

The Epipalaeolithic-ceramic groups of Libyan Sahara: notes for an economic model of the cultural development in the West-Central Sahara

A model classifying societies according to the system of subsistence has lately gained hold. The theoretical debates of the last few years (Binford, 1972; Flannery, 1969; Higgs and Jarman, 1969; Harris, 1969) identify in the beginnings of food production one of the basic themes of the cultural change. As it is well known, however, the distinction between Mesolithic and Neolithic period, between gathering and producing economy, is neither clear-cut nor evident.

Taking advantage of the numerous acquisitions of multidisciplinary approaches, studies on food-producing development have presently rectified the traditional conception which viewed "culture" as a whole which is transmitted onwards, so that "similarity" is a synonym of "uniformity of development" and "difference" — a sign of interruption in the development — is explained by recourse to stimuli, influences and migrations. Conversely, the systematic explanation (Von Bertalanffy, 1950; Buckley, 1967; Bennett, 1976) states that disequilibrium among subsystems, or among the systemic components and the environment, may bring about cultural changes as a readjustment phenomenon founded on an adaptive procedure.

The conditions of the Palaeolithic-Mesolithic society are the premises which, under specific spurs, caused the system to move towards a change: but this occurred within the system and not outside it.

We believe that the Western Sahara territory, and specifically the area of the Hoggar-Tassili-Acacus massifs, may offer quite an interesting contribution to the change in the passage to food-producing activities. We would like to propose, within this framework, the hypothesis of an economic model such as might have been achieved in the area that is the center of our research effort, which might eventually be extended to others connected to it from a cultural point of view.

Reporting on the results obtained by the Mission of the University of Rome in the Ti-n-Torha (Acacus) area (Barich, 1974), we purpose to define the economic profile relying on palaeoecologic evidence rather than on technologic proofs, and in par-

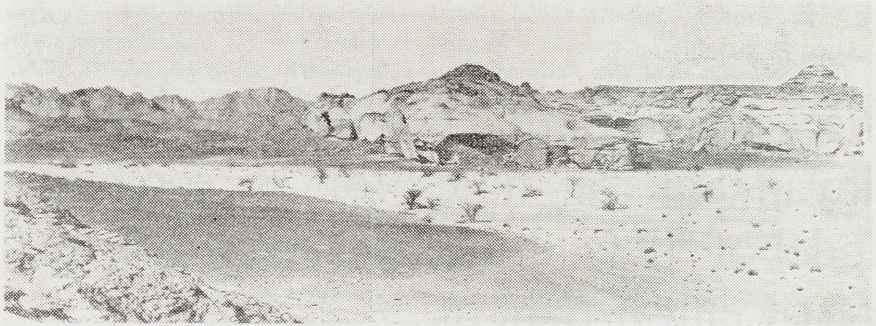


FIG. 1. Wadi Ti-n-Torha, Tadrart Acacus (Libya)

ticular on the presence of pottery. As a matter of fact, our definition of "Epipalaeolithic-ceramic" tends to signify that the mere presence of pottery is not sufficient to prove a change in a structure, which is still Palaeolithic.

In 1978 our Mission started excavating a new deposit sited a little distance away from Torha East, which was named "Ti-n-Torha Two Caves" (Fig. 1).

The results, which are presently being studied, provide confirmation of the definition of "Epipalaeolithic groups with a preliminary experience in ceramics" which had already been applied to the Torha East facies and allow for the following propositions:

1. The area of the Sahara being studied presents itself as a generalized ecosystem of hunters and hunters-gatherers-fishermen aiming at exploiting, on an extensive scale, the resources supplied by the biome. The groups inhabiting it are viewed as small aggregations of people with an inherent knowledge of the land who, however, due to their possibility of exploitation of an extensive range of resources, were not compelled to too frequent shiftings and whose settlements were of a semi-residential character.

2. The reduced nomadism, and the inherent knowledge of a restricted area, give evidence of incipient domestication of botanical or animal species in the small mountain valleys or in the more open plains that mark the edge of the geographic region which are dominated by savannah-type vegetation. It would appear easy to combine, in this area, the gathering of animal proteins, supplied by hunting and fishing with the gathering of vegetal proteins supplied by wild plants.

