at Toledo in A.D. 692 dealt with the same practices, while a Council at Rouen issued a decree against those who made vows at stones, &c., "as if any divinity resided there and could confer good or evil". In A.D. 789 the French Emperor Charlemagne issued a decree against the "foolish people" who worshipped "trees, stones, and wells".

King Canute, the eleventh-century King of England and

Denmark, forbade the heathenish adoration of the sun, moon, fire, wells, stones, and trees.

An old Irish-Gaelic poem states that in Ireland

There was worshipping of stones
Until the coming of Patrick.

A god of a stone circle was known in Ireland as "Crom Cruach", and the ancient poem says that St. Patrick destroyed this "feeble idol" with "a sledge-hammer". A prose manuscript states that Crom Cruach was "the King idol of Erin" and round him were "twelve idols made of stones". Human sacrifices were offered to Crom Cruach at Hallowe'en. The centre at which he was worshipped is near the village of Ballymagauran in County Cavan, and it was named "Magh Slecht", which means the "Plain of Adoration".

The old Gaelic poem referred to says of the idol of Crom Cruach:

Brave Gaels used to worship it . . .
He was their god. . . .

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

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

They did evil,
They beat their palms, they pounded their bodies,
Wailing to the demon who enslaved them,
They shed falling showers of tears.

In St. Patrick's "Confession" it is told that Ireland was

given over to the worship of "idols and other abominations", and the Irish are warned that all those "who adore the sun shall perish eternally".

The standing stones on the "Plain of Adoration" were still in existence as late as the tenth century. In Ulster there was a stone idol called "Kermend Kelstach" which was kept in the porch of the cathedral of Clogher as late as the fifteenth century.

One of the Gaelic names for certain standing stones in Ireland and Scotland is "Stones of Worship". The custom was anciently common of erecting single stones (menhirs) as "boundary stones"; these marked the boundary of an estate or tribal area and were regarded as sacred. The Romans similarly adored a boundary stone which was supposed to be entered by the spirit of the god Terminus. This god's name still survives in the English word "terminus".

Menhirs were also erected by the ancient peoples of Ireland and Scotland to mark the sites of battles and the graves of famous men. A Gaelic story collected in Skye tells of a sorceress who struck a standing stone with a magic wand. The stone was immediately transformed into a warrior. Then she struck the warrior with the wand, and he immediately became a standing stone again. Evidently it was believed that the spirit of the dead warrior had entered the stone which had been erected to his memory.

Another Gaelic story tells that a goddess named Beira, who reigned during the winter, was pursued by a young god at the beginning of summer. To escape him she turned into a grey stone which always remained moist. It was anciently believed that there was "life" or a "spirit" in a stone from which moisture oozed.

Some standing stones are pierced with holes, and there are references to vows being taken by individuals who stood at either side of such a stone, and thrust their hands into the hole and clasped them. Hollows, called "cups", in some standing stones were struck by small stones, and then an individual pressed an ear against the hollow, believing that something prophetic could be heard.

In September, 1656, the Presbytery of Dingwall met in Applecross to deal with certain "heathenish practices" which were common in the western parts of the County of Ross. The minutes tell that "future events in reference especially to life and death, in taking of journeys, was expected to be manifested by a hole of a round stone wherein they tried the entering of their head".

If men found they could put their heads into the "hole" they "expected their returning to that place, and failing, they considered it ominous".

The minutes refer also to "the adoring of wells" and "superstitious monuments and stones". There is no reference to human sacrifice, but it is stated that bulls were sacrificed on 25th August, and that oblations of milk were poured upon the hills.

Standing stones appear to have been erected in ancient times for a variety of purposes. On the south side of Great Bernera Island in the Outer Hebrides, two menhirs overlook a narrow tidal channel, and may have been known as "land-marks" with a meaning understood by the ancient mariners. A standing stone $20\frac{1}{2}$ feet high and $6\frac{1}{2}$ feet broad, with a notch at one side near the top, is situated 80 feet above the sea-level and facing the Atlantic on the west coast of Lewis. It can be seen far out at sea, and it, too, may have been a

landmark for the guidance of mariners. Seen from a distance it resembles a human hand. Its Gaelic name is "Stone of the Truiseal", but what "Truiseal" means is not known. An old Gaelic poem asks the "great Truiseal":

"Who were the peoples in thine age?"

but the stone gives a very vague answer, saying it merely "longs to follow the rest" (the ancients), and that it is fixed "on my elbow here in the west".

