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AN OUTLINE OF THE CHRONOLOGY OF THE MIDDLE PALAEOLITHIC IN THE LEVANT

by

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1. INTRODUCTION: THE ARCHAEOLOGICAL SEQUENCE

This paper attempts to summarise the chronostratigraphy and palaeoenvironmental evidence for the Levant and Northern Africa in an effort to provide a clearer understanding of the dating of the Middle Paleolithic sequence. For the sake of brevity and in order to avoid unfounded correlations with the Alpine glacial sequence, we have chosen to encapsulate it within the framework of the Oxygen Isotope stratigraphy. This framework constitutes a well recognized time-scale that is applicable to the entire Old World. The correlation between the various Isotope stages and Levantine events is done on the basis of U-series dates and palaeoclimatic interpretations of terrestrial and lacustrine deposits. However, in cases where neither are clear, alternate correlations are given.

The archaeological sequence under discussion begins with the latest manifestations of the Acheulian. These are known from the terraces of Nahr el Kebir, the Orontes and from marine terraces along the Lebanese coast (SANLAVILLE, 1981; BESANÇON, 1981). On the Israeli coastal plain, the Acheulian is absent from the two westernmost *kurkar* (sandstone) ridges which are commonly attributed to the Upper Pleistocene (GILEAD, 1970). Each of the geomorphic sequences provides a similar picture, namely that the Acheulian is often followed by Mousterian industries. In the northern and central Levant, however, the Acheulo-Yabrudian (recently renamed by A.J. Jelinek as the Mugharan Tradition) separates the Late Acheulian and the Mousterian (JELINEK, 1981). Such is the case in the El-Kowm basin (northeast Syria), Jerf 'Ajla cave (near Palmyra), Yabrud Rockshelter I (Anti-Lebanon Mountains) and Tabun cave (Mt. Carmel). In Bezez Cave (Lebanese coast) and Zuttiyeh cave (near Lake Kinneret) the Acheulo-Yabrudian is overlain by the Mousterian, but no Late Acheulian is found underneath. In the Azraq basin (southeast of Amman), all three industries are present but not in the same locality. Despite systematic surveys, no Acheulo-Yabrudian artifacts were found in the Negev, Sinai or southern Jordan. Thus, the geographic distribution of this entity has clear boundaries.

The Acheulo-Yabrudian, as understood today, contains three facies. The "Acheulian facies" in which bifaces amount to 15 %, together with scrapers of various forms with

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relatively high frequencies of Quina and demi-Quina retouch. Despite their lower frequencies, both transverse and *déjeté* scrapers were considered as typical of this industry. The "Yabrudian facies" is basically the same but with rare or no bifaces. The "Amudian facies" exhibits a proliferation of blades, backed blades, some end-scrapers and burins with a few bifaces. The entire Acheulo -Yabrudian industry contains few or no Levallois products (COPELAND and HOURS, 1983; JELINEK, 1981).

The "Acheulo-Yabrudian" or the "Mugharan Tradition" hardly exhibits a transition to the Mousterian of Levallois facies except for Unit X in Tabun (JELINEK, 1982).

In this context it should be stressed that several of the Late Acheulian industries do present clear evidence for the use of Levallois technique. Such is the case for the Samoukian (COPELAND and HOURS, 1981) or the site of Berekhat Ram on the Golan Heights (GOREN, 1985). Similar observations were made in Egypt, especially in the Kharga Oasis (CATON-THOMPSON, 1952). Thus, we face a problem of technological continuity. While in Egypt, Cyrenaica and the southern Levant the Mousterian seems to have succeeded the Acheulian Complex, in the central and northern Levant, the sequence is interrupted by the Acheulo-Yabrudian. In our view, the geographic distribution of this entity indicates that its origins were in Anatolia or the Zagros mountain ranges.

The Levantine Mousterian is traditionally subdivided on the basis of stratified sites – mainly Tabun Cave – into three phases, originally named by COPELAND (1975) as "Tabun D", "Tabun C" and "Tabun B". Recently JELINEK (1982) grouped them into Mousterian "phase 1" and "phases 2-3". The basic technological and morphological characteristics of each phase are as follows:

1. The "Tabun D" industry is commonly comprised of blades and points removed from Levallois unipolar cores. Elongate points, racloirs and some Upper Palaeolithic types are the most frequent forms. If the Hummalian industry from El-Kowm, which is placed between the Late Acheulian and the Mousterian is included in this horizon, then a non-Levallois facies of an early blade/point industry is contemporary with Tabun D (COPELAND, 1985).