These propositions lead to the formulation of a working hypothesis that groups being studied had succeeded in realizing a pre-domestication economy. At a system level, this economy would be comparable with the intermediate moment in the taxonomy of the recently reconstructed Syrian-Palestinian economic development.

This hypothesis may be tested with recourse to the plentiful analytical data of the *in situ* works (1971 - 1978 excavations). From necessity, we shall report them in a schematical form relative to the various documentation sectors.

1. Settlements

Encampments are sited along the "uidian" sides, in a position suitable for living purposes and at quite a higher level, with respect to the valley-bottom, for obvious protection against floods.

The anthropic deposit thickness and the structural adaptations bear witness to a settlement continuity. The unmistakable use of stone, both as a defence wall and as a partition of space that was already known at Torha East, was found once again at Torha — Two Caves.

Furthermore, due attention should be given to the possibility of division of living spaces, where heaps of materials or greater concentrations of worked wastes suggest a workshop area. Generally, the large amount of residual products prove that litho-technical activities were practiced on the spot, using local raw material — quartz and sandstones — which were obviously plentiful.

The possible alternation, however, in the use of the sites, some designated more for working activities than for living and vice versa cannot be ignored.

The residential form conceived by the groups under considerations is symptomatic of a tradition on the site, as proved by the absolute dating series covering a time period extending from the 8th to the 6th millennium B. C.

2. The environment and the fauna

The Ti-n-Torha, affluent of the larger Auis, is cut into the lower part of the "Tadrart formation" (Devonian series). The clayey strata, that are typical of the basic part of the series, crop up in a few places and represent the impermeable level of presently temporary springs. The wadi has a very young morphology, due to a series of collapses that followed successively — throughout the whole Holocene. The presence of impermeable clayey strata, covered by a large volume of sandstones which acted as tanks, leads to the supposition that at a time when the climate was less dry than at present, the area was transversed by watercourses and small ponds.

Faunal remains gave evidence of a less arid climate. All the levels of Torha East have shown the presence of two molluscs (*Caracollina amanda* and *Bulimus bronde-lianus*) which denote a hot climate with a high degree of humidity. From the Torha East faunal determination list an articulated picture can be drawn of the species with the presence of moufflons (*Ammotragus*), gazelles, hedgehogs, porcupines, jackals, foxes and mongooses. In addition to the afore-mentioned animals were rodents, *Ophidia* and birds that confirm a savanna framework with good rainfall levels, although in a decreasing phase.

The Torha—Two Caves faunas are presently being studied. According to preliminary examination the presence of fish is clearly evident. The prevailingly bones

refer to small animals; the almost complete absence of parts such as jaws and teeth has also been observed. This may signify that the animals were not hunted directly on the site but that they were brought there after a preliminary selection. This fact confirms the aspect of the settlements as "home bases".

3. Technology

The stone industry — on strongly compact sandstones, quartzrocks and quartz — specialized in tools and implements for hunters and hunter-fishers. In the lower levels there is a very strong incidence of the laminar types, related to small cores with lengthened strucks and a high percentage of microlithic flakes, among which there are, in particular, the pointed-backed bladelets with abrupt retouch. These artifacts are particularly significant for the proper setting of the complex, corresponding in full to the Epipalaeolithic model; of no lesser significance, for the same purpose, are the geometrics (Fig. 2). In the upper part of the deposit (in relation to the lithic structures) a greater relevance is acquired by the macroimplements (side- and end-scrapers, denticulates) obtained through direct percussion from stones that, at times, determine their shape. At the same time arrow-heads are quite frequent (Fig. 3).

The Table that summarizes the list of Torha East types and the relative presences within the complex framework shows the incidence of the "blade group", which is 90,7% (general index). Within this group, the class of the pointed backed bladelets, with a 12% percentage index, is among the most significant for the complex setting (Fig. 4).