Although we cannot tell what peoples before the Celts erected megaliths, and why all varieties of megaliths were erected and what purposes they served, it would appear that stones were regarded as sacred because it was believed spirits entered them and influences came from them.

The earliest known use that stones were put to was in the construction of graves. In ancient Egypt the dead were, as has been told, buried in the hot, dry sand. The bodies never decayed, but became naturally mummified. When graves were lined with stone, however, the flesh vanished and the bones alone remained. The curious belief then arose that the stone ate the flesh. The Greeks appear to have acquired this belief for they called a stone coffin a "sarcophagus", which means "flesh eater".

Dr. Elliot Smith has suggested that this belief about stone "eating" flesh may have given origin to the idea that the spirit as well as the flesh of a dead person entered the stone placed at or in a tomb. The ancient Egyptians put stone statues inside royal tombs and these were shut up in a special chamber. Apparently it was believed that the spirit would enter the statue.

It may be that some ancient seafaring peoples, who adopted

the Egyptian type of ship, also imitated the burial customs of Egypt. Professor T. Eric Peet has pointed out that the megalithic monuments "lie entirely along a natural sea route".

The Egyptians were the first people who quarried and made use of stone. They erected the great pyramids, and set up tall obelisks like "Cleopatra's Needle", which was taken from Egypt in modern times, and placed on the Thames Embankment, London. This "needle" is really a menhir, and to the Egyptians it was a symbol of sun worship.

The ancient seafarers who erected dolmens, menhirs, and stone circles in Britain, France, and elsewhere had not the skill of the Egyptians in dressing and polishing stone, but they were able to transport big boulders from place to place, and to set them up as monuments. The supported stones of some dolmens weigh from twenty to sixty tons. A great deal of skill and labour was required to raise them up and place them upon their stone supports. Big menhirs weighing many tons were dragged some distance and placed erect in holes prepared for them.

Large numbers of workmen were required to erect megaliths. The people who carried out the work must have lived, like the ancient Egyptians, in organized communities, and been accustomed to obey the commands of their rulers. They could not have been mere "savages running wild in the woods".

The most famous megalithic group in the British Isles is Stonehenge in Wiltshire. It originally consisted of an outer circle of about thirty upright blocks of sandstone, a second circle of smaller stones, an inner group of great trilithons in

horse-shoe shape, and from 16 to 21½ feet high, and a further group of "blue stones" partly enclosing a big boulder called the "Altar Stone".

The sandstone blocks had been dressed, and the tops of the upright stones in the outer circle and those of the horse-shoe group of trilithons were cut so that the lintel stones laid across them might be dovetailed and held securely.



Dolmen at Plas Newydd, Anglesey

The sandstone blocks were found by the prehistoric workers lying on Salisbury plain, but the "blue stones" are not native to the district and were transported from a distance.

Stonehenge was erected not later than fourteen hundred years before the Birth of Christ. The people who erected it appear to have been in touch with the colonies of seafarers in the Mediterranean area—colonies which were, in turn, in touch with ancient Egypt and Crete. The Egyptian blue-glazed beads, already referred to, have been found in graves of the early Bronze Age at Stonehenge and elsewhere in Wiltshire, and in Dorsetshire. These beads were of a type

manufactured in Egypt between 1500 and 1250 B.C. No ancient European people could imitate "Egyptian blue".

The remains of great stone circles at Avebury in Wiltshire are very impressive. There the chief circle, which had about a hundred stones, was erected on a rampart of earth with a diameter of about 1200 feet. Inside this circle were two double circles. The stones were not, however, dressed as were those of Stonehenge.