2. "Tabun C" blanks were often struck from Levallois cores with radial preparation, resulting in broad Levallois flakes. However, triangular points are frequent (unipolar cores) although in reduced proportions when compared to the earlier phase.

3. "Tabun B" seems to have mixed features with unipolar and bipolar cores along with radially prepared ones. Points are often short and broad, whereas flakes are thin, narrow and often laminar.

It is still debatable whether the Levantine Mousterian sequence is developmental, linear or both (e.g., COPELAND, 1975; JELINEK, 1981; BAR-YOSEF and VANDERMEERSCH, 1981). However, consideration of such issues is beyond the scope of this paper.

2. THE CHRONOSTRATIGRAPHIC SEQUENCE

Given the controversy over the dating of the Late Acheulian, the Acheulo-Yabrudian and the Mousterian, it seems most appropriate to commence with Isotope Stage 6.

A. Stage 6 (190-127 KA)

The chronological evidence for dating the earliest part of this sequence is quite fragmentary. In the northern Levant (Fig. 1), Late Acheulean sites are generally associated with either fluvial deposits as in NW Syria (BESANÇON, 1981) or lacustrine/paludal deposits such as those in the El-Kowm depression. The latter is particularly interesting since a succession of Acheuleo-Yabrudian, Hummalian and Mousterian complexes is found associated with travertines which yielded ages of ~150-130 KA for the Acheulo-Yabrudian (HENNING and HOURS, 1982). However, these dates should be viewed with some caution since the travertine materials that were dated are possibly mixtures of carbonates from various sources and ages (H.P. SCHWARCZ, personal communication, Dec., 1986).

In Zuttiyeh Cave (SE Galilee), U-series dates on travertines and dripstones show that the Acheuleo-Yabrudian predates 96 KA (range ~148-96 KA) whereas Mousterian material occurs after this time (SCHWARCZ *et al.*, 1980). These dates corroborate those obtained from Naame where a Mousterian industry overlies a shoreline dated to 90 KA and 93 KA (STEARNS and THURBER, 1967).

The Egyptian, Nubian and Cyrenaican Mousterian occurrences are found either within the Mediterranean vegetational zone, in the Nile Valley or in the deserts near springs or annual ponds. The damper conditions are attributed to pluvial periods, possibly indicating that the earliest Mousterian industries can be related to Stage 6 while some other Mousterian, Aterian and Khormusan industries can be tied to wetter phases of the Last Pluvial, namely Stages 5d, 5b and early 3 (WENDORF and SCHILD, 1980; WENDORF *et al.,* 1985). However, it is probable that the exploitation of the Nile Valley during the entire period under discussion continued uninterruptedly, although direct evidence for such a full sequence is lacking.

In Ethiopia, a Mousterian industry with bifacial points was K/Ar dated to 181-149 KA. It has an appearance similar to the "Stillbay" or Middle Stone Age industries of East Africa (CLARK, 1982).

B. Stage 5e (127 - ~115-118 KA)

In Lebanon, this interval is associated with generally high sea-levels, either the Enfeen I (SANLAVILLE, 1981) or only the Enfeen II (GVIRTZMAN *et al.*, 1983/4) which is associated with *Strombus bubonius*. Further south along the Israeli coast, this period according to some authorities is marked by the accumulation of dune sand represented by sandstones (*kurkar*) along the coastal plain or sandy infillings at the base of Tabun (Layers G, F and E; GOLDBERG, 1973). The correlation of these units in Tabun with positions of former sea level is still under discussion since they have also been assigned to the following regression (Stage 5d or 5b – FARRAND, 1979; JELINEK, 1982) or even placed within the regression associated with Stage 6 (BAR-YOSEF and GOREN, 1981). Fragmentary analyses of pollen reveal low percentages of arboreal pollen, indicating arid conditions of the "last interpluvial" (HOROWITZ, 1979).

C. Stages 5d to 5a (~118/115 to 73 KA)

The remainder of Stage 5 is characterized by fluctuations of wetter and drier conditions. Along the Mediterranean coast sea levels returned to heights reached earlier (the Enfeen II and Naamean of SANLAVILLE, 1981). Inland, and particularly in the Negev, there is an increased abundance of Early Levantine Mousterian sites and concomitantly a marked phase of coarse alluviation, in some places (Nahal Zin) associated with the formation of thick travertine deposits dated to betweenn 85 and 75 KA (SCHWARCZ *et al.*, 1980; MARKS, 1981; GOLDBERG, 1984, 1986); pollen recovered from many of these sites demonstrates markedly wetter conditions.