It is well known that any debate on the possibility of comparison of industries must be founded on specific statistical proofs which might facilitate evaluation of the utilization covariances. Obviously, our documentation is presently inadequate to formulate a multivariate analysis and, on this account, our indications will require further control. It goes without saying that the reference to the Ibero-Maurusian environment appears to be the most enticing one, even in the light of the most recent findings in the Atlantic Sahara belonging to the same cultural environment (Collina-Girard, 1977; Heddouche, 1977). Taking into account the extreme antiquity of our industry, its location, the inferable economic system, it appears to us that the Upper Palaeolithic hunters' environment, of the western Sahara, is the milieu one more reasonably turns to.

4. Broadened considerations

In view of the specific environmental requirements and the location aspect, one may hypothesize that the groups had attained a pre-domestication condition (Jarman, 1969) assimilable, at a system level, with the Near-Eastern examples. We are refer-



FIG. 2. Wadi Ti-n-Torha, Tadrart Acacus (Libya). East Shelter: stone tools (after Barich, 1974)

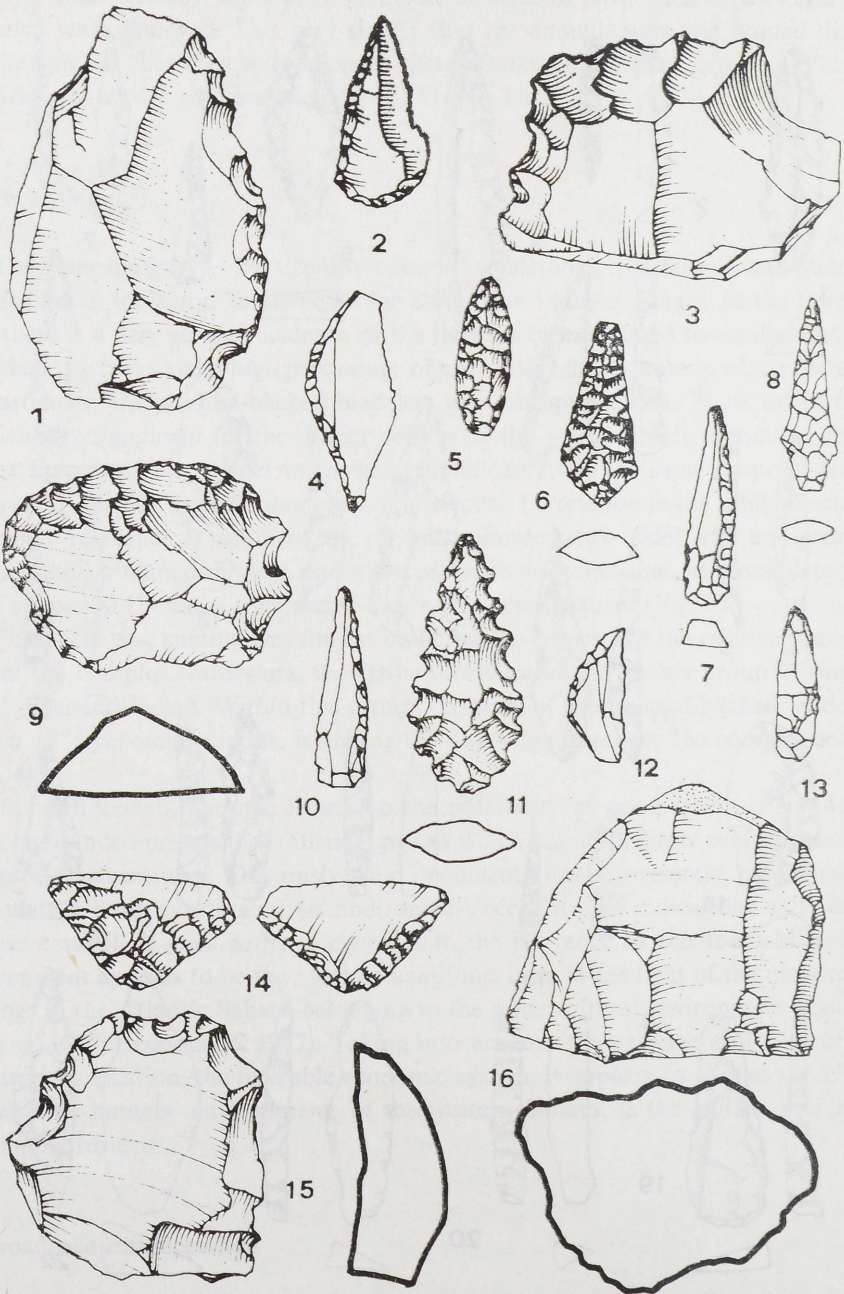


FIG. 3. Wadi Ti-n-Torha, Tadrart Acacus (Libya). East Shelter: stone tools (after Barich, 1974)

