PART II

PAPERS, ETC.

Archaeology and Food

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ARCHÆOLOGICAL investigations have thrown much light on the long road along which man evolved from the ancestral stem from which also the monkeys have developed. We meet first with a definitely human type at the end of the Pliocene Geological period. A brief statement of these classification terms may be helpful to those unfamiliar with them, as the terms are so many and used for three different purposes. The various deposits of bones, weapons, etc., are dated in terms of the geological strata in which they are found, Pliocene, Pleistocene and the like. A second group of terms is used to refer to the types of man which have been unearthed, and these are called by the names of the places where the bones are found. Well-known names are Neanderthal man, Piltdown man, Cro-Magnon man. The third group of terms refer to the stages of culture reached. Broadly used they include Palæolithic, Neolithic, Bronze Age and Iron Age. These broad groups are again divided into many cultural groups. This is particularly the case for the Palæolithic period, and we have such terms as Chellean, Mousterian, Aurignacian, based mainly on the types of flint instruments. It has been possible to take this a stage further and to co-ordinate, in many instances, the stage of culture reached with the type of men who used these tools.

Fortunately for this address I can adopt a simple grouping of culture periods into five Ages.

(*a*) A Pre-Palæolithic Age covering the extremely long period during which man was shedding most of his simian

characteristics and developing into a definitely human type. Experts differ as to its duration, but it would appear to be at least as long as a quarter of a million years.

(*b*) The Palæolithic Age—the so-called old Stone Age—which was also very long, probably at least 200,000 years in the main centres, but lingering on in backwaters to the present day.

(*c*) The Neolithic Period, or new Stone Age, with polished flint weapons and definite civilization culture. In its main centres it lasted only a few thousand years.

(*d*) The Bronze Age, which was really a continuation of the Neolithic Age, but with better weapons and other articles, from which it gradually shaded off. This also lasted a comparatively short time, measured only as a few thousand years.

(*e*) The Iron Age, again shading off from the Bronze Age and developing at different times in different places.

I propose to discuss food conditions over the four first periods.

Pre-Palæolithic Age

Evidence as to man's food in the long Pre-Palæolithic Age is naturally scanty, for our only data are some skeletal remains and a few exceedingly primitive flints. Three sets of bones, including skulls, can definitely be regarded as belonging to this age, i.e. *Pithecanthropus* (the Java man), *Eonanthropus* (the Piltdown Man of the Sussex Downs), and *Sinanthropus* (the Peking man). These skulls show definite intermediate characters between the simian and the modern human skull, special features being the very small and poorly developed brain, the thick skull bones and intermediate teeth.

In the gorilla the canine teeth develop early and are weapons of offence. They have extremely long roots, are very pointed, and project like a tusk far beyond the level of the other teeth, and make a break in the orderly sequence of the teeth. In the Piltdown skull we get some of these simian features, for the canines are large, pointed and a little projecting, but otherwise they have lost much of their specialization and come in orderly sequence between the incisors and premolars. The tooth was found very well worn and obviously was used for heavy mastication of hard food and not for offence. *Pithecan-*

thropus had large strong molar teeth but more of the human type than Piltdown.

We also get an idea of usage by the comparative ratio between the area of the palate and the area of the brain. In modern Englishmen [1] it is 1 : 56, in modern natives 1 : 37, in the chimpanzee 1 : 8, and in *Eoanthropus* 1 : 24. A large palate suggests a crude and a not highly nutritious diet.

Over this very long period progress was very slow in food habits, as in everything else. Man ate anything he could get hold of and used sticks, stones and later shaped stones as aids to kill animals. He ate his food raw and chewed it well, giving up teeth as weapons of offence. These habits resulted in a general reduction in the size of the jaws and the heavy face bones, with a progressive increase in the size of the brain as his hands developed and his mental processes quickened.

The Palæolithic Age

In the Old Stone Age the material available is considerable, and it is possible to formulate fairly clear ideas as to how these people lived and the food they ate. They are comparable to some existing savage races. Over this very long period any remaining simian characteristics were shed, but we can now no longer accept the view that there was a progressive and orderly sequence of evolution. For example, during the Middle Palæolithic period much of Europe was occupied by Neanderthal man, a brutal type with many simian characteristics sufficient to exclude him from the direct line of *Homo sapiens*.

