THE SOUTHEAST ANATOLIAN PREHISTORIC PROJECT AND ITS SIGNIFICANCE FOR CULTURE HISTORY[1]

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When we look back upon man's long past, the following question occurs: how and by what processes has this being, which we call man, come to be what he is to-day? It is only through a long and gradual process of many hundreds of thousand years, subsequent to a long biological evolution, that this living organism called Man has become man in the modern, cultural sense of the word. This means that, in the life-time of man as a species, an evolution in the cultural sense of the word has been added to the biological one: the transition from a man-like being to one that can truely be called man, the emergence of cultural elements juxtaposed to the biological ones and in time gaining in importance; that is what we here, to-day, mean by culture history.

For the prehistorian the initial process of becoming man is generally associated with tool-making. The hunter and gatherer, who could maintain life merely through the consumption of plant and animal products existing readily in nature, did, during the earliest phases called the Lower and Middle Palaeolithic period, initially only manufacture tools for direct use. It is only at the end of hundreds of thousands of years, when a more developed stage of increasingly organised and intensive hunting and collection was reached, during what is termed the Upper Palaeolithic period, that he became able by a technological advance of tremendous importance to produce "tool-making tools". However, his way of life as a hunter, fisher and collector, characteristic of the glacial and pluvial phases of the

[1] This paper is based on a lecture given at the Turkish Historical Society, Atatürk Lecture Series, in the spring of 1970 and reports on the state of things at that time (cf. H. Çambel, "Güneydoğu Anadolu Tarihöncesi Araştırmalarının Kültür Tarihi Bakımından Önemi", *Atatürk Konferansları* IV, 1970, Ankara, 1971, p. 22-40, fig. 1-32.

pleistocene, continued well into the holocene or neothermal period, subsequent to the withdrawal of the ice-sheets.

During all this long span of time, which comprises the greatest part of his life as a species, and has lasted, according to present knowledge, from nearly two million years ago to about 10-11 000 years ago, man has been non-productive economically; he was a parasite, a consumer.

The move from a non-productive, consumer economy to an economy based on production did not take place until the neothermal period, in the course of what has been termed the "Neolithic Revolution". This occurred in certain regions of our world, within or adjacent to the natural habitat of potential domesticates, plant and/or animal, where conditions of climate, soil, rainfall etc. were propitious to this move and where the traditional accumulation of human knowledge and technological skill had reached a certain level of proficiency.

With progressing cultural evolution man began to intrude upon the heretofore untouched physical world, subject until then to the laws of nature only. Thus, through human labor his natural environment began to be turned into what in German is called *Kulturlandschaft*. Man, who in this manner began to change the face of the earth as well as his own way of life, thus, as a species, started out on the way to becoming the master of his own destiny.

Through this step forward it became possible, economically, to produce, within a certain span of time, more than was consumed and the rate of human progress, due to an economy based on production, acquired an ever increasing speed, which in our times has reached astronomical proportions. If we compare human achievements of the only 10-11 000 years of productive economy to those of the nearly two million years of non-productive economy preceding them, the driving force and caliber of the former becomes clearly apparent.

The roots of most of the main economic, social and cultural institutions of our times, considered beneficial or injurious, praised or deplored, supported or attacked are hidden in what is generally thought of as a far-off, long dead past: the move from a non-productive to a productive economy. This is why the search for knowledge about this step is one of the most fascinating problems of our day and of utmost importance for our era, where all socio-economic institutions are being challenged and our society is being deeply agitated and uprooted.

The emergence of the possibility of accumulating the products of human labor; the increase in population following the appearance of food-production and the consequent increase in food-stuffs; the filling of all parts of the world with humans; the concepts and knowledge of land-use, planning, budgeting, the family, private property, the growth of arts and crafts by increasing division of labor; the birth of trade as a forerunner of commerce, which in our days rules the economy of so many countries and communities; social differentiation and the emergence of classes with all the consequences thereof; the genetic evolution of animal and plant species upon which the main food economy of modern civilisation is based; and so many other developments: these are all consequences of this move, the change from a non-productive to a productive economy. There is no doubt that, without investigating or discovering the mechanism of this change in man's history, the problems of our yesterday, of our to-day and of our to-morrow cannot be clearly understood or properly evaluated.

When, then, did this move take place initially and where? The most important and –according to present-day knowledge– oldest center where this came about is doubtlessly the Near East, an area of natural distribution of potentially domesticable species, both plant and animal, and one from where the art husbandry, once established, spread to other parts in Asia, Europe and Africa.

The domesticable species in question are –besides legumes– the wild forms of what still in our modern times constitute the major basic food sources of human societies, mainly wheat, barley, goat, cattle and pig. The natural distribution of the wild forms of these species[2] provides important clues for the knowledge not only of their natural habitat zones but also of the regions potentially favorable for the step forward to production.

From among the wheats it is the small-grained wild *Triticum boeticum*, capable of surviving in cold climatic conditions and on poor

[2] Jack Harlan and Daniel Zohary, "Distribution of Wild Wheats and Barley", *Science* 153, 1966, p. 1074-1080, fig. 1, 3, 4; Sonia Cole, *The Neolithic Revolution*, London, 1961, fig. 13, 15-17.

soils, that by gene mutation has given rise to *Triticum monoccocum* or *einkorn* [3], while the large-grained *Triticum dicoccoides* has given rise to the domestic and more valuable food crop, *Triticum dicoccum* or *emmer*. The wild *Hordeum spontaneum* gave rise to the domestic species of barley.

It has been hypothesized [4] that conditions favorable to an initial, primitive and dry form of agriculture would prevail within this area, in zones that were open to the south, had an elevation of approximately 700-1000 m. above sea-level, an annual rainfall not falling below a certain limit, as well as abundant spring rains and sparse winter frosts. It was thus believed that the earliest forms of agriculture were developed in the hilly flanks (the upper piedmont and intermontane valleys looking south, southeast and southwest) located above and beyond the fertile plains of J. H. Breasted's *fertile crescent*. This last was arable only through irrigation and was where the great urban civilisations, such as the Sumerian, came to be developed. Research carried out in these hilly zones, that is, on the western slopes of the Zagros and the eastern slopes of the Syrian-Palestinian mountains, disclosed seasonal, perhaps annual, settlements pertaining to the final stages of food-gathering as well as sites with clues to incipient domestication and early villages with primitive forms of plant and animal husbandry (fig. 1).

However, the region comprising the southern flanks of the Taurus which constitutes, as it were, the keystone to this area had not been explored and its role within this phase of human cultural history had not been elucidated.

It would obviously have been inadequate to try to achieve such an exploration through one-track research, staying within the limits of

[3] This species is still cultivated to-day on the impoverished soils of Turkish Thrace and in the Region of the Sea of Marmara for animal fodder and is known as "kaplıca" in Turkish.

