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SALVATORE M. PUGLISI



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Comitato di Redazione: Editta Castaldi, Alberto Cazzella, Mario Liverani, Alessandra Manfredini, Fabrizio Mori, Alba Palmieri. *Direzione e Segreteria:* Istituto di Paletnologia, Facoltà di Lettere, Città Universitaria, Roma. *Collaborazione redazionale:* tutto il personale scientifico e tecnico dell'Istituto di Paletnologia. *Direttore responsabile:* Salvatore M. Puglisi.

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THE NATUFIAN OF PALESTINE: THE BEGINNINGS OF AGRICULTURE IN A PALAEOETHNOLOGICAL PERSPECTIVE

Margherita MUSSI - Roma

Introduction

Scientific interest has been focused, for many decades, on the so-called Middle Eastern «Fertile Crescent», as it is commonly assumed — although sometimes challenged — that agriculture, as well as herding of animals and, to a certain extent, a sedentary life, were first practised in this area of the world. The Natufian of Palestine, a rich culture which lasted approximately from 10,000 to around 8,000 B.C., has emerged during the last fifty years as one of the more attractive candidates for the origins of this new way of life. Natufian practice of agriculture, in particular, has been variously accepted or rejected, on archaeological grounds, by many different authors (see, for instance: Bar-Yosef 1970; Braidwood 1950, 1962, 1973; Braidwood and Howe 1960; Childe 1952; Legge 1977; Neuville 1934; Perrot 1968; Vita-Finzi and Higgs 1970). We think that a broader palaeoethnological perspective could be useful in our attempt to pinpoint this complex and decisive change in human history.

The archaeological background

The sequence of Late Würm-Early Holocene industries of Palestine has been established by Bar-Yosef (1970, 1975, 1976) as follows, with some regional variants: Kebaran, Geometric Kebaran A, Geometric Kebaran B and Natufian. In the Geometric Kebaran A, there is a substantial number of trapezes-rectangles, and other typological and technological differences from the Kebaran *sensu stricto*. Therefore, Hours (1976) recently proposed to give it an independent status, and to call it Falitian. Anyhow, the chronological sequence, and the broad cultural, as well as anthropological, continuity of the Levantine Epipaleolithic is generally accepted (Arensburg 1977; Arensburg and Bar-Yosef 1973; Bar-Yosef 1970: 186; Ferembach 1977; Hours *et al.* 1973: 459). From a palaeoethnological viewpoint, we can probably

assume a substantial continuity in the cultural traditions of human groups, who lived for some millennia in a quite restricted area, and who had a complex cultural background, though often the only surviving remains are flint tools.

Almost all the technological, typological and even ritual characteristics found in Natufian sites were already known during the preceding millennia: tools with sickle sheen and microburin technique are sporadically found; Mediterranean dentalia, ochre, basalt objects — sometimes from distant areas —, a small number of bone tools, as well as inhumation burials, stone-based dwellings, pebble pavements, may be present; large ungulates, and mainly gazelles, were hunted, as well as hares, birds, small carnivores etc.

In Natufian sites, these elements and characteristics are all found, but with a dramatic increase both in number and in quality: there are many tools with sickle sheen, standardized enough to be called sickle blades; microburin technique is much more usual; dentalia and other shells come not only from the Mediterranean, but from the Red Sea too; ochre is very common; there are many more stone vessels, as well as pounding and grinding tools, which may be richly decorated; bone tool typology is much more extensive, and includes barbed points and other points, sickle-hafts, pendants, animal carvings; burials are frequently found, and are usually elaborate; there are free-standing walls in some sites, as well as circular dwellings, which may be numerous and connected with each other; hearths are of various types; storage-pits are found; rituals are elaborate, as proved for instance by mutilation rites, as the extraction of one or more of the incisors in youth; gazelles, as well as small game, are hunted, and man is probably now helped by domesticated dogs (Clutton-Brock, in Saxon 1974; Davis and Valla 1978).