Many other circles, and also dolmens and menhirs, are to be seen in England. Among the Scottish megaliths the most remarkable are the circles at Callernish in Lewis and Stennis in Orkney, which must have been erected by seafarers who for some reason established colonies in these outlying areas. About a mile from the Stennis stones is a remarkable ancient grave called Maeshow. It is a great mound of earth and stones about 300 feet in circumference and 36 feet high, surrounded by a trench about 40 feet wide. Inside the mound is a stone-built chamber about 15 feet square, the walls being about 13 feet high. Leading to this chamber is a low, narrow passage about 54 feet long.

A big ancient grave of similar type at New Grange, near Drogheda in Ireland, has also a long corridor leading to a stone-built chamber. Ireland has other interesting tombs and a number of stone circles.

In Brittany there are a good many passage tombs with chambers. The best known is on the island of Gavr' inis, Morbihan. Its mound is about 200 feet in diameter, and the chamber, which is about 6 feet high, is circular, and is roofed by a great block of stone measuring 13 feet by 10. The passage is 40 feet long. Other "passage tombs" are found in Spain and on the island of Sardinia, in southern Italy, at Tunis in

north Africa, and in Palestine. These tombs appear to be relics of seafaring peoples from the *Ægean* area.

Brittany is very rich in megaliths. The most famous group is the alinement near Carnac in Morbihan. Its stones spread east and west for a distance of about 3300 yards and number about 1169. At Erdeven there are 1129 stones in ten lines. There are also many imposing dolmens.

Megaliths are found in Sweden, Denmark, and north Germany, but they are not very common in Holland and Belgium. They are numerous, however, in Britain and Ireland, France and Spain, in Sardinia, Corsica, and Malta. There are a few in the south-east corner of Italy and none in Greece, but some in Bulgaria. Megaliths are found along the north coast of Africa, from Morocco to Tripoli, and in West Africa. There are some examples in the Soudan. In Asia they are found in Palestine and Syria, in Persia, in India, in the Dutch East Indies, and in Japan and Korea.

It is possible that the megaliths are relics of some ancient religious cult which was spread far and wide by seafaring peoples who came under its influence at various periods. The megaliths are not everywhere of the same age. Some were erected when Neolithic implements were in use, and others when bronze and iron implements supplanted those of stone. Religious beliefs were not, however, changed when new implements were introduced. As we have seen, stone worship had not died out in Scotland and Ireland until early Christian times.

CHAPTER XXIII

Races of Mankind

All the races living in the world to-day are classified as representatives of *Homo sapiens*, or Modern Man. They are thus distinguished from Neanderthal man who, as has been shown, became extinct during the early part of the Post-glacial period when there were still great oscillations of climate—periods of recurring cold and comparative warmth.

But Neanderthal man is not the only ancient human species of whom traces have been found. He dates far back in time, for the earliest Mousterian tools he invented are dated by some about 50,000 B.C. Of vastly greater antiquity, however, are certain fossilized skulls of human beings who lived about a million years ago. These are Java Man (*Pithecanthropus*), Piltdown Man (*Eoanthropus*), and Pekin Man (*Sinanthropus*).

Java man is represented by a "skull cap"—the upper part of the skull—which was discovered in the island of Java by the Dutch scientist, Professor Dubois; Piltdown man by fragments of a skull and a jaw-bone as related on page 13; while Pekin man is represented by a fossilized skull and jaw found in a cave in the mountains no considerable distance from Pekin, China, in consequence of the researches of Professor Davidson Black. According to Professor Elliot Smith, Pekin man was much more like Piltdown man than Java man.