[4] Robert J. Braidwood, Bruce Howe *et al. Prehistoric Investigations in Iraqi Kurdistan* (Studies in Ancient Oriental Civilisation No. 31), Chicago, 1960; R. J. Braidwood and Bruce Howe, "Southwestern Asia Beyond the Lands of the Mediterranean Littoral" in *Courses Toward Urban Life* (R. J. Braidwood and G. R. Willy eds.), Chicago, 1962; R. J. Braidwood, "The Earliest Village Communities in Southwestern Asia Reconsidered", *Atti del IV Congresso Internazionale della Scienza Prehistoriche e Protohistoriche, I*, Roma, 1962, p. 115-126.

archaeological methods, since the evidence derived through these is largely indirect and indefinite and clearly insufficient for the solution of the problems envisaged here. Thus the existence of such archaeological evidence as, for example, pick - or hoe-like tools, sickles, edge-sheen [5], grinding stones or female figurines considered to be associated whit fertility magic are by no means sufficient evidence for the existence of food-production, They may all equally well pertain to activities associated with a non-productive, consumer economy of communities still at the stage of intensive food-collection.

It was for such reasons and in order to elucidate this problem-complex with regard to this foothill zone in Turkey that a long-term, multi-lateral interdisciplinary research project was organised in 1963. This was established in conjunction with Professor Dr. Robert J. Braidwood [6] of the Oriental Institute of the University of Chicago and is known as the *Istanbul and Chicago Universities Joint Prehistoric Research Project in Southeastern Anatolia*. We should at this point express our thanks to His Excellency İsmet İnönü, Prime Minister of Turkey at that time, for having made possible the realisation of this project under the difficult circumstances of the day.

The first in the Joint Prehistoric Project was a surface survey in as large a foothill area as possible within the provinces of Siirt, Diyarbakır and Urfa. On the one hand, the geographical and climatic conditions, plant relicts possibly pointing to the former forest cover, lake bottoms and marshes apt to provide pollen series, as well as wild animal populations and flint and obsidian sources were investigated. On the other, camp - and settlement sites in districts with favorable soil and water conditions were also investigated and materials collected. It goes without saying that it has been possible to cover only very limited sections of this region which comprises approximately 46 000 km^2.

[5] E. C. Curven, "Prehistoric Flint Sickles", *Antiquity* IV, 1930, p, 179-186 and "Agriculture and the Flint Sickle in Palestine", *Antiquity* IX, 1935, p. 62-66; J. Witthoft, "Glazed Polish on Flint Tools", *American Antiquity* 32, 1967, p. 383-388.

[6] Robert J. Braidwood is the first and main propounder and organiser of field research into the problems of the origins of food-production in collaboration with a team of natural scientists and the instigator of a whole generation of archaeologists seconded by natural scientists who have gone into this field of studies.

Before going into the purely archaeological part of the work, let us dwell on the part associated with the natural sciences and, more particularly, on the floral evidence. One of the premises was the dependence of plant assemblages on definite climatic conditions for their existence and the resultant possibility of identifying associated climatic series up to 40 000 years ago through pollen analysis. This not only has a bearing on the knowledge of the geomorphology and palaeoclimatology of the area involved, but is also relevant to the knowledge of the palaeoenvironmental conditions under which prehistoric man lived in the area.

After preliminary work at Gölbaşı near Bozova (province of Urfa), a long range pollen, or palynological, research program was drawn up, and the collaboration of the Mining Research and Exploration Institute (MTA) was obtained. The hope was that through palynological studies at lakes - particularly those in the high mountains in eastern Anatolia [7] - it would be possible to obtain an uninterrupted pollen and, therefore, climatic series ranging from the end of the last glaciation up to our days, of the sort that is available for other parts of the Near East, Northern Europe and North America.

Aside from the environmental research, great importance was also attached to the retrieving of plant remains from locations that were being excavated; and flotation [8] was used here for the first time in Turkey. Through this flotation method as well as through the examination of remnants of wall plaster, baked or unbaked brick etc. for plant impressions, it has been possible to retrieve valuable inform-

[7] The most favorable lakes for this type of research are those with a deposit of clay and marl and without much sand or gravel that have been formed within the glaciated districts and morainal remains in high mountains and that have held water since the end of the last glaciation.

[8] This method for retrieving plant remains from the soil during excavation was first developed by Stuart Struever in the U. S. A. (cf. S. Struever, "Flotation Techniques for the Recovery of Small-Scale Archaeological Remains", *Paper Presented at the Annual Meeting of the Society for American Archaeology*, Ann Arbor, 1967). The method is based on the principle that plant remains are light enough to float in water and, so, become separated from all the heavier remainder of natural or archaeological deposits. In Turkey it has later also been practiced by the teams of the Keban Salvage Project at Korucu Tepe, Tepecik and Aşvan and a graded apparatus was developed by David French at Canhasan to retrieve even the minutest particles of plant remains.

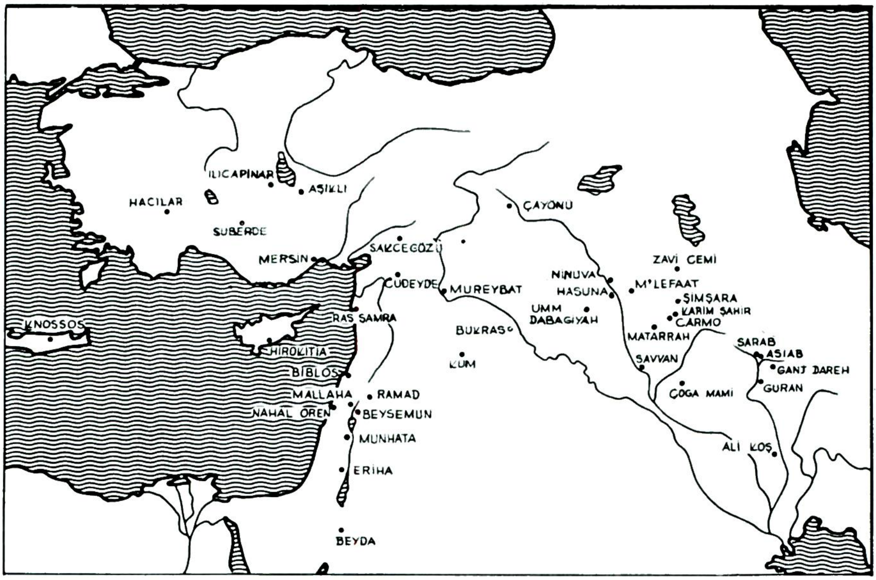


Fig. 1 — A selection of open settlements which fall at one phase or another in the range from intensive food-collection through putative incipience to effective food-production in pre-Halafian times.

Fig. 2 — Wild wheat (tall) growing on edge of domestic wheat field.