Sedentism

Natufian groups are not only richer, but probably larger and more sedentary than the preceding ones. Sites duration is difficult to assess, as C14 determinations are few, but at el-Wad, at least, they may indicate (Valla 1975: 21) that the site lasted one or two millennia, which accords with strata depth — one or more meters — in this and in other sites. A sedentary life during the whole year can neither be proved nor dismissed: Vita-Finzi and Higgs suggest seasonal migrations but, if their conclusions on the intrinsic poverty, both in animal

and in vegetable resources, of most territories exploited by Natufians were correct, the economic basis of this rich and successful culture would be quite puzzling. These Authors present their hypothesis of seasonal movements from site to site as an alternative of storage of periodically abundant resources. It should be added that elaborate non-mobile structures, as found in the coastal cave site of el-Wad (Garrod and Bate 1937), or complex and solidly build dwellings, as present in the inland open-air site of Mallaha (Perrot 1966, 1974), are highly indicative of some kind of stable occupation.

It is similarly very difficult to assess the number of inhabitants in each site: Perrot (1966) estimates that two or three hundred people lived at Mallaha, as he thinks that they were about fifty huts in every level, and that each of them was inhabited by a family. However, if we accept, with Flannery (1972), the hypothesis that some Natufian sites were compounds, so that most dwellings were inhabited by one person only, and others were common, specialized structures such as kitchens or granaries, we should reckon about fifty inhabitants: anyhow, it is a high concentration of people, probably related to an optimum ecological situation, and in other sites it may have been lower.

In central Palestine, we have been able to find evidence in the literature of about 20 Geometric Kebaran A sites, and of only 10 Natufian base camps, as defined by Bar-Yosef (1970): sites with dwellings, burials, massive grinding stones, decorated artefacts, and other characteristics which apparently indicate a stable occupation. Geometric Kebaran A and Natufian cover a roughly similar span of time, but part of the Geometric Kebaran A sites, located along the coast, may have been destroyed by marine level uplifting in Late Pleistocene-Early Holocene times. Furthermore, Natufian base camps are much larger, and more easy to locate. Natufian people were able to successfully and even brilliantly exploit available resources, and left rich and elaborate cultural remains. We should therefore consider not the hypothesis that population decreased, but that small bands clustered into larger and more stable groups.

Gazelle domestication

Legge (1972) considers that the gazelle was possibly domesticated in Natufian times or, at least, that hunting was very selective and well planned, and eventually led to closer man-animal relationships,

as there is a high ratio of young to mature animals in the sites he examined. Saxon (1974) favors a mobile herding economy, with management of gazelle herds, and preferential hunting of adult males. Recent works, however, seem indicate that, for many reasons — for instance, related to animal behaviour — large ungulates can never be « randomly » hunted, and that high ratios of young animals are not enough to prove definitely a special herd-man relationship (Collier and White 1976; Henry 1975; Jarman and Wilkinson 1972), while behavioral proclivities of gazelle make its domestication highly unlikely (Simmons and Ilany 1975-77). Ducos (1969: 269) maintains that age groups for gazelles, at Mallaha, are similar to those for wild populations. Planning in gazelle huntig is possible, but probably not essential, if we consider that past techniques were not as ecologically disruptive as present ones, and that human groups, in any case, were quite small. We were unable to find any reference to this kind of practice among present-day hunter-gatherers, who, it must be emphasized, generally live in marginal areas, with an arduous ecological balance: such peoples as the Hazda of East Africa (Woodburn 1968), the !Kung Bushmen of South Africa (Marshall 1961: 237), the Blackfoot of North America (Levi-Strauss 1962: Chap. 1) even hunt pregnant females, which is against any hunt planning habit.

Cereal domestication

It is well known (Jarman 1972) that it is almost impossible to pinpoint the very beginning of cereal domestication from changes in plant morphology; so much so, that Helbaek (1966) identifies « cultivated wild barley » in Beidha Preceramic levels. Let us see what evidence there is, if not of cultivation, at least of cereal consumption in Natufian sites.