One of the earliest cultural types, the Chellean, shows rough flint tools such as hand-axes, borers, scrapers, hammer-stones, and probably wood and bone tools. The men of this culture had considerable aids to procuring a food supply; as we progress in time we find a general improvement in tools and weapons. These include in the Upper Palæolithic period new types such as spears, assegais, assegai-throwers, bows and arrows, and towards the end of the period harpoons. All tools and weapons are now much better made and finished.

Over the whole of this enormous period of time man's mode

[1] Sir Arthur Keith, *The Antiquity of Man*, 1915, p. 329.

of life was along certain definite lines. He lived in small communities and many were cave-dwellers. These people had no growing crops of cereals and no true domestication of animals, even in the later stages, i.e. no breeding from captivity. They used fire, and while they may have thrust meat into the fire they had no cooking as we understand the term ; indeed they had no pottery in which to do cooking. Their food was the products of the chase—fish, wild fruits, grubs, shellfish, wild honey. It varied somewhat with the climate and with racial habits. In the kitchen-midden culture along various parts of the Baltic the mounds consist almost entirely of shellfish, but these were mainly Early Neolithic period. The only trace of any settled industry is late in the Old Stone Age and in Aurignacian culture (Cro-Magnon man) fishing developed as a regular feature of their food supply, and we get fish harpoons of superior type.

Considering the vast duration of the Palæolithic period and the considerable brain development, it is astonishing that progress was so slow and so comparatively slight. Progress of course there was, as is clear from a comparison between the tools of the early and late cultures, while methods for snaring or killing their food supply were materially improved, but they all were improvements in degree, not in kind. We must agree with Professor Elliot Smith [1] when he writes : ' There is no innate tendency in man to be progressive. To the untutored savage most of the elements of our civilization are uninteresting, unattractive and irrelevant. Not only has he no impulse to devise such things, but he fails to take any interest in many of them even when they are presented to him ready made.'

Never throughout the long Old Stone Age did man win one of the four freedoms we talk about—freedom from want. Never did he have a secure food supply. Food, day in and day out, was man's predominant quest, and the fear of starvation was always just round the corner. He had no means of preserving meat food, except possibly by sun drying, no flocks to eat as a standby, no growing crops to cheer his eyes. He lived from hand to mouth and sometimes the interval between the hand and the mouth was long or failed altogether. Orgies

[1] G. Elliot Smith, *The Evolution of Man*, 1924.

of gross overfeeding must have alternated with belt tightening. He could never form more than part of a small community because the hunter who lives on the chase requires a very large area per man to yield enough food.

The great changes in food economy came in the Neolithic period and constitute a fundamental revolution in ways of life as well as in food habits. Before we consider these changes there is an interesting problem to mention. The Palæolithic Age lasted in Europe, in Palestine and elsewhere up to some 10,000 years B.C., and beyond that we come across no later finds. The very oldest settled communities, at Susa, Sumeria, at Ur and elsewhere, the pre-dynastic Egyptian and in the Indus Valley, all show evidence of real civilization, with developed agriculture, domesticated herds, fine pottery, and the use of copper. The more extensively these deposits are investigated the clearer is the evidence of a well-developed Neolithic economy. The deposits go back at least to 5,000 to 6,000 B.C., and possibly even earlier. If these calculations of experts are right, it leaves a mere 4,000 years or so between the cave culture and methods of life of Old Stone Age man and a highly developed Neolithic civilization. The changes are fundamental, the time interval comparatively short, but when and how these fundamental changes occurred we do not know yet; some probably we shall never know.

The Neolithic Age

The fundamental revolution in habits and mode of life to which I have referred showed four essential changes, i.e. domestication of animals, a definite agricultural economy, making of pottery and cooking of food, and elaboration of much better tools, using a grinding and polishing technique.

While we can learn something from the earliest Egyptians and Sumerians our best sources of information are from the lake villages of Switzerland, North Italy and parts of Germany. The early settlements are Neolithic and they pass into the Bronze Age without any recognizable breaks. Their weapons and habits appear to have been very similar in type to those of the natives of New Zealand as described by Captain Cook in 1770.