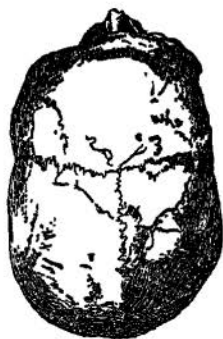
These human fossils have revealed some interesting facts. Java man's skull-cap has been used as a mould so that some-

thing might be found out regarding the shape and extent of the brain it originally contained. It has been found that that part of the brain which in Modern Man has to do with the control and understanding of speech was remarkably well developed in Java Man. We must conclude, therefore, that Java man had an articulate language. Similar experiments show that the speech faculty was shared by Piltdown man and Pekin man. The earliest known human beings could therefore converse with one another, exchange thoughts, and influence, or be influenced by, one another. Another important fact about Pekin man is that he had discovered how to make use of fire, for traces of a cave-fire are associated with his relics. He also shaped stone tools. In time other discoveries may be made which will throw further light on the character, habits and skill of primitive human beings who roamed across the continents before the great Ice Age began.

When we come to deal with Modern Man we find that his species is divided into a number of races, some being more distinctive than others. A very old method of classifying these is by using colour terms and referring to the "White man", the "Black man", the "Red man", and the "Yellow man". But there are other differences besides skin colours. We subdivide the types by taking into account the shapes of heads, the type of hair, the stature, the eye forms and so on.

In modern Europe, where the White man is most numerous, we find three outstanding types. The *Northern* fair race has a skull which is long in proportion to its breadth. This is the Dolichocephalic skull. The *Alpine* or *Armenoid* race has a Brachycephalic skull—that is, one broad in proportion to its

length, and also called "round skull". These distinctive shapes are here shown.



Long-head (Dolichocephalic) Skull



Broad-head (Brachycephalic) Skull .

Both these specimens were found in "Round" Barrows in the East Riding of Yorkshire

A third race, well represented in Europe, is the *Mediterranean* race. The skull is long, but the hair is dark, the skin sallow, and the eyes brown, while the taller long-headed

members of the Northern race have fair or light-brown hair and grey or blue eyes. It will thus be seen that although the Northern and the Mediterranean races have similar skulls, there are certain differences to distinguish them. The Mediterranean race is found well represented in Southern Spain, Southern Italy, and in North Africa. *Iberian* is a term used to refer to the Spanish branch of this race. The Alpine race is named after the Alpine area.

It appears that these three races are in the vast majority in modern Europe. One race may be more numerous in one country than another. "Crosses" or "blends" are found in all countries, the degree of blending varying greatly in different areas. A great separating influence, which has nothing to do with race, is language. Broad-heads or long-heads in different countries speak different languages and belong to different nations. The kinship of race is really not so strong as the kinship of common citizenship in a particular nation. Thus, British subjects are British patriots whether they have long-heads or broad-heads, fair hair or dark, have grey eyes or brown, or are of high, medium or short stature. We are influenced more by our sense of nationality than by our physical characters.

At the same time, our interest in the race question remains. We cannot help being inquisitive regarding the origin and behaviour of our remote ancestors who, when the great ice-sheet was retreating, entered Europe and helped to make it a continent fit to live in.

The groups of hunting people known to us as the Cro-Magnons were never numerous. Some were very tall and some comparatively short. We do not know whether or not they had fair types among them. They had one outstanding

peculiarity. As a rule, long-headed people have long faces and broad-headed people broad faces. The Cro-Magnons had long heads and broad faces. Their type is therefore referred to as "disharmonic". Their breadth of face was emphasized by their high cheek bones. Some have suggested that they were the ancestors of the Northern fair race, but the Scandinavians have rather flat cheek bones. In the ancient haunts of the Cro-Magnons in France some modern people have Cro-Magnon heads and cheek bones, but they are dark. Cro-Magnon types have also been detected in the British Isles. Some believe that those who in England, Wales, Scotland or Ireland have high cheek bones may have had Cro-Magnon ancestors.

The earliest broad-heads who entered Europe were the peoples classified as the Brunn races who made the tools called Solutrean. They appear to have come from Asia, while the Cro-Magnons came from North Africa when the Sahara was still a grassland.