As stated by Zohary (1969), part of Palestine falls within present-day distribution of wild wheat and barley. With reference to Natufian times, we can quote the presence of cereal pollen both at Mallaha (Perrot 1966) and, slightly later, in the Harifian site of Abu Salem (Marks and Scott 1976), while emmer wheat was actually found at Mallaha (Legge 1977: 56). Present-day wild cereal fields in Galilee produce a return of 50-80 kg./1000 m², when there is enough rain (Zohary *op. cit.*). If we assume that, in this area, the Late Würm and Early Pleistocene climate was slightly moister than the modern

climate, though characterized by a trend toward aridity (Bar-Yosef and Tchernov 1966; Horowitz 1975; Marks and Scott 1976; Vita-Finzi 1964), a return of 50 kg./1000 m² is probably reasonable, so that 4000 m² would have been enough to provide a substantial part of the calories required by one adult during one year. Obviously, gazelle meat and other meat were also eaten, as well as seeds, berries, roots, etc., and sometimes fish and molluscs. If a large site such as Mallaha was inhabited by about 50 people and if, as in modern non affluent human groups, 30 to 50% were children (see Lee 1972a: 334), about 150,000 m² — i.e. 15 hectares — would have been enough, in optimum conditions, to provide cereals for one year. Harlan (1967), in a well-known experiment, was able, with a flint sickle, and without any previous experience, to collect more than 1 kg. net of wild cereals in one hour. As known, cereals with a brittle rachis must be reaped before complete ripening, i.e., as said by Zohary (*op. cit.*), in a very few days. Reaping can be planned during a longer period if cereals are collected in an area with a sharp altitudinal gradient, so that ripening is delayed in the upper slopes.

This appraisal, admittedly very approximate, suggests that, assuming present-day pedological distribution as relevant, the amount of arable land within the exploitation territories of Natufian sites, as defined by Vita-Finzi and Higgs (1970) — i.e. within two hours' walking time — could be enough to provide food for most of the year, if partially covered by cereals, with a good planning of reaping time. We must assume strong annual variations in cereal yield, related to climatic fluctuations, but it should be added that larger site catchments are known from ethnographic reports (Lee 1968: 33; Lee 1972a: 346; Marshall Thomas 1959: 209) and that cereals were not necessarily a staple food in every site and at all times.

Natufian technology includes tools appropriate for every phase of cereal collecting and processing: sickle-hafts and sickle blades, storage-pits, grinding-stones, mortars. Stone pestles are also found, but as they are not longer than 30-40 cm. — and usually shorter and ochre-stained —, while mortars can be 90 cm. high, cereal pestles — or, at least, pestles used in connection with large mortars — were probably carved in wood, as large stone pestles would be too heavy. Sickle-hafts are few, and usually broken, while sickle blades — frequently blades with Helwan retouch, with or without truncation — are much more frequent, as they could be replaced in the haft, and as

flint more easily survives. At Mallaha, storage-pits have a capacity of 500-1000 litres (Le Chevalier and Perrot 1973). At Hayonim Terrace there is possibly one, smaller (Saxon and Leroi-Gourhan 1976), while at Wadi Fallah and, probably, Beidha, they are mentioned in the literature without further details. Elsewhere, they are not reported, but raised granaries — as the baskets used by the Siriono, who practice small scale agriculture (Holmberg 1969: 69) — would leave no positive archaeological record. Other tools and artefacts, such as baskets or skin containers to collect cereals, are necessary, too, but usually leave no archaeological trace. At Shanidar, however, in Iraq, in a level of the same age as Natufian sites, basketry fragments were found (Solecki 1963) while basketry impressions are reported from the mesolithic level of Tell Abu Hureyra in Syria (Moore 1975: 65). And we should remember that, much more so than meat, cereals require salt in cooking, and that contacts between coastal and inland sites are proved by the ubiquitous marine shells.

We can state, therefore, that Natufians probably had the tools and technology required successfully to collect and process cereals. Every single tool could have been used differently but, taken together, they point to cereal processing. Bar-Yosef *et al.* (1971-72) directly relate higher or lower dental attrition and, more particularly, higher tooth wear in sites such as Mallaha, Wadi Fallah, el-Wad, and lower wear at Kebarah and Hayonim, to a more or less abrasive diet and namely, to higher or lower vegetable consumption: chiefly, to the habit of eating cereals after grinding them with grindstones. Such groups as Iberomaurusians, however, who scarcely or never ate cereals, also present severely abraded teeth (Camps 1974). We suspect that gradient in tooth wear could be related mainly to food processing and cooking habits.