The animals domesticated were dogs, cows, sheep, goats and

pigs, mostly smaller varieties than those of to-day.[1] The cattle were regularly stalled in the actual pile-dwellings on the lakes. The cereals grown were two varieties each of barley, wheat and millet. We only meet with oats in the Bronze Age, and rye was unknown to these lake-dwellers. They were all spring-planting types, so they must have prepared and planted their fields in the spring only. Bread was made from wheat and millet, barley being eaten boiled or toasted. In nearly every settlement are found corn-crushers and mealing-stones to crush and grind the cereals. According to Professor Heer (see Keller's book) much of the grain was roasted and crushed and then put in a pipkin and soaked and eaten as corn meal. This was probably the earliest form of grain usage and we know that Jason and also Telemachus, in the Bronze Age, carried their grain as meal.

The only garden vegetable cultivated was peas, and the dwarf field bean only appears in the Bronze Age. They made up for this by collecting many wild fruits and berries, i.e. apples, crab apples, pears (rare), sloes, bird cherries, plums, raspberries, blackberries, bilberries and grapes (in Italy). Beechnuts are found abundantly, and it is thought they were used for oil extraction. Flax was grown for clothing. Other main sources of food were the flesh of wild animals, fish, milk and almost certainly wild honey. I can find no evidence of bee-keeping until Bronze Age times, when there are many references. In these days of sugar abundance it is difficult to realize that sugar is a comparatively recent introduction. Even in the fourteenth century it was sold among the ' spices ' and fetched about 10*s*. a pound in our money.

Honey was the only available source of pure sugar in ancient times and was in great demand. It is not for nothing that the perpetually murmuring Israelites had to be constantly stimulated to further endeavours by the enticements of ' a land flowing with milk and honey '.

While eggs of wild birds were no doubt eaten there are no bones of domestic fowls. They seem to have been spared from depredation by mice and rats, as no bones are found of these

[1] I am indebted for much of this information to Keller's valuable work *The Lake Dwellings of Switzerland*, 1878, and for some facts to Munro, *Lake Dwellings of Europe*, 1890.

animals or of domestic cats. There is much hand-made pottery, and that suitable vessels were used for cooking is evident from the fact that the outsides are covered with soot.

I cannot find any clear evidence as to butter and cheese, and no vessel definite enough to be taken for a churn. When milk goes sour and curdles the solids form a sort of soft cheese, so probably they had a simple form of cheese.

Bronze Age

The introduction of bronze for weapons and other purposes did not cause any fundamental changes in food economy, but there was a gradual improvement in methods and an extension of foods utilized. We get increased breeds of sheep and cattle, the horse is domesticated, fodder is improved. The effectiveness of the plough is increased, more cereals are introduced, i.e. oats and rye, while both summer and winter wheat is used. Better vessels are used for cooking and bread-making. Saddle and rotary querns appear in the later Bronze Age (incidentally they are abundant in the Iron Age Glastonbury and Meare Lake Villages). The proportion of wild animals to domestic animals eaten steadily diminishes in the lake villages as they pass into the Bronze Age.

When the Bronze Age settlements pass into the complex and highly civilized empires of Egypt, Crete, Greece, Sumeria and Babylon, we get abundant sources of food supply and an ample life. We must not, however, conclude, from the considerable magnificence of these ancient empires that the types of food economy are the same as our own, that their food supply was always assured and needed little special effort. Probably the opposite was the general position in all these countries, except possibly Crete.

In the first place the quality of agriculture was vastly inferior to our own. The Neolithic plough was a sharp stick or antler-horn which merely cut a little trench, and in the Bronze Age it was not much better. In Great Britain in Roman times the plough was a simple hand affair which scratched the soil without turning a sod. The Belgæ did introduce the heavy plough with a vertical knife in front of the share to cut the soil in preparation for turning a sod, but this

was uncommon until the Anglo-Saxons came. In practice, therefore, only light soils could be ploughed.

The animals were smaller and milk yields from cows much lower.

Things were better in Egypt and Mesopotamia, but only at the price of eternal vigilance, and as early as the 1st Dynasty the ' Manager of the inundation ' ranked very high amongst Egyptian officials. Even then famine was not unknown, and it will be recollected that Joseph, a foreigner, rose to the highest position by predicting and controlling a famine.