After the greater part of Europe had been completely cleared of ice, larger numbers of wandering hunters arrived. The makers of the Azilian and Tardenoisian tools, who, as rock-pictures show, used bows and arrows, appear to have been early representatives of the long-headed, dark-haired and brown-eyed Mediterranean race. There also appeared around the shores of the Baltic Sea (then an inland lake) the people who made the Maglemosian tools. It is possible that, as some think, these were the ancestors of the fair Northern race. How they came to have such white skins, light-coloured eyes and fair hair remains a mystery, but, no doubt, climate was in some way responsible. When they mixed and inter-married with the darker peoples of the "White race", a pro-

portion of their descendants remained fair. Thus we find, especially in Denmark, as well as in our own country, fair individuals with broad heads instead of long heads.

The fair Northern race is best suited for a temperate climate. But in ancient times, as in modern, its members have been wanderers into warm countries. In a tomb, near a pyramid in Egypt, one of the royal ladies is depicted with blue eyes, fair hair and red cheeks. She lived during the Fourth Dynasty (about 2900 B.C.). Fair types were common in Egypt a thousand years later. In a temple at Abydos of the Nineteenth Dynasty, a generation or two after Tutankhamen, four race types are shown, and one of these is fair. There were at the time many fair individuals among the Libyans of North Africa. In our own day fair Berbers in the same area are still to be seen. The Amorites of Palestine and Syria were mixed with a fair people. King David, the psalmist, appears to have had the blood of a fair people in his veins. In the Bible it is stated that "he was ruddy and withal of a beautiful countenance, and goodly to look to" (1 *Samuel* xvi, 12). There were fair types among the ancient Greeks, and their goddess, Athene, was "grey eyed". The Achæans of the poet Homer were mainly of fair type. Many Scythians appear to have been likewise fair. On the borders of China a fair people, called the Usuns or Wu-suns, were one of the tribes against whom the Chinese protected themselves by building the great wall. Fair types are met with at the present time on the northern borders of India.

The broad-headed Alpine race has been so named because it is well represented in the area of the Alps. But it is also well represented in the plains of Russia and in the Balkans and also in Siberia and Turkestan in Asia. There are also

broad-headed types in the Dutch East Indies and among the Maori of New Zealand. The Ainus of Japan are members of the Alpine race. Some scholars use the term *Armenoid*, instead of *Alpine*, because the broad-headed type is numerous in Armenia, a country in which heads are very broad. The Alpine head is not only broad but high, the nose is prominent, face hair abundant, and the jaw is heavy. As a rule, the Alpine skeleton is robust and strong. Tallness occurs, but is less common than among the fair Northerners, the majority of Alpines being of medium height. This race shows a greater tendency to stoutness than any other in Europe.

The Mediterranean race is well named, because it is most numerous around the shores of the Mediterranean Sea. It was first given this name by Professor Sergi, the Italian anthropologist. He found that this distinctive race extended also from the mouths of the river Nile through ancient Egypt and into Somaliland and Abyssinia. Professor G. Elliot Smith has discovered that the very earliest Egyptians were of this race, and he has traced the Mediterraneans through Arabia and Mesopotamia into Persia and also into India. In Indonesia and Polynesia (the Pacific Islands) the mixture of races includes Mediterraneans and Alpines. The earlier settlers in Western Europe and the British Isles who used Neolithic tools and introduced agriculture were of the Mediterranean race. The skin of the Mediterraneans is fair, but not so white as that of the Northern race, and the brown eyes have dark irises; the face hairs are not abundant, and sometimes there is only a "chin-tuft" beard. The average stature of the men is about five feet five inches, and that of the women about five feet; the head is long and protrudes at the back, and its hair is dark brown or black. Fairly pure representatives of

the Mediterranean race are found still in parts of the British Isles; individual members of families occasionally revert to the Mediterranean racial type. When we come to deal with the relations between races, it is found that the Mediterraneans are, except in colour, nearer to the Northerners than either race is to the Alpine.

The Mongol or "Yellow" race is commonest in China, Japan, the Philippines, Formosa, Korea, Mongolia, Manchuria, and Tibet. It is also represented in Indo-China, Malaya and Burmah. Outstanding characteristics of well-depicted types of Mongols are the skin-colour, the straight coarse dark hair, broad cheek-bones, small and somewhat flattened noses, scanty face hair and "slit eyes" sloping inward towards the nose. In Central Siberia there appears to have been an early admixture of Mongol and Alpine types, the nose becoming prominent in the "half-breeds", and giving them an appearance which has been referred to as "hawk faced". Professor Elliot Smith is of opinion that the Red Indians of America are descended from representatives of this particular branch of Mongols, an early migration having taken place across the Bering Strait or by some ancient land-bridge into America.