Food-sharing among hunter-gatherers

We think that the technological requirements needed successfully to collect and process cereals were probably not a problem for Natufian groups, but that the planning of gathering and cereal storage were possibly much more so. Apparently, the latter is related to profound transformations of social structures, as it can be seen among modern hunter-gatherers. When contact with higher technology and market economy has not been too disruptive, food-sharing practice is widespread. Food-sharing and, chiefly, meat-sharing — as hunting

is more difficult and the return less constant — is a common practice for people living in many completely different ecological environments: for example the Guayaki of Paraguay (Clastres 1972), the Paliyans of India (Gardner 1972), the Dorobo (Huntingford 1955), Hadza (Woodburn 1968), Mbuti Pygmies (Turnbull 1961), !Kung Bushmen of Africa (Marshall 1961). Guayaki hunters are even prohibited from eating the animals they have killed, and !Kung Bushmen follow, in meat sharing, rules which seem intended to make people forget who were the hunters. As vegetable food is usually much easier to collect, as a rule everybody gathers what he, or his close relatives, need; according to Marshall Thomas (1959), however, the womenfolk of the Gikwe Bushmen, who live in an extremely arid environment, with scarce food resources, share vegetables too. Marshall Thomas also describes some !Kung Bushmen distributing and exchanging large amounts of «tsi», a vegetable, so that absent people, too, get their share (1959: 207-209). As a rule, we can tentatively say that, the more difficult the struggle for life, the more compelling is food-sharing. By contrast, when food — or vegetable food only — is abundant, sharing in unnecessary. However, in this case, too, social rules can be indirectly compelling: Marshall (in Lee and DeVore 1968a, Discussions, part II) suggests that women collect only limited amounts of food day by day mainly for social reasons: large amounts of food induce jealousy, and/or a compulsion to share, i.e. working for other people. The Hazda, similarly, who know how to dry and store meat for months, prefer to eat quickly as much as possible, and to leave to vultures the parts or whole animals which cannot be immediately utilized: «To eat meat slowly, to preserve it and store it, would be largely wasted effort: other people would simply demand meat when their own was finished and it would be wrong to refuse them» (Woodburn 1968: 53).

A direct effect of food-sharing is therefore a day-by-day way of life. Ethnographic reports indicate that as long as there is food inside the camp, people are lazy and relaxed, without any initiative for the next few days, even when hunger or starvation could be foreseen in the next future. This social rule militates against storing but, in a way, results in the members of the group relying upon one another, and allows an optimum circulation of goods. On the other hand, social stress grows, when reciprocity is not practiced: only a minority of Hazda men (Woodburn, in Lee and DeVore, 1968a, Discussions,

part III), for instance, regularly hunt: as meat is shared among all people in the camp, a good hunter attracts other people, who live and depend on him, until he and his close relatives decide to move. But such extreme, parasitic habits, are probably possible only in permissive environments, and not when struggle for survival requires everybody to work.

Food-sharing, as an optimum adaptation to varying resources, is also evident, by contrast, where hunter-gatherers societies are heavily disrupted: the Dorobo themselves, who became, in 10 years, mainly agriculturalists, first share meat with close relatives, and then give what may be left over to other people (Huntingford 1955). The Siriono of South America who, as said by Holmberg (1969: 11) probably « have gradually been pushed northward into the sparsely inhabited forests they now occupy, and (...) in the course of their migrations (...) have lost much of their original culture », jealously keep food — and most of all meat — for themselves and some close relatives; so much so, that any lucky hunter may hide a killed animal in the forest, return to the campsite acting as an hungry man with empty hands, and at night, when other people sleep, secretly cook and eat his prey. The Ik of East Africa (Turnbull 1974), expelled from their homeland, are a well-known case of scarce resources being wasted to avoid sharing.