The fundamental importance of food is indicated by the fact that almost invariably all the gods of these times were essentially fertility gods and godesses—fertility of the body and of the soil. Demeter and Persephone, Osiris and Isis, the Eastern Diana, Baal and the like are all in their primary conception corn and fertility deities, and special sacrifices to ensure soil fertility are commonplaces.

In actual fact many areas, outside the two fortunate irrigation districts, could not grow enough food for their needs and imports of food were vital. As now, Greece in the Bronze Age had to import part of its corn. The precipitating cause of the Siege of Troy (sacked 1183 B.C.) may have been ' the face that launched a thousand ships ', but the underlying cause was probably that so much of the corn of Greece had to come from the shores of the Black Sea, and the Greeks resented that Troy could bar it altogether and invariably took toll as it passed. For these various reasons we cannot regard the food supply in Bronze Age times as secure.

I have tried to build up a picture of the food habits of the men and women of these ancient times. To complete the picture I should like to say a little from the medical side as to the probable quality of the food, and any evidence as to ill-health and poisoning from food in these remote times.

Food Quality and Food Balance

Whatever its shortages the food of the men of the Old Stone Age was probably not deficient in any essential food components. The protein would be higher and the carbohydrates lower than in a modern diet.

When we turn to the Neolithic and Bronze Age periods, with

its more regular and settled food control, we cannot be so sure. In the large settled communities of the Tigris, Euphrates and Nile Valleys, I think the very abundance and ease of cereal production must have brought in its trail some of the errors of food balance from which we are prone to suffer. Milk would be much less consumed and animal meat from the chase would be almost excluded from the food of the masses. The carbohydrate cereals stay the pangs of hunger but are inadequate alone, and there would be much calcium and some vitamin deficiencies, especially in the children. It is a commonplace of history for these settled communities to be overcome and subdued by foes (usually nomadic) vastly inferior in numbers but hardier. This is usually ascribed to the debilitating effect of the settled life without any effort to explain the cause of this ' softness '. One important factor, I believe, is the better balanced diet of the nomad and the high proportion of protein and other essential food components.

In the old bad days of the early Boards of Guardians the diet deliberately kept the paupers lowly and in their places. Even Bumble had some flickerings of physiological knowledge when he at once ascribed the unexpected ebullition of physical vigour and fearlessness on the part of little Oliver Twist not to madness but to *meat*.

> ' Meat, ma'am meat, replied Bumble, with stern emphasis. You've over-fed him ma'am. You've raised an artificial soul and spirit in him, ma'am, unbecoming a person of his condition : as the board will tell you. . . . If you had kept the boy on gruel, ma'am, this would never have happened.'

I know of few references in Bronze Age literature which deal with the quality of the food eaten. Aphrodite reared the little daughters of Pandareus upon cheese, honey and wine, while Homer mentions that the infant son of Hector ' on the knees of his father ate only marrow and the rich fat of sheep ', a diet which would have killed the babe in a few weeks. These are, however, poetic utterances and intended to tell us that they were fed on the best food, just as we now say ' lived on the fat of the land '.

It is, however, most interesting that marrow is included as a best food. Interesting because you cannot examine any

Palæolithic collection of bones without finding that all the long-bones have been split and the marrow extracted. We get the same thing in the Neolithic Age. With their imperfect instruments this extraction was not at all easy and one wonders why they did it so regularly. It is possible, but unlikely in Neolithic times, that they were so short of food that no source could be neglected. It may be because they regarded it as a delicacy and they would agree with Marie Lloyd's song of my student days, 'A little of what you fancy does you good'. A third possibility is that they ascribed some special qualities, such as strength and courage, to the marrow, and it was almost ritual to eat it. The quotation from Homer gives some support of this possibility.

Illness and Poisoning from Food

Naturally our information is very scanty, but we have a few facts. From our knowledge of existing savage races still living in the Palæolithic period we can be reasonably certain that a high proportion of humans in the Palæolithic Age suffered from intestinal parasites, and this would be one factor in the short duration of life. Only when cooking of food became the normal practice and there were higher standards of personal cleanliness would these infestations be checked.