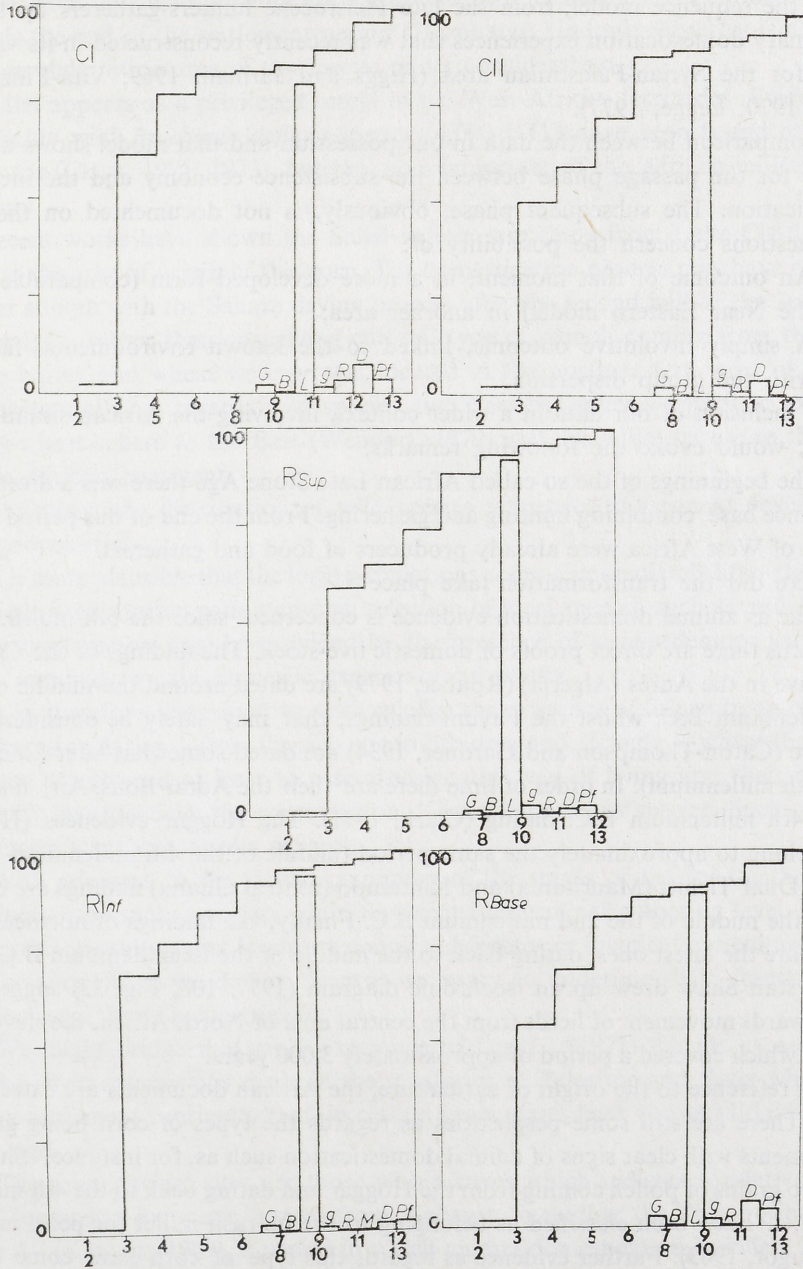


FIG. 4. Wadi Ti-n-Torha, Tadrart Acacus (Libya). East Shelter. Diagram of the lithic industry (after Barich, 1974)

CI: Level 1; CII: Level 2; R_{Sup}: Level 3; R_{Inf}: Level 4; R_{Base}: Basis of level 4

G: Scrapers; B: Burins; L: Blades; g: Geometrics; R: side-Scrapers; M: micro-Burins; D: Denticulates; Pf: Arrow-heads

ring to the sequence model, from the late Pleistocene hunters-gatherers up to the preliminary domestication experiences that was recently reconstructed in its various stages for the Syrian-Palestinian area (Higgs and Jarman, 1969; Vita-Finzi and Higgs, 1970; Legge, 1977).