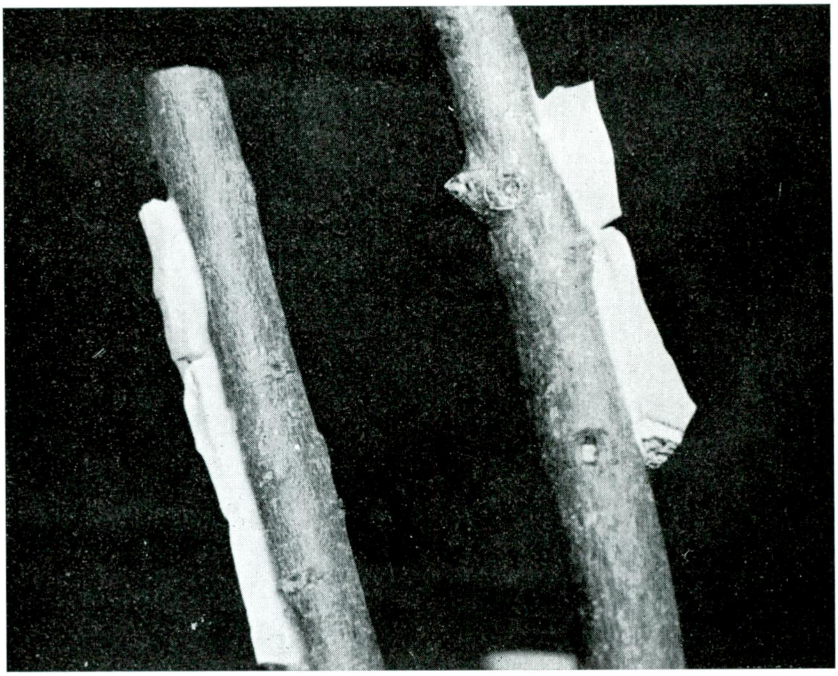


Fig. 3 — Sickle-blades mounted on sticks to form a simple self-made sickle.

Fig. 4 — Jack Harlan cutting wild wheat on the Diyarbakır-Urfa road: close-up of mounted sickle-blades.

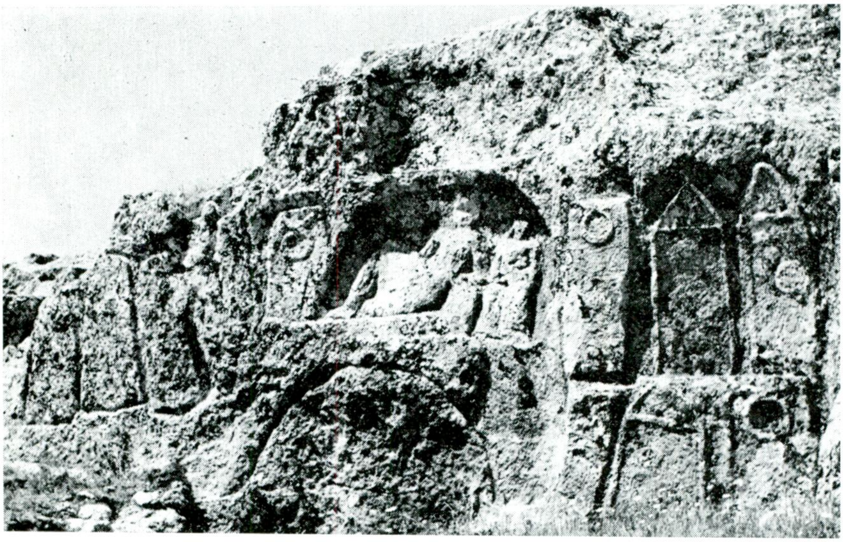


Fig. 5 — Rock-cut reliefs at Hilar.

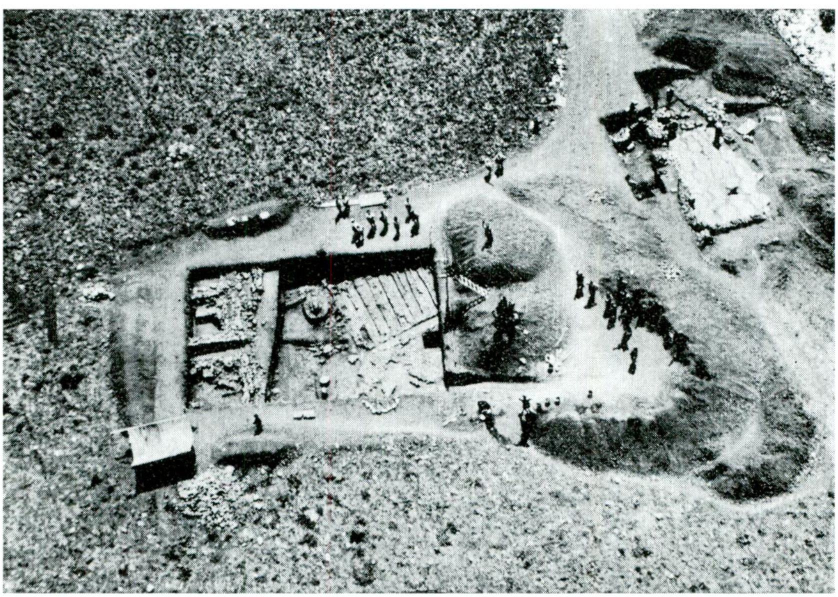


Fig. 6 — Çayönü: air view of excavated area in 1964.

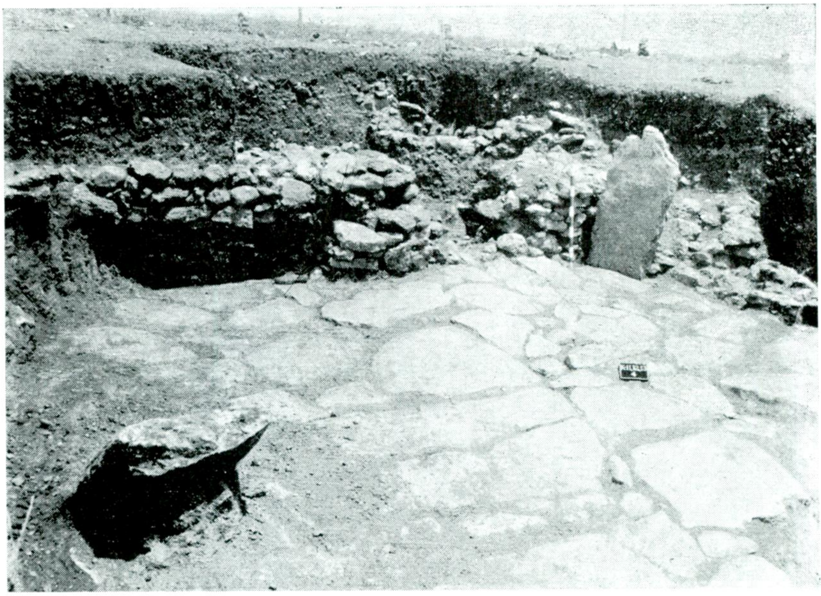


Fig. 7 — Çayönü : paved area with surrounding walls and standing stones.