Food-sharing, sometimes as a duty, therefore is — or was, until some years ago — widely practiced among hunter-gatherers, and may be considered as an optimum way to reach a balanced circulation of food irregularly present in space and time. It is, apparently, a very useful, if not necessary, social adaptation, and we think we can apply it, as a working hypothesis, to Late Paleolithic hunter-gatherers. In the ethnographic record such behaviour is generally confined to small, mobile groups, fluid in number and composition (Lee and DeVore 1968b), so as to exploit natural resources more effectively: a model of the band with composite family structure is found, as shown by Woodburn (1968), among groups as different as the Hazda, the !Kung Bushmen, the Mbuti, the Ik, the Dogrib, the Netsilik Eskimo, the Gidjngali of northern Australia. Fluid bands, furthermore, easily solve social stress, as the group splits up when a conflict arise which cannot be solved by simple reprobation from the community (Lee 1972a, 1972b, 1972c; Lee and DeVore 1968a, Discussions, part III): hunter-gatherers headmen are *primi inter pares*, and their authority is

not enforced by strength. It is worth noting that, during the whole Paleolithic, and contrarily to later times, traces of violence — at least, as can be seen in skeletal remains — are extremely scarce.

The most significant exception to this model of flexible, sharing groups, is found among the North-West American Coast hunter-gatherers — or, more properly, fishers. Suttles (1968: 56-58) describes them as « people with permanent houses in villages of more than a thousand; social stratification, including a hereditary caste of slaves and ranked nobility; specialization in several kinds of hunting and fishing, crafts and curing; social units larger than villages; elaborate ceremonies; and one of the world's great art styles. (...) In general, (...) while the habitat was undeniably rich, abundance did not exist the year round, but only here and there and now and then, and (...) such temporary abundances — though they may well be a necessary condition for population density and cultural development of the sort seen on the Northwest coast — are not sufficient to create them. Equally necessary conditions were the presence of good though limited food-getting techniques, food-storing techniques, a social system providing the organization for subsistence activities and permitting exchanges, and a value system that provided the motivation for getting food, storing food, and participating fully in the social system ». While among the simpler groups we noted earlier, there is no return in goods or food accumulation, « a man with temporary abundance of any food had three choices: 1) he could share it with his fellow villagers, if they could consume it (which they could not if they too had the same abundance); 2) he could preserve it, if it was preservable and he had the labor force and time before the next harvest of fish, berries, etc. ... was due; or 3) he could take it to his in-laws in another village (where this particular food might be scarce) and receive in return a gift of wealth, which he might give later to in-laws bringing food to him » (*op. cit.*: 66-67). Whichever the chosen solution, rights on collected food were full and discretionary, so that storing had a direct return.

With a very few exceptions — such as the Bagundji of the Darling Basin, in Australia, who survived until last century (Allen 1974) — hunter-gatherers living in a temperate habitat, with abundant wild cereals, disappeared in prehistoric times. We think however that their most important — and common — characteristic may have been the following: they lived in a habitat with abundant resources, avail-

able during a short span of time only, *which could be stored*. We know very little of Late Würm ecology in the Near East: cereals were not the only available food, and possibly not the most important one everywhere; if, however, they were intensively collected, we think that food-getting organization, and social structure, could not be as fluid and egalitarian, and sharing as immediate, as amongst most modern hunter-gatherers, who have elaborate social and economic structures precisely when, as in the North-west coast of America, property rights are well defined, and food is personally owned and stored.

Natufian social organization: the archaeological evidence

As has been mentioned, Natufian technology was developed enough to enable the collection, processing and storage of cereals. It is much more difficult to find archaeological evidence of the social changes we have assumed. Flannery's compound hypothesis (see above) suggests however that social structures could have been more clearly defined than in modern composite bands: a compound means, instead of a fluid group, an extended family, with a headman or a headwoman, and everybody's rights and duties are better defined. That means, probably, that it is possible to plan food-collecting, storing and sharing. More closely-knit family structures, on the other and, do not easily allow fission to solve internal stress, and a higher authority is required. A present day example of difficulty in establishing «law» among composite band hunter-gatherers is given by Lee 1972a: 361) who thinks that the !Kung Bushmen readily accepted the legal system of the neighbouring pastoral Tswana, and that «the Tswana court proved very successful because the Bushmen have been relieved to have an outside agent take the heavy responsibility of resolving conflicts out of their hands». (See also Lee 1972 c).