The "Black" race is distributed widely—in Africa, India, Australia, and Melanesia (Pacific Islands). A familiar representative is the negro. Not only is he dark of skin, but his hair is distinctive. Seen under a microscope, a hair from a negro's head is found to be flat like a ribbon, which explains why it curls so tightly. In contrast, the hair of a Mongol is somewhat round, while that of the "White" man is elliptical. The negro nose is flat and broad at the nostrils, and the lips are large and coarse. In the north-east of Africa the negroes came

into touch with the Mediterranean race at an early period, and in the Sudan negroes have been mixed with the Mediterranean and Semitic peoples. It was from this area that the negroes acquired their early knowledge of agriculture and certain crafts. From the region of the Great Lakes migrated the ancestors of the more vigorous negroes, the Kaffirs, on the Gold Coast of West Africa, as well as those who reached South Africa, where they are represented by the Zulus and others. The dark negroid Pygmies (Negrittos) are found in the Belgian Congo and in the equatorial area. Other short peoples are the Bushman and Hottentots who were formerly numerous in south and south-west Africa. The Bushman peoples are now scattered in the Orange River area, but in pre-historic times were distributed to the north of their continent. Like the Hottentots, their skins are lighter than those of the Kaffir tribes, being, indeed, a tawny yellow, but, like other negroes, they have flat-fibred hair which curls in "peppercorns". The hair of the Bushman is somewhat scanty, however, and grows in tufts. As the Bushman folk are of low stature—the men from four feet six inches to four feet ten inches—they are classed as "Pygmies". Their deep-set eyes have wonderful power of vision; they can distinguish objects at a greater distance than a Kaffir or a white man. A peculiar tendency to accumulate fat in the lower part of the body is characteristic of both the Bushman and the Hottentot, and is more pronounced in women than in men. Mr. E. J. Dunn, author of *The Bushman*, says that in times of drought and scarcity of food, the accumulated fat is drawn upon, and when the supply is becoming exhausted the skin of the Bushman "hangs in folds".

It has been emphasized that various racial types are in-

cluded in a single European nation, and that similar peoples speak different languages. The languages of Europe, with the exception of Finnish, Hungarian, and Basque, are chiefly dialects of the ancient Aryan tongue. The Basque people, who live in the Pyrenees area of south-western France and northern Spain, have a distinctive non-Aryan language of which there are at least eight dialects. Their race type is mainly Mediterranean with some admixture, and it may be that they are the mixed descendants of the Azilians and survivors of the Magdalenian epoch. Whether their language survives from Palæolithic times, or came from Asia before the Aryan dialects spread through Europe, is quite uncertain.

The earliest Aryan people who spread westward were the Celts. They came from the Danube area as conquerors and as traders who salted and smoked pork and mutton and exported such food to Italy and other southern areas. Their habits of life were similar to those of the Achæans of Greece, to whom they were probably related. Greek writers describe them as tall and fair. "Their children," says one, "have generally white hair, but as they grow up it assumes the colour of their fathers' (yellow or light brown)." Evidently the Celts, like the Teutons, belonged to the Northern or Nordic fair race. Their civilization was, however, different, and they spoke a different Aryan dialect. Poseidonius, the Greek writer, tells that:

"The Iberians (of Western Europe) and the Celts had in bygone times waged a war of long duration for the land; but at length they entered into an alliance and held the country in common. Marriage alliances effected a fusion of the two peoples. It was because of this intermixing that they are said to have received the name of Celtiberians."