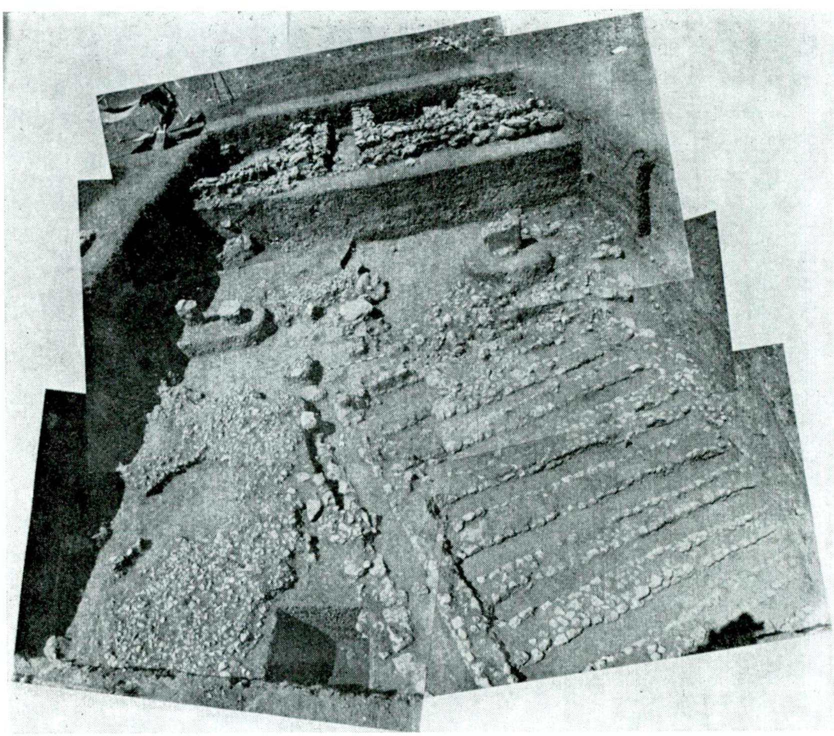
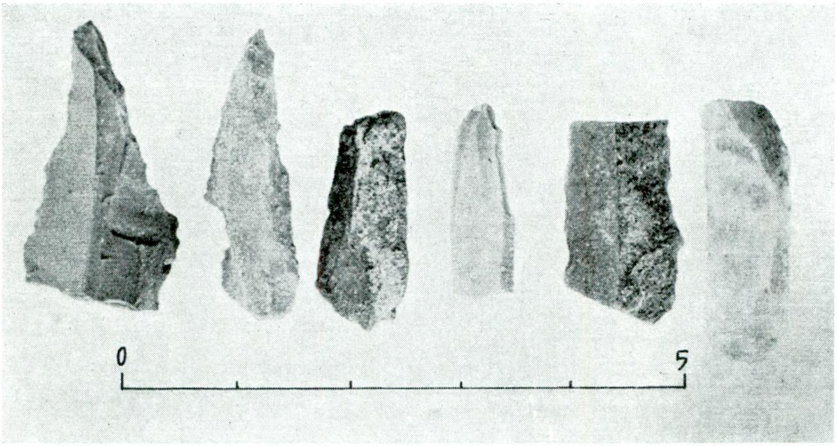
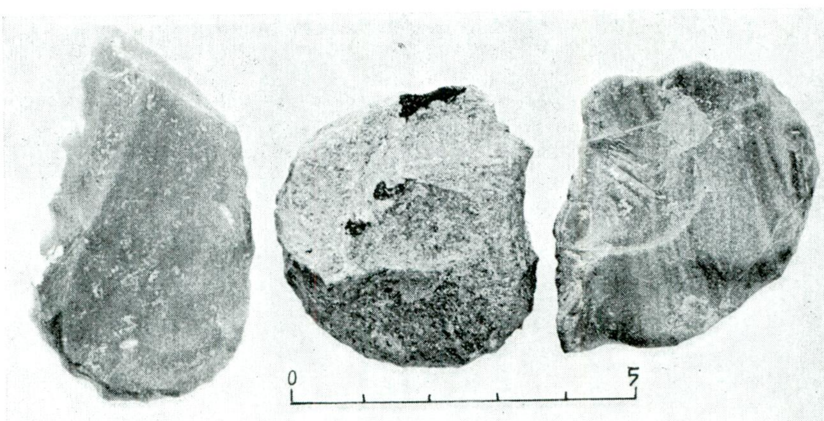


Fig. 8 — Çayönü: grill construction right foreground, pebble pavement left foreground, vestiges of two standing stones at center right and left, later layers in the background.



a.



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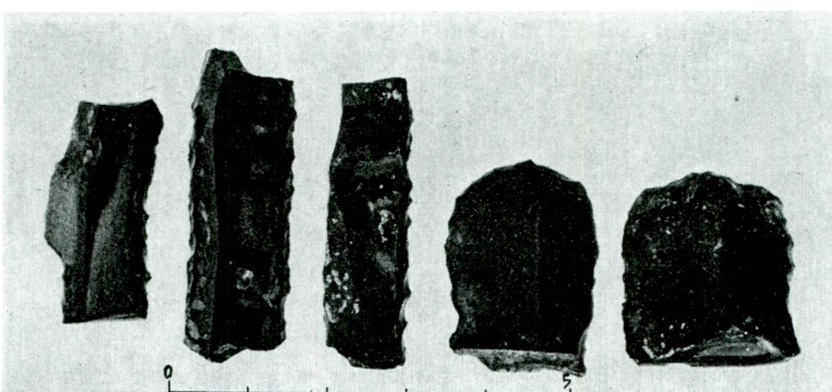

c.

Fig. 9 — Çayönü: flint (a-b) and obsidian (c) tools.

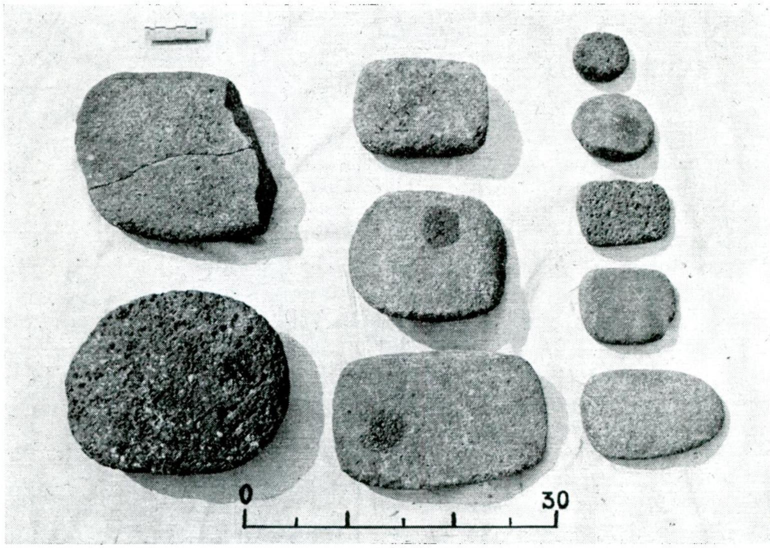

Fig. 10 — Çayönü: ground stone objects (basalt).