Archaeological evidence of closer family ties and of more formal territorial rights could be found in probable remains of compounds at Mallaha and Rosh Zin, and possibly Beidha and Hayonim Terrace, as well as in inhumation burials, which are almost invariably characteristic of Natufian camp-sites in central Palestine: these could be seen as the evidence of formal claims over territories occupied by ancestors. Burials with multiple inhumations, re-used over a long period, — as at Mallaha, Hayonim, el-Wad, Shukbah, Kebarah — similarly point to family continuity, and the large round hearths, fre-

quently found outside dwellings, may indicate community activity and ties.

At Hayonim, at least, blood relationships are proved: Smith (1973) assesses that, since in almost 50% of adults third molars never erupted, this genetic characteristic indicates close family ties. Unfortunately, Smith does not indicate which exactly are the individuals concerned. If we study carefully the burial lists published by Bar-Yosef and Goren (1973), we find that the burials quoted by Smith are probably those grouped in the inner cave, and attributed to the earlier inhumation phases. We can tentatively suggest that these could indicate the «core family», the ancestors, who first lived at Hayonim.

In a comprehensive study of Natufian paleontological remains, Bar-Yosef, Arensburg and Smith (1971-72: 138; 144; 150) emphasize the racial homogeneity of this population, but maintain that the high variability found in metric values should be related to small and markedly endogamic groups (*op. cit.*: 130). As far as el-Wad is concerned, however, Bar-Yosef *et al.* underline a higher internal homogeneity, and they relate it to a different rate of genetic isolation (*op. cit.*: 125). So far, only a few tens of the hundreds of Natufian paleontological remains have been studied and published, and this could possibly explain these conclusions, to a certain extent contradictory. In any case, we should probably think of marriage customs as changing in space and time, and being related to historical events and conditions we still cannot even tentatively reconstruct.

We are reluctant to admit, in fact, that strict endogamy could have been a general and absolute practice in Natufian communities: first, even if we assume that, as at Mallaha, about 50 people were present during the whole year in each site — quite a high estimate —, it means that adults possibly numbered about 25-30: probably not enough for a strictly and permanently endogamic community (see also Wobst 1974); secondly, although each site has distinctive features, there is such a network of archaeologically proved contacts (fig. 1 and Mussi 1976a, 1976b)¹, that we must assume close ties from site to site, at least in the core Natufian area, i.e. from Mt. Carmel to Lake

¹ See also almost identical decorated basalt pestles at el-Wad (Garrod and Bate 1937: Pl. XV: fig. 4 n. 1) and Mallaha (Perrot 1966: fig. 17 n. 4); identical bone borers at Mallaha (Perrot 1966: fig. 22 n. 17) and Hayonim Terrace (Henry and Leroi-Gourhan 1976: fig. 8, m); similar engraved motifs on bone at Hayonim Terrace, and on ostrich eggshell at Rosh Zin (Henry and Leroi-Gourhan 1976: 399).