Here, then, we have a tall fair people intermarrying with dark stock of medium stature. The Celts and Celtiberians spread into the British Isles, introducing the use of iron. The islanders were in the Bronze Age when these intruders came as conquerors and formed military aristocracies. There were petty states and petty kings in ancient Britain when Julius Cæsar first crossed the English Channel in 55 B.C. About a century later the Roman conquest took place, and for some four hundred years the country we now know as England was part of the Roman Empire. The number of Italians who settled in the England of Roman times was never, however, very great. In the army of occupation were Romanized Gauls from France, Romanized Spaniards from Iberia, and Romanized Teutons from Germany. Army officers and officials were drawn from various parts of the Roman Empire. In the fourth century the Roman general in command of the forces occupying Hadrian's Wall in northern England had the non-Roman name of Fullofaudes. The Picts and Scots in A.D. 368 captured the forts of the Wall and swarmed into England. The Roman general who was sent from the Continent to drive them north was a Spaniard named Theodosius, and his army was composed of regiments recruited in France and Spain.

After the Roman period large numbers of Teutons invaded England. These included the Angles, the Saxons, and the Jutes. They gradually conquered the greater part of the territories of the Romanized Celts, but it was not until the latter part of the sixth century and the early part of the seventh that the Teutonic power reached western England. The conquests of the Angles and Saxons were thus very gradual, extending over about two hundred years. In the eleventh century the Danes, who had been for about three centuries

raiding in England, conquered the whole country, but did not hold it for more than a quarter of a century.

It is no longer believed that each invasion of Britain brought about the extermination of the natives. After the Celts and Celtiberians arrived they became politically powerful, but the Bronze Age peoples survived. In Roman times native Britons were protected by Roman law and the great majority were Romanized. They became Roman citizens and spoke the Latin language. The Welsh dialect of the old British Celtic language continued to be spoken in the west. In the post-Roman period the invading Angles and Saxons became the aristocrats, and in the course of time freely intermarried with the natives, as did the Celts with the Iberians in Western Europe. The Danes and other Scandinavians similarly fused with the people whom they subdued. A final conquest was achieved by the Normans, who were mainly of northern stock—Norwegians and Danes—but were accompanied also by fighting men from Brittany and northern Germany.

It does not follow that when an invasion took place the conquered people were completely dispossessed or exterminated. Professor Broca, the French anthropologist, dealing with Roman invasions, says that the conquerors "beheaded a score or two of the leading men and called it exterminating a tribe". We find Bede (672-735), the "Father of English Historians", writing regarding the conquests of Ethelfrid (593-617), the Anglian King of Northumbria, as follows:

"He conquered more territories from the Britons, either making them tributary, or driving the inhabitants clean out, and planting English in their places, than any other King or tribune."

The Romans acted similarly. After the rising under Boadicea (Boudicca) was suppressed in the first century of our era, the

area we now know as Norfolk suffered terribly. Men, women, and children were slain, and farm-houses and crops set on fire. A famine followed, and many of the survivors died of hunger. But the area was later repopled by other Britons. William the Conqueror was so enraged against the people who rose against him in northern England that he devastated the county of Durham and a great part of Northumberland. It appears that large areas were "entirely ravaged", but other areas were spared. Some of those who fled for refuge to other parts no doubt returned later. Chester, Derbyshire, Staffordshire, and Shropshire also suffered heavily at the hands of the Conqueror who, like the ancient Romans, sometimes "made a desolation and called it peace".

Present-day evidence shows, however, that in England and Scotland the descendants of the peoples who were the earliest inhabitants still survive. Anthropologists have found, indeed, that among the living population may be seen (more numerous in some areas than in others) the long-headed dark people of short stature whose ancestors were agriculturists in Neolithic times, broad-headed representatives of the Bronze Age as well as representatives of the Celts and Anglo-Saxons and Jutes. Similar survivals are found in other parts of Europe. "When," writes Dr. Collignon, the French anthropologist, in this connexion, "a race is well seated in a region, fixed to the soil by agriculture, acclimatized by natural selection and sufficiently dense, it opposes, for the most precise observations confirm it, an enormous resistance to absorption by the newcomers, whoever they may be."

Changes of language and changes of rulers do not necessarily entail changes of race.

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