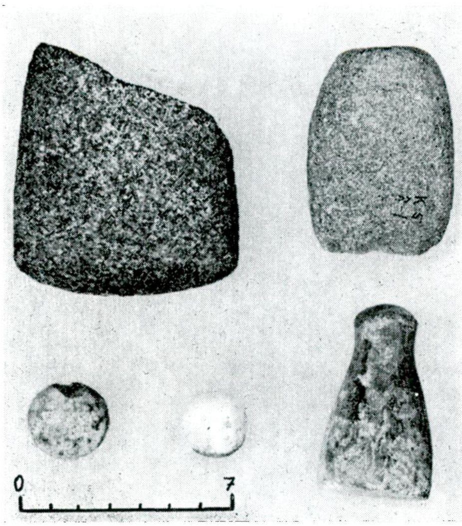

Fig. 11 — Çayönü: stone celts, roundels and pestle-shaped object.

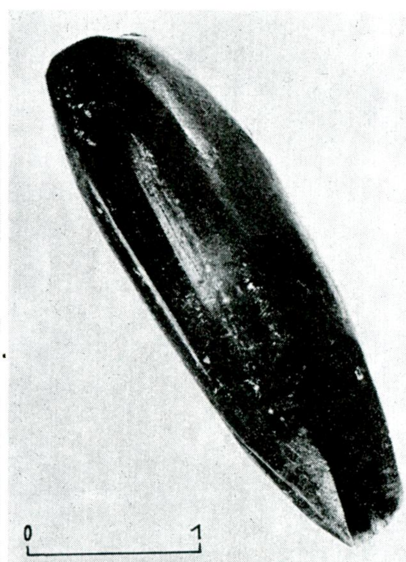

Fig. 12 — Çayönü: polished celt.

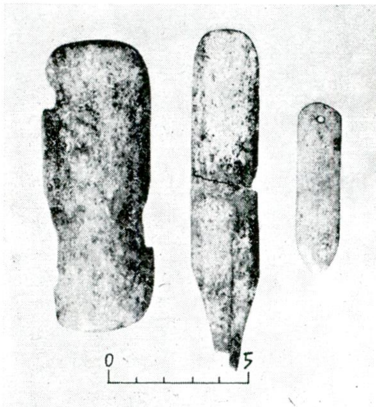

Fig. 13 — Çayönü: bone tools.

Fig. 14 — Çayönü: rim piece of incised stone vessel.

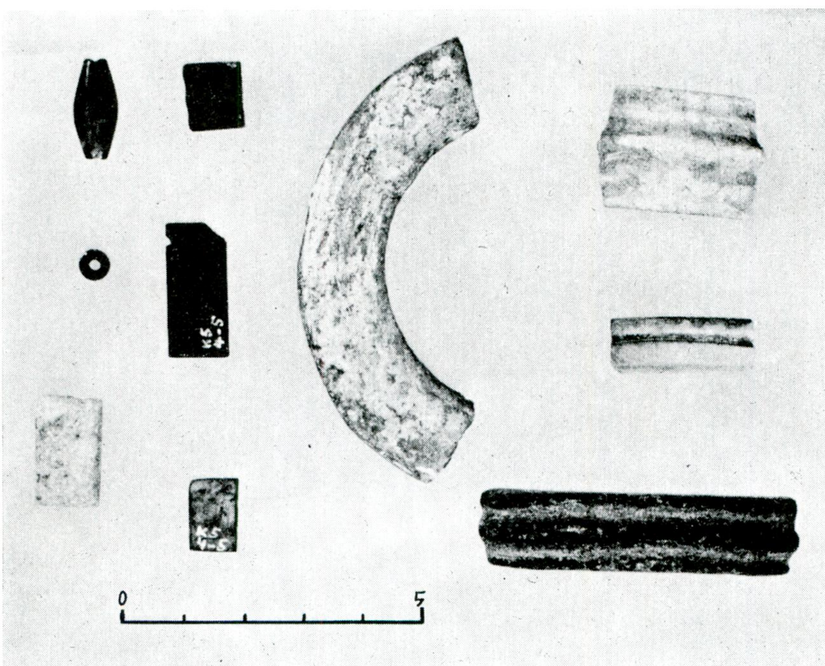

Fig. 15 Çayönü: fragments of bracelets and beads of marble and hard stones.

Fig. 16 — Çayönü: clay figurine, lightly fired (ca. 2,5 cm high).

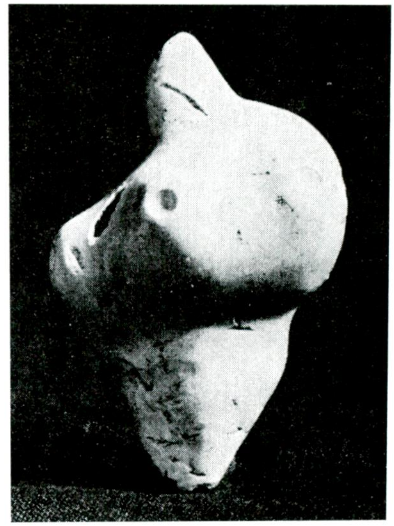

Fig. 17 — Çayönü: worked specimen of *Murex trunculus* (ca. 6 cm high).

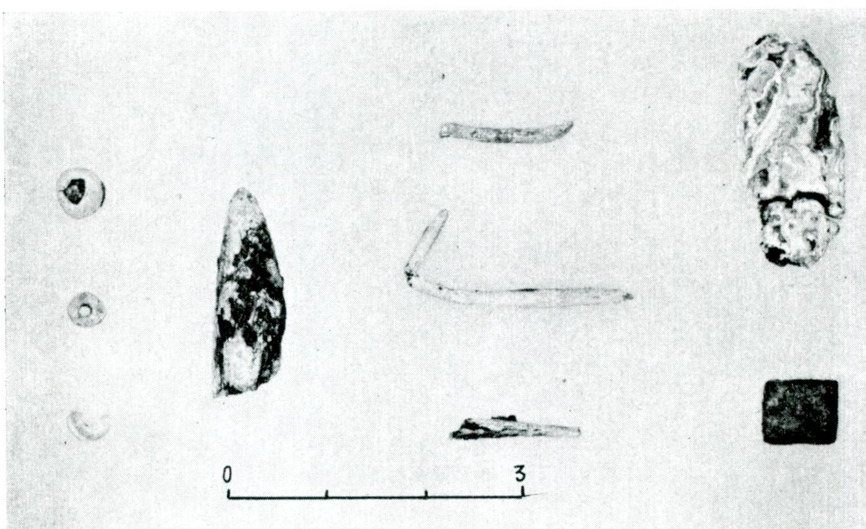

Fig. 18 — Çayönü: malachite and copper objects (fragment of copper reamer, left center; fragments of copper wires or pins, right center).

ation about the plan cover, the climate and the food plants associated with the different cultural layers of the sites under examination.