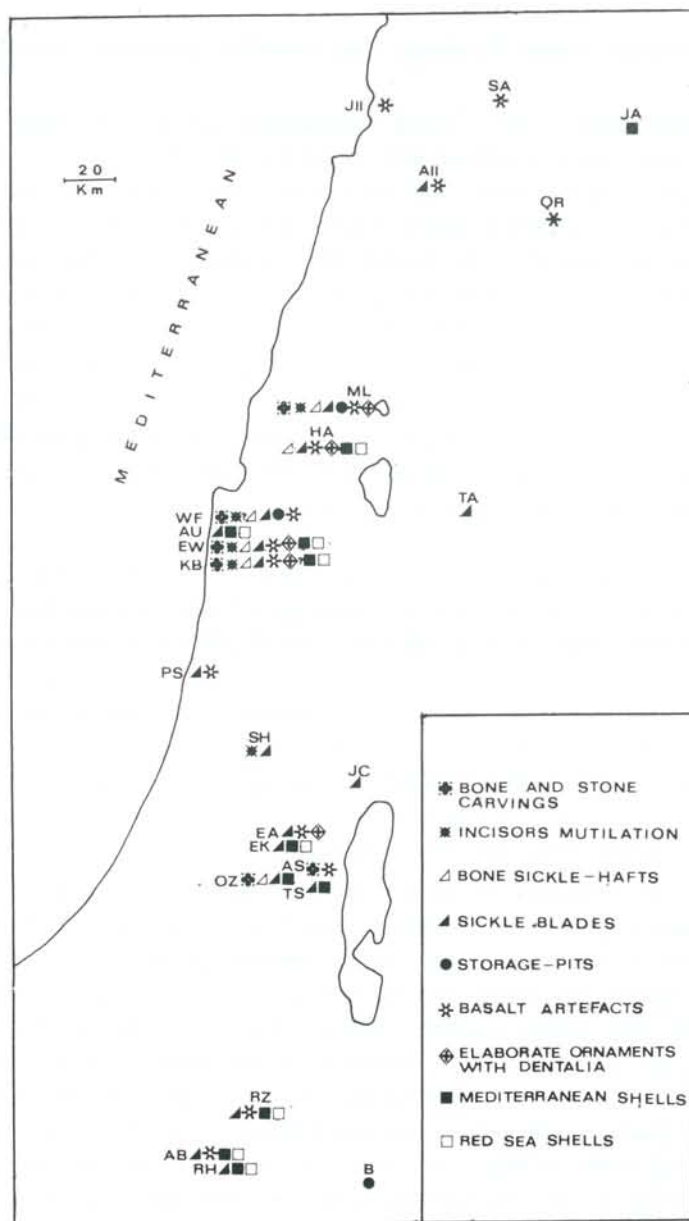


Fig. 1 - Simplified distribution map of some selected cultural elements. Natufian sites: JII: Jiita II; Sa: Saaidé; JA: Jabroud; AII: Amiç II; QR: Qornet Rarrha; ML: Mallaha; HA: Haynonim; TA: Taibé; WF: Wadi Fallah; AU: Abu Usba; EW: el Wad; KB: Kebarah; PS: Poleg Sharon. SH: Suqbah; JC: Jericho; EA: Erq el-Ahmar; EK: el Khiyam; AS: Ain Shakri; OZ: Oumm ez-Zoueitina; TS: Tor Abu-Sif; RZ: Rosh Zin; RH: Rosh Horsha; B: Beidha; Hayonim Terrace is not included. Harifian site: AB: Abu Salem.

Huleh, and to the area north-west of the Dead Sea. Mediterranean and Red Sea shells, as well as basalt tools, found tens or hundreds of kilometers away from their place of origin, similarly prove at least long journeys and/or exchanges of goods. Taken as a whole, it is not the archaeological situation we would expect from close-knit, endogamic communities. However, any absolute statement is impossible, as accurate ethnographic investigations indicate that the distribution of material culture traits is not as closely related to marriage moves as it has commonly been assumed by archaeologists (Hodder 1977).

Conclusions

We can summarize our conclusions as follows: before Natufian times, small nomadic groups inhabited Palestine. They were gazelle hunters, and their journeys were planned so that, from generation to generation, they occupied again and again the same sites, and sometimes even the same dwellings. They gathered vegetables, as all human groups in a temperate environment, and cereals may have been collected, but only as a marginal addition to diet.

Around 10,000 B.C., in the central area of Palestine, archaeological sites become apparently less numerous. We suggest that the population clustered, and that some caves and open air sites were then occupied for many centuries. Among them, there was a network of exchanges, both of goods and of items, and of ideas and of cultural models, which apparently lasted as long as the sites themselves. Later, a similar trend toward stability and a richer culture is found in more marginal areas, such as the Negev (Mussi 1976a, 1976b)².