A comparison between the data in our possession and that model shows a coincidence for the passage phase between the subsistence economy and the incipient domestication. The subsequent phase, obviously, is not documented on the site. Our questions concern the possibility of:

1. An outcome of that moment, in a more developed form (comparable with the Near Eastern model) in another area;
2. A simply involutive outcome, linked to the known environmental factors, with the group dispersion.

The inclusion of our data in a wider context, involving the African situation in general, would evoke the following remarks.

At the beginnings of the so-called African Late Stone Age there was a diversified subsistence base, combining hunting and gathering. From the end of this period a few peoples of West Africa were already producers of food and gatherers.

Where did the transformation take place?

As far as animal domestication evidence is concerned, since the 5th mill.B.C. in the Acacus there are direct proofs of domestic live-stock. The findings of the Cappeletti Cave in the Aurès (Algeria) (Roubet, 1979) are dated around the middle of the 5th millennium B.C. whilst the Fayum findings, that **may** safely be considered as domestic (Caton-Thompson and Gardner, 1934) are dated somewhat later (2nd half of the 5th millennium). In order of time there are then the Adrar Bous, Air, findings with a 4th millennium B.C. dating (Clark, 1971). The Hoggar evidences (Hugot, 1963) belong to approximately the same period (middle of the 4th millennium B.C.) and the Dhar Tichitt (Mauritania) and Kintampo (central Ghana) findings are dated around the middle of the 2nd millennium B.C. Finally, the findings of northeastern Nigeria are the latest ones, dating back to the middle of the 1st millennium B.C.

Thurstan Shaw drew up an isochronic diagram (1977: 108, Fig. 33) suggesting a southwards movement of herds from the central area of North Africa, the development of which covered a period of approximately 3,000 years.

With reference to the origin of agriculture, the African documents are extremely scanty. There are still some perplexities as regards the types of corn being grown in settlements with clear signs of animal domestication such as, for instance, Shaheinab. Two grains of pollen coming from the Hoggar and dating back to the 4th millennium B.C. have been classified as belonging to the bulrush millet (or pearl millet) type (Hugot, 1963). Further evidence as regards this type of corn have come from Dhar Tichitt (Mauretania) and thus for a significantly later period (middle of the 2nd millennium B.C.) In this location it has been possible to observe the progressive increase of bulrush millet growing during the entire settlement period (from the middle of the 2nd to the middle of the 1st millennium B.C.), following the progressive

passage from still wild-growing corn types to fully domestic forms which appear towards the end of the settlement period (7th phase). Undoubtedly, this is a domestication elaboration area of the species under consideration.

Millet appears as a privileged cereal in the West African territories. Evidence of a probably wild *Brachiana deflexa* species (4,000 B.C.) have been found at Adrar Bous, Air (Clark, 1971; 1973), but the most important of the African millets is the sorghum.

Recent works have shown the Sahel region, stretching from Lake Chad to the Nile, as the area of origin of this corn. The domestication process may have received greater stimuli with the Sahara drying process after the second half of the 3rd millennium B.C., rather than conceiving cultural type of stimuli coming from the areas where barley and wheat were grown, located in the north-eastern area of Africa.

Substantially, as regards wild species, two clear-cut spheres appear to exist: the barley-wheat sphere to the East (Wendorf, 1979) and the millet sphere to the West of the African continent.

Obviously, the distribution of wild species influenced subsequent development and propensities.

It is more plausible that the local populations coming immediately after the Palaeolithic hunters started with a gradual selection of local species, such as millet. A key to the explanation may be provided by the presence of semi-sedentary ways of living, required to gain domestic experience on plants.