Another interesting and experimental procedure relevant to the beginnings of agriculture and the emergence of early villages may be mentioned here. Under natural conditions the reproduction of wheat and barley, like that of wild grasses generally, is guaranteed by the fact that the grain-laden spike becomes brittle at maturity and disintegrates into spikelets containing the seed, which then shatter readily at contact or movement and can be easily transported and spread by winds and animals. However, this brittlenes of the spike, which facilitates natural reproduction, impedes the collecting or reaping of these grasses by man. Moreover, the difficulty of removing the wild grain from its husks, or glumes, makes it very difficult to decorticate in order to make it edible.

The recessive tendency to develop toughness of the spike axis or rachis, which exists in some wild grasses, including wheat and barley, made it possible with time to reduce the difficulty of collecting and reaping. Human selection of tough-rachis grains for harvesting in return favored the tough-rachis genes in the seed grain and led to an increasing proportion of these in fields planted by man. Another mutation that occured in grains fostered by man was the genetic change from a tough or "hulled" kernel with adhering husk, or glume, to a naked, free-threshing type[9].

On the assumption that wild grains under the above circumstances could not be harvested by man in amounts sufficient to provide a satisfactory basic food-supply, the presence of edge-sheen on sickle blades and that of grinding stones had been considered evidence for the existence of purposeful planting, viz. agriculture; and the transition from a nomadic to a settled village way of life had been thought of as a result of the development of agriculture.

During the last decade, however, serious doubts have arisen regarding this issue. Since 1963, Jean Perrot[10] has reasoned that man

[9] H. Helbaek, "Domestication of Food Plants in the Old World", *Science* 130, 1959, p. 365 ff; K. V. Flannery, "The Ecology of Early Food Production in Mesopotamia", *Science* 147, 1965, p. 1252, fig. 3.

[10] Lectures given by Jean Perrot since 1963; also J. Perrot, "La préhistoire palestinienne", *Supplément du Dictionnaire de la Bible* VIII, 1968, col. 383, 389; J. R.

could very well have exploited rich stands of wild grains and could even have been satisfied with collecting them rather than going to the trouble of growing them himself. This is a hypothesis that could be tested by experimentation.

It was with a view to clarifying this issue that the plant geneticist of the Prehistoric Project, Professor Dr. Jack Harlan, was able to obtain concrete results by experimenting with dense stands of wild grain (fig. 2) around Karacadağ (province of Diyarbakır) and Viranşehir (province of Urfa). Through hand-stripping and harvesting in the old tradition by means of a self-made flint-bladed sickle (fig. 3) he was able to reap 2,5 kg of wild wheat in one hour (fig. 4). This corresponded to 1 kg of clean grain and to almost 23 % of crude protein. Reckoning that the members of a family group would be able to reap some 50 kg of wheat per day with such stone sickles, or 40 kg by hand-stripping, it could clearly be established that by beginning at the base of Karacadağ and working upwards with the ripening grain, they could without exertion and within a normal harvesting period of about three weeks accumulate over 1 ton of wheat, which would fully cover their annual needs and would, when supplemented by hunting, fishing and other plant foods, provide an adequate food-supply for the whole year. The grain, probably made edible by pounding in stone-mortars such as are still used in Anatolia, must have constituted a very attractive food-material due to the ease with which it could be obtained and stored, and the security and high food-value it provided. It would, therefore, probably not be unreasonable to suppose that small groups of hunters could have settled down in seasonal camps with the aim of harvesting wild grains and that, considering the difficulty of transporting their annual harvest and the degree of their dependence on it, they could have become sedentary in time [11]. It thus becomes apparent that agriculture need not have been a prerequisitive for sedentariness.

The study of animals is no les important for the solution of our problems than that of the plants. Although in later periods archaeological

Harlan and D. Zohary, "Distribution of Wild Wheats and Barley", *Science* 153, 1966, p. 1079.

[11] For detailed information cf. J. R. Harlan, "A Wild Wheat Harvest in Turkey", *Archaeology* 20, 1967, p. 197-201.

evidence pointing to the existence of animal domestication within certain sites, has been provided by the discovery of the actual gear involved in it, such as bridles and the like, or by contemporaneous representations, the discovery of this type of documents is rare and accidental.

It is therefore through the direct study of the animal bones themselves that zoologists involved in this field of study have in our day developed a new branch of science, which they call zooarchaeology or archaeozoology. By comparing wild and domestic forms it has become possible to determine criteria and stages of domestication; and, though the study of the animal bone from archaeological sites, much information can now be gained regarding the subsistence pattern of the communities that once lived in these early times and places.

A great many genetic or morphologic changes took place in animals during the process of domestication as compared to wild species living under natural conditions [12]. Thus the change, generally the reduction in size of the skeleton, the changes in the forms of the bones of the skull, of horns and of other bones, the increase of milk and the increase of the woolly underfur at the expense of the hairy fur [13] offer important clues in trying to solve the puzzle. However, these morphologic changes need not all be the results of domestication. Thus, it is imperative to obtain specimens of both the wild and the domestic forms from the areas that are being studied in order to arrive at the correct criteria and, through these, at correct results.

As regards the evidence from excavations, non-morphologic criteria such as the types and proportions of species; the frequency of the different bones of each species leading to an appraisal of the minimum number of animals within each of them; the ratio of age and sex groups; the areas of concentration of bone within the site, etc. are all equally important.

While there is no great difference in the proportion of male to female in wild herds, in domestic herds the young males seem to have

[12] K. V. Flannery, *op. cit.*, p. 1253-54; S. Bökönyi, "Archaeological Problems and Methods of Recognizing Animal Domestication" in *The Domestication and Exploitation of Plants and Animals* (P. J. Ucko and G. W. Dimbleby eds.), Chicago, 1969, p. 219 ff.

[13] K. V. Flannery, *op. cit.* p. 1253, fig. 4.

been butchered, while the females were protected for breeding and for milk so that in time the females made up the majority. Again, the differing numerical proportions of various age groups within domestic herds is different from that within wild ones.

The collecting of whole bones, broken bone fragments and even smaller scrap, preferably under the supervision of specialists, and the recording of their find-spots within the excavated area, their classification and analysis will cast much light on the community involved. The animal species that were utilized, the number and proportion of hunted versus domesticated animals, the composition of the herds, the amount of animal protein within the diet, the techniques of butchery, the specific parts of the butchered animals that were utilized, the clustering of activities within the site and numerous other aspects are all things which provide clues on the way of life, the modalities of nourishment, the spheres of activities and other such issues within the settlement of the communities in question.

Besides the extensive field level association with archaezoologists on our team, it was possible to obtain the collaboration of Professor Dr. Bahtiye Mursaloğlu of the Department of Zoology of Ankara University, Faculty of Sciences, in assembling specimens of wild and domestic animals and in the creation of a collection of comparative bone material in her department. Professor Mursaloğlu's keen interest made it possible for one of her assistants, Haluk Anat, to join us in the field and to begin gathering the species needed, so that they should be available for further study. For this collaboration and interest I want to extend our thanks to her here anew.