The trend toward sedentism and population concentration parallels a new richness in those cultural elements which are found by archaeological investigation. We think that this follows economic changes: not in gazelle hunting — although some groups, by then, had domestic dogs — but in gathering. Cereals, which were rarely consumed and, perhaps, rarely found before, became extremely important. We do not know if this happened everywhere at the same time or if, as it seems more probable, this shift was gradual and the process different from place to place. An archaeological perspective shortens gradual processes into instant events but, at least, emphasizes

² Maybe connected with the search for Red Sea *Dentalia*, which were known in the Sinai earlier than in Palestine (Bar-Yosef and Phillips 1977)?

how fundamental they were. The induced social stress was certainly dramatic. In different ways, and in different times, Natufian group structure became more formal and defined than in the small, fluid nomadic bands which could have existed before, and which persisted for a longer time in the surrounding areas. As a whole, we think that the dramatic increase in the technology and wealth of Natufian sites can only be related, as found in some modern hunter-gatherer communities, to an economy and social organization which allowed formal and, to a certain extent, personal claims, over goods and natural resources.

Every Natufian site is different and independent from the others, and the core area is quite distinct from the surrounding areas. The strong ties from site to site, however, in typology as well as in technology, economic models and rituals, enables us to speak of the Natufian as a well defined culture, different from the contemporary, as well as from the earlier and later ones. We can summarize its development with a star-like model: the centre of the star is our core area, which is homogeneous, and where most cultural elements can be found, sporadically, in the preceding cultures, so that we can probably assume that the socio-economic changes we postulate started in this area. The shorter rays mean the peripheral areas, as the Negev, where changes possibly came about later, and were related to influences from the core area, but with local adaptations to existing cultural traditions. The longer rays mean contacts with remote areas, such as the Red Sea Coast and Northern Africa, and the exchange of single elements, such as dentalia and, perhaps, salt, or the utilization of ostrich egg-shell, the ritual of extracting incisors, etc., which are found in quite different palaeoethnological situations.

Cereals, when intensively collected, mean a careful planning of the short reaping time, as well as storing and, later, fair sharing. We do not know — and perhaps, we shall never know — if wheat and barley were only collected, or planted too: the technological knowledge was adequate to both solutions, and planning and sedentism found in some Natufian groups at least makes both alternatives possible. Every historic change is gradual, and we now that there is no definite boundary between specialized gathering and different degrees in plant domestication. One or more Natufian groups may, sporadically or not, have planted part or all the cereals they reaped. We are not interested in the «first» agriculturalist: it is a rhetorical

abstraction, with a technological meaning only. We prefer to underline an historical event, which indicates changes towards an economy which not only allows, but also *requires*, efficient storage. We think that some Natufian communities, at least, assumed the characteristics related to a productive economy.

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Istituto di Paletnologia dell'Università di Roma

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SUMMARY

Studying the first steps toward plant and animal domestication, interest has been mainly focused on technological as well as ecological conditions which eventually led to such a dramatic shift in human way of life. The author first pinpoint probable similarities, as well as differences, between past and present hunter-gatherer societies, and then suggests a palaeoethnological model of the hunter-gatherer communities which eventually became agricultural. An attempt is made to apply this model to the Natufian of Palestine, a well known archaeological culture, dated around 10,000-8,000 B.C., with a transitory economic status.

RIASSUNTO

Nelle ricerche sugli inizi dell'agricoltura, l'attenzione degli studiosi si è generalmente indirizzata alla ricerca dei presupposti tecnologici ed ecologici che portarono a questo importante mutamento nello sviluppo della umanità. L'A., invece, prova a mettere dapprima in rilievo le probabili somiglianze, e le diversità, tra i cacciatori-raccoglitori attuali e quelli preistorici, per poi suggerire un modello paleontologico delle comunità di cacciatori-raccoglitori che si trasformarono in gruppi di agricoltori. Con questo modello teorico vengono confrontate le testimonianze che si hanno, in campo archeologico, del Natufiano della Palestina, una cultura preistorica relativamente ben conosciuta, datata tra il 10.000 e l'8.000 a.C., e con uno sviluppo economico di transizione tra la caccia-raccolta e l'agricoltura.