It is, therefore, important to acknowledge the existence of fishers in an extensive area crossing Africa — from the Atlantic to Ethiopia and Uganda — where the groups became accustomed at least to a semi-residential way of living and their diet was partially integrated by the consumption of wild herbaceous species. Such situation is exactly what our results suggest.

With reference to the virtual taxonomy of the stages of the food-gathering to production passage, our data could represent the terminal gathering level. Instead, insofar as the subsequent levels are concerned (proto- or incipient agriculture; actual village agriculture) we do not deem it necessary to underline their absence in the sequence we have reconstructed.

We might bridge this gap by recourse to Legge's (1977) scheme as a synthesis of the latest acquisitions made in the territories of Palestine and Syria where there was a settlement continuity that, in certain cases, dates back to the Middle Palaeolithic age.

The most ancient sites are those within caves which indicate a relatively stable and long-term economic system from Kebaran, including the "pre-pottery Neolithic A" (Kenyon, 1969), a period in which animal domestication is widely accepted, even in relation to species such as the gazelle. Notwithstanding the perplexities that have been voiced to this purpose, it is likely that there was some type of control and deliberate selection relative to gazelles and just as likely to plants which were grown for the benefit of human life (Legge, 1977: 59).

Parallel to the last part of the cave occupation (Mesolithic and pre-pottery Early Neolithic) the first dwelling on the sites developed which, later on, became residential "tells". Even though the economic model — in terms of species being utilized — shows little changes, there is a clear difference in the scale of settlements and in the economic potential of the areas where they are located. Furthermore, it is essential to note the different emphasis placed on the exploitation of local resources that at that time aimed prevalingly at botanical species (Legge, 1977: 62).

The Jericho, Hureira and Mureybet sites are, as a matter of fact, located in areas where preference had to be given to crop growing owing to the high potential of the soil.

It was estimated that the PPNA levels of Jericho must have supported a population of 2-3 thousand heads (Kenyon, 1969) and even the similar levels at Abu Hureyra had had an "extremely numerous" population (Moore, 1974) although their resources were essentially similar to those available, at the same time, on the Natufian levels. As Kenyon has suggested, it is quite difficult to imagine that this might have been attained without an agricultural type organization. Therefore, if we accept the hypothesis of agriculture of morphologically wild species as PPNA base, no different from those available to the Natufians, we should ascribe the same possibility to the latter. One should clearly consider as completely different the type of organization being realized, with special emphasis on crop-growing and the consequent reduction of animal domestication.

Going back to the African territory, for a long time the occurrence of domestication was explained by the diffusion mechanism. Since, as we have already mentioned above, domestic animals spread to the interior of Sub-Saharan Africa, it would have been enticing to think that even cereal agriculture in Africa followed the same process. However, lacking any evidence on shifts of farmers, the explanation may be only domestication on local species.

As we have already stated, one has to abandon the assumption that agriculture marked the end of a nomadic-type of life. We have shown the middle part of Sahara as the area where fishing practices had accustomed the groups to a semi-sedentary way of living. By determining a reduction of the water zones, the land drying-out process may have led to overexploitation of the available fish resources. In turn, this may have led to emphasise of gathering as a diet-integrating element, although the drying up would result in the doing away of those very species. These circumstances might have acted as a stimuli for the artificial growth of grasses all around the areas where fish was still available (Shaw, 1977).

Likewise, in view of the fact, that as we have already mentioned, wild cattle was present in Africa and in the Nile Valley (to the North of the Tropic of Cancer) during the Early Holocene, one should not rule out the possibility of a North African local cattle domestication. However, the relation between the preliminary experiences on local species and the mature phase, that could really be a Nile Valley phenomenon, needs further investigation.

By way of a conclusion the picture by Desmond Clark (1976) seems appropriate. Starting from 4,000 B. C. the dryingup process led to an increase of diversified activities: livestock concentration — smaller animals at first (sheep-goat) and later cattle, that allowed the groups to preserve their dwellings on the site until the deterioration of the climate compelled them to move away (in various direction: to the desert massifs, to the North African coasts, to the Sahel and to the South-Western savannah, in the Nile Valley).

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