Another field of research that is perhaps as interesting and important as the genetic changes in plants and animals caused by human manipulation are the movements, due to human intervention, of raw materials specifically localized in nature, for example amber, marine shells, raw bitumen or obsidian. They provide clues on the early exchange of goods, caravan roads and the like.

Volcanic glass, viz. obsidian, was very popular for the manufacture of primitive tools and was one of the earlier raw materials to be used in bulk quantities. It constituted producer - not consumer - goods, was sought out and carried from far off regions and was subject to widespread trading. In the Near East this material is to be found in its natural state almost exclusively in Eastern Anatolia between Van and Erivan and in the regions of the Hasan and Melendiz Mountains southwest of Kayseri. It was transported all over the eastern Mediterranean lands from these two main sources.

It has been possible, by chemical trace-element analysis, to differentiate groups of obsidian coming from the various specific sources. Such knowledge of the source and the composition of its material allows one to assign natural points of origin for the obsidian tools found in the different archaeological sites and, thus, to trace the trade routes, transport and caravan lines along which this material was carried within or beyond Anatolia [14].

One of the important aims of our project was, therefore, to carry out a more extensive and a more systematic investigation of obsidian sources, to collect specimens from the various volcanic flows within each source and to study this problem in more detail through a variety of methods of analysis. The collaboration of the Mining Research and Exploration Institute (MTA) was sought and obtained in this effort also, and our thanks go to the Director General Dr. Saadettin Alpan, the Vice-Director General Ali Dramalı and the Scientific Counsellor of this Institute Professor Hâmit Nafiz Pamir for their keen interest and help.

In the archaeological field proper the initial surface survey yielded some 132 sites, including a series of camp - and settlement sites of the sort which was apt to shed light on the transition to productive economy in this area. In hopes of elucidating the problems under discussion preliminary soundings and excavations were undertaken on three different camp - or settlement sites [15], corresponding to three different phases :

[14] C. Renfrew, J. E. Dixon and J. R. Cann, "Obsidian and Early Cultural Contact in the Near East", *Proceedings of the Prehistoric Society* 32, 1966, 30 ff. fig. 5; Gary A. Wright, *Obsidian Analysis and Prehistoric Near Eastern Near Trade : 7500 to 3500 B. C.* (Museum of Anthropology, University of Michigan, Antropological Papers No. 37), Ann Arbor, 1969.

[15] For brief preliminary notices cf. R. J. Braidwood, H. Çambel, P. J. Watson, "Prehistoric Investigations in Southeastern Turkey", *Science* 164, 1969, p. 1275-1276; H. Çamber and R. J. Braidwood, "An Early Farming Village in Turkey", *Scientific American* 222, 1970, p. 50-56.

1. *Biris Mezarlığı* and *Söğüt Tarlası* by Gölbaşı, near Bozova (province of Urfa) as sites on the final food-collecting phase having flint and obsidian industries, with pottery only in the upper levels of Söğüt Tarlası;
2. *Girikihaciyan* on the Ergani-Diyarbakır highway near Ekinciler village (province of Diyarbakır) as a well developed early village site with surface indications of Halafian painted pottery;
3. *Çayönü Tepesi* near Hilar (now officially Sesverenpınar) village, near Ergani (province of Diyarbakır) as an early village site intermediate between these two foregoing and likely to shed light on our main problem.

The great antiquity of the sites in the region of Bozova was revealed through the work of one of our teams as well as by the earlier work of Prof. Dr. Kılıç Kökten and his finding of lower palaeolithic tools of Acheulean nad Levalloiso-Mousterian tradition[16]. Soundings at *Biris Mezarlığı* and *Söğüt Tarlası* yielded a predominantly filint blade industry with abundance of microliths probably from the final food - collecting phase at the end of the Palaeolithic. This may be tentatively assigned to about 10 000 B.C., although adequate samples for C - 14 analysis could not be recovered. The site of Biris was not occupied subsequently. At Söğüt Tarlası, however, another settlement followed this early horizon, and through an abundant yield of beveled-rim bowls, could be associated with the Mesopotamian Uruk phase and the horizons of Amuq phases F, G and part of H. It can, therefore, be placed between 3500 – 2800 B. C.[17]

Girikihaciyan is a low mound near Ekinciler village which yielded evidence of a well developed early village-farming settlement of the late 6th to early 5th millenium B. C.: rubble walls; flint and obsidian tools; ground stone objects; bone tools; monochrome and a smaller amount of "Halaf" type painted pottery. This last can, through its predominatly mat paint, be associated with the eastern branch of

[16] K. Kökten, "1946 Yılı Tarihöncesi Araştırmaları", *Belleten* 11, 1947, p. 162 and "Anadolu Prehistorik Yerleşme Yerleri ve 1944-48 Yıllarında Yapılan Tarihöncesi Araştırmaları", *IV. Türk Tarih Kongresi* (Ankara 10-14. 11. 1948), Ankara, 1952, p. 198, fig. 4.

[17] Revza Ozil, *Söğüt Tarlası Kazısı Çanak Çömlek Toptuluğu*, Istanbul University, Faculty of Letters, unpublished licence-thesis, 1969, p. 56 ff. 91-92.

the Halef province, i. e. Arpachia [18] and Banahilk [19]. Although it has been known for many years that painted pottery of Halaf type occurs over a vast area, stretching from the upper Tigris-Euphrates basin to the Mediterranean coast and up to Malatya and Tilkitepe near Van, nevertheless, the entire assemblage of finds with which this pottery is associated has not yet been sufficiently described. Work at Girikihaciyan may, therefore, be particularly relevant.

Çayönü Tepesi, which will, as an early village site associated with the beginnings of food-production, shed much light on our problem from the culture history viewpoint, is a low mound measuring approximately 250 × 150 m. located in the lower foothills of the Taurus range 7 km southwest of Ergani. It lies in a region of numerous mounds and archaeological vestiges of later periods. The striking limestone formations south of the stream that skirts the mound contain late antique rock-cut chamber-tomb, some with reliefs and semitic inscriptions (fig. 5) as well as other rock-cut chambers, halls, stairs, cisterns, etc., once described by Ellsworth Huntington as Hittite ruins [20]. The modern village of Hilar (now officially Sesverenpınar) is built among these same limestone formations.

Excavations at Çayönü Tepesi (fig. 6) [21] have yielded 6 or more occupation horizons. Only the latest two of these, occupying a limited part of the northern section of the mound, yielded pottery; the earlier, pre-pottery layers, occupied the rest. The later of the two pottery bearing layers yielded wheel-made pottery of approximately early to mid 3rd millenium B. C., a cist a grave containing a flexed burial and pots of the mid 3rd millenium. The earlier pottery layer had walls of rubble and mud-bricks associated with limited amounts of

[18] M. E. L. Mallovan and J. C. Rose, "Excavations a Tell Arpachiyah, 1933", *Iraq* II, 1935, p. 1-178.

[19] P. J. Watson in R. J. Braidwood, B. Howe *et al.*, *Prehistoric Investigations in Iraqi Kurdistan* (SAOC No. 31), Chicago, 1960, pp. 25, 33-35.