There are many poisonous fruits, mushrooms, fish, etc., and at first all would be eaten by Palæolithic races, until by a process of trial and error they learned the foods which could not be eaten with impunity. Probably they would be made taboo and so their usage prevented. The individuals who evolved into 'medicine men' would no doubt carefully note them, and in the seclusion of the mystery within which they surrounded themselves, prepare subtle poisons to use on their enemies.

Poisoning from rye, contaminated with the ergot parasite, was very prevalent right through the Middle Ages, but I do not think that there are any clear evidences in Neolithic and Bronze Age times.

The teeth of all the Palæolithic skulls show no signs of dental caries. They are mostly extensively worn from the hard usage, but never any caries. Only when we come to Neolithic times, when well-established with large settled communities and a

high proportion of carbohydrate as the staple food, do we find dental caries.

There are few references to food poisoning in Bronze Age literature. Deuteronomy (Chap. xiv) has one interesting reference where it lays down the prohibition ' ye shall not eat of anything that dieth of itself '. Right up to the present day there have been many outbreaks of food poisoning in Europe due to eating animals which have died or been killed first before death and passed for food by the veterinary inspectors. Rare in England they are still common in Germany, and any book or scientific report on food poisoning in that country mentions cattle ' notgeschlachleten ' as the cause of many outbreaks. This injunction does suggest knowledge that disease might be conveyed that way. Unfortunately there is also a gross relapse from sound ethical standards, for the whole verse reads: ' Ye shall not eat of anything that dieth of itself ; thou shalt give it unto the stranger that is in thy gate, that he may eat it, or thou mayest sell it unto an alien.'

We need not be too hard, however, on the Hebrews, since as late as 1386 a Scotch Act of Parliament enacted that decomposed pork or salmon should be condemned and also enacted that it should be given to ' the poor leper folk '.

I have been able to find only one record of a food poisoning outbreak in Bronze Age times. That took place during the prolonged march of the Israelites from Egypt to the Promised land. Whichever of the three dates advanced we select, undoubtedly it was in Bronze Age times, probably 1300–1400 B.C. We have recorded what Sherlock Holmes would doubtless call ' the remarkable episode of the quails '. Marching along the coast near Hazeroth (the modern Hazira), quails in great abundance flew in from the sea and the Israelites gathered them in great numbers. As Numbers (Chap. xi) states, ' and while the flesh was yet between their teeth, ere it was chewed, the wrath of the Lord was kindled against the people and the Lord smote the people with a very great plague ', and as Psalms tell us, ' slew the fattest of them and smote down the chosen men of Israel '.

As Jarvis points out,[1] at the present time there is a regular spring and autumn migration of quails. In the autumn the

[1] C. S. Jarvis, *Yesterday and To-day in Sinai*, 1938.

birds come direct from the cornfields of Hungary, Roumania and Russia, and at this season are very good to eat. The spring migration is from Central Africa, and they arrive tired and emaciated and they feed greedily on whatever they can find and often eat many poisonous plants, such as hemlock. In our own time [1] there have been a number of cases of food poisoning from eating these poisonous quails, and the Algerian sportsman carefully avoids eating the spring migrating quail. Dogs fed with quails which have been fed with the hemlock plant suffer from hemlock poisoning.

We can picture the famished Israelites collecting the tired weary quails, and then soon after eating them being attacked with hemlock poisoning. Unfortunately the symptoms are not mentioned, but the contained alkaloid *conine* is very poisonous. The interval between consumption and the onset of symptoms is quite short and compatible with the delightful expression in the Book of Psalms, ' while the meat was yet in their mouths ', and the whole account fits in with hemlock poisoning.

Of course it is described as due to the wrath of the Lord, but that is common form, and right up to modern times every epidemic and food disaster is ascribed as a punishment by an angry deity. This is a rational and probable explanation of the only record of an outbreak of food poisoning I have come across in any literature in this period, and it is interesting to think of these Bronze Age Israelites being poisoned by the same alkaloid as that by which Socrates met his death (399 B.C.) some 900 to 1,000 years subsequently.

[1] E. Sergent, *Arch. Inst. Pasteur d'Algérie*, 1941, xix p. 161.