[20] Ellsworth Huntington, "The Hittite Ruins of Hilar, Asia Minor", *Records of the Past, II*, 1903, p. 131-136.

[21] Our thanks for the aerial photographs go to General Emin Alpkaya, Commander of the IIIrd Tactical Air Force, Diyarbakır, in 1964; Staff Colonel Ali Gür, Commander of the 8th Air Base; Major Hüseyin Ergöçmen, Commander of the 184th flight and Captain Murçak, who operated the aircraft; and First - Lieutenant Sami Bilgin, who flew the helicopter.

crude, crumbly hand-made pottery of approximately 4000 B. C. or earlier.

Due to their particular bearing on our problem we shall here deal mainly with the earlier, pre-pottery, levels which can, by a series of C - 14 determinations, for which we are indebted to Professor H. T. Waterbolk of Groningen University as well as to Michigan University, be assigned to approximately 7070±186 B. C. and earlier. These deposits have, besides an inventory of flint, obsidian, ground stone and bone characteristic for settlements of this phase, yielded a series of extraordinary finds.

Among these are a group of buildings of monumental size and character. One of them was a structure apparently cut into the southern slope of the mound and partly eroded by the stream. It displayed an area paved with large flagstones 1-1. 20 m in size. It was still surrounded by walls on three of its sides. Large standing stones stood in line across the wide axis of the paved area and in alignment with inner butresses reinforcing one of the walls; but it is not clear whether they served as roof supports or whether we are in the presence of an open enclosure (Fig. 6-7). Another set of impressive constructions at the base of our exposures were ones with parallel series of foundation walls of rubble, 0.50 m wide and only 2-3 courses high. These walls alternated with open intervals of the same width, and were framed into a rectangular whole by an outer wall of the same character, the whole constituting a kind of grill construction. One of these measured at least 5×7 m (fig. 6, 8). The function of these structures, of which a smaller edition made of *touf* seems to exist in Jarmo, is not yet understood. As things stand, they give the impression of being foundations that are intended to provide adequate aeration for some superstructure, keeping the ground humidity out. However they are to be interpreted, some of the structures in these levels are amazing for the size of their building materials and their proportions as well as for their advanced building technique and conception, unusual for this phase. They give the impression of having been built by, and of having served, a social group larger than a single small family unit. Whatever the case, an architecture of this caliber must have been based on a past of solid building experience and tradition. Compared to other examples from pre-pottery sites, with the exception of Jericho, the astounding quality of the Çayönü architecture truely stands out.

In these earlier levels of the site the inventory consisted for the greater part of chipped flint, lesser quantities of obsidian (fig. 9) and an abundance of microliths. Ground stone objects, mainly grinding and pounding stone, mortars, pestles and the like (fig. 10) were abundant. Besides these there were polished and unpolished celts (fig. 11-12); bone tools (fig. 13); fragments of ornamented and unornamented vessels (fig. 14), fragments of bracelets, pendants, beads (fig. 15), all generally of metamorphic rocks, marble and the like; clay objects, among them human (fig. 16) and animal figurines, and clay and other fragments with mat impressions. A specimen of *Murex trunculus* with smoothed off spines and decorative drill holes (fig. 17) is interesting in indicating intercourse with the Mediterranean coast over a distance exceeding 350 km[22].

Among plant and animal remains must be noted an early species of wheat, domestic sheep, pig, dog and possibly goat.

Finally, there must be mentioned a group of finds that are difficult to understand at first sight within settlements of this context. They consist of some 50 fragments with the bright green colour of an oxidized mineral. The deeper layers yielded pieces such as discs, beads, ring-like objects, the fragment of a reamer and, wires or pins pointed on one or both ends, some of which were bent (fig. 18).

It had been generally believed that the art or pottery developed next after the stone working tradition in settled villages, along with plant and animal husbandry, and that the possibilities of working metals, viz. copper, emerged at a much later stage, when a socio-economic level approaching to urbanism had been reached. It had therefore not seemed plausible that copper could have been worked in an early village context as yet unfamiliar with the fring of pottery. Thought was given to the possibility that these finds might have been made of copper oxides, such as malachite or azurite, which occur in nature in association with native copper and can be worked like stone. It seemed perfectly plausible that early man should have come across these mineral oxides in his quest for earth and mineral colours and that he worked them as he worked stone[23].

[22] This identification was made by Dr. A. Gautier of Ghent University, Belgium, for which I want to extend our thanks to him.

[23] Jean Perrot, *op. cit.* col. 431.

At least two of these mineral finds did, however, not fit this hypothesis, for a copper core was clearly visible in the reamer as well as in one of the wires or pins. Metallographic, microscopic, spectral-analytic and crystallographic analyses ultimately showed that while some of the finds were made of malachite, both the reamer and the wire or pin fragment were truely made of native copper beaten into shape, whether cold or hot hammered is as yet a moot point[24].

Even if the objects were made by cold hammering, which would not involve a pyrotechnic and, therefore, metallurgic process, still the fact of having treated native copper in different terms than stone and with a technique appropriate to this material itself at such an early date seemed highly amazing and of an order that somewhat upset the idea that metallurgy, even in its earliest rudiments, must of necessity have developed very much later than the craft of pottery.

It is true that the astoundingly developed, virtually monumental architecture of this early phase of Çayönü can be explained by the availability of large limestone block material nearby and that the working of copper, viz. metal at so early a stage can be explained by the Ergani copper lode that is only 20 km away. However, both of these findings, as well as the results so far obtained by the natural scientists in this region by going down to the roots of the problem, are already opening up large vistas not only with respect to southeastern Anatolia, but also with respect to human culture history at large. They not only provide detailed information for the problems under discussion on a regional level, but are also of an order to upset our tendency, still all too strong, of mentally trying to fit the process of developing human societies into a rigid unchanging and unilinear system. We should guard against necessarily considering particular elements as unchanging criteria of specific phases of cultural develop-

[24] For the analyses we are indebted to Professor Dr. S. Junghans, head of the *Arbeitsgemeinschaft für Metallurgie des Altertums bei dem Römisch-Germanischen Zentralmuseum in Mainz* operating in Stuttgart, Professor Dr. E. Gebhardt, Director of the Max-Planck-Institute for Metal Research in Stuttgart, Dr. K. Walenta of the Institute for Minerology of the Technical University, Stuttgart, Dr. W. von Engelhardt, Head of the Minerological-Petrographical Institute of the University of Tübingen; and for expert opinion to Professor Dr. Cyril Smith, Massachussetts Institute of Technology, Cambridge, Mass. To all I want to extend our warmest thanks.

ment and should break our habit of imprisoning ourselves in rigid systems of permanently conceived rules and criteria.

Social change and development is, in essence, a living process depending on a multitude of basic ecologic, techno-economic, social and purely human factors; and unless we go down to their roots it will be impossible to trace a solid and realistic outline of human culture history.

April, 1970.