Many large lakes formed and expanded during this time, including Lake Lisan (predecessor of the Dead Sea) in the Jordan Valley, and in the depressions of Azraq, El-Jafr and Sirhan in Transjordan (NEEV and EMERY, 1967; GARRARD *et al.*, 1985; ROBERTS, 1982). The playa near Palmyra in Syria (SAKAGUCHI, 1978) possibly dates from this interval but the chronological control is not the best.

In southern Egypt several Mousterian and Aterian occurrences in the Bir Tarfawi-Bir Sahara area are associated with lacustrine environments, clearly pointing to wetter conditions (WENDORF and SCHILD, 1980; WENDORF *et al.*, 1985).

D. Stage 4 (73-61 KA)

As a result of sea level lowering during this interval the Mediterranean coastal plain expanded, particularly from Mt. Carmel southward into Sinai where the continental shelf is more pronounced and less steep than it is further to the north. Associated with this retreat is dunal activity and the development of *kurkar* ridges along the coast. In Tabun, sedimentological evidence (GOLDBERG, 1973; FARRAND, 1979) suggests the beginning of a drier phase in Layer D, interrupted by an erosional phase and culminating in Layer C time. The latest events in Layer C and in Layer B probably fall within the early part of Stage 3.

Alluvial deposits which accumulated during the preceding wetter phase experienced major downcutting and dissection. The resulting terraces are particularly well preserved in the Sinai and Negev, and the paucity of sites lends further support to suggestion of arid conditions at this time (GOLDBERG, 1984, 1986; GOLDBERG and BAR-YOSEF, 1982). A similar situation seems to have existed in the northern Levant (BESANÇON, 1981). Noteworthy is a shift in depositional style in Lake Lisan where previously deposited sands and gravels at the base of the sequence are successively overlain by more marly, chemical sediments (BEGIN *et al.*, 1974).

Along the Nile Valley a hyperarid period is associated with the Khormusan which is a kind of Late Mousterian industry (WENDORF and SCHILD, 1980).

E. Stage 3, early part (61 to 45/40 KA)

The general aridification that began in Stage 4 continues and reaches a climax in this early part of Stage 3. Erosion continues over much of the area and open-air prehistoric sites (particularly *in situ* ones) are relatively rare.

Renewed large-scale alluviation begins to occur ~45 KA in many of the Negev wadis, accompanied by the accumulation on a regional scale of aeolian silts which tend to be colluvially and alluvially reworked. These silts are accompanied by a marked increase in the number of sites in the region assigned to the final phases of the Mousterian (such as Farah II) and the early Upper Palaeolithic (MARKS, 1983; GILEAD and GRIGSON, 1984; GOLDBERG, 1986).

In the caves, a damper phase is registered where Mousterian layers were eroded prior to the first occurrence of Upper Palaeolithic industries (e.g., El Wad, Kebara, Rakefet and Hayonim). These wetter conditions continue well into the later part of Stage 3 and are associated with deposition at Upper Palaeolithic sites that are not considered in this paper.

3. DISCUSSION

This brief summary presents just the essential elements of the work so far carried out in this region and a complete recapitulation would easily be much longer. Nevertheless, some points are worth stressing.

Firstly, there does not seem to be a clear correspondance between the appearance or disappearance of the Middle Palaeolithic industries and the climato-chronologic deep-sea isotope stages. Acheulo-Yabrudian industries, for example, begin within Sage 6 and disappear sometime within Stage 5, assuming that the Uranium series dates from Zuttiyeh and El-Kowm are acceptable. Moreover, the "Middle/Upper Palaeolithic transition" falls within the early part of Stage 3 though in many caves geological disturbances have blurred much of the stratigraphic record of this critical period (LAVILLE and GOLDBERG, 1987).

Secondly, we see that the record of environmental changes in the Eastern Mediterranean is not well enough dated to be neatly correlated with the Isotope Stages. It is a dangerous practice to assume that isotopic manifestations of climatic change that are correlable with those from glacial advances in the temperate regions have their exact counterparts in subtropical terrestrial deposits. This cautionary note is certainly not new but bears repeating in light of the still current practice of making such "glacial/pluvial" correlations.

Finally, there seems to be an evident chronological discrepancy between the earliest Mousterian manifestations in Northeast Africa and Western Europe, and the Levant. Although this situation is as yet not explainable in a reasonable way, it nevertheless calls for more cross-regional comparisons and considerably greater investments in dating prehistoric sites from these areas.

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FIGURE 1

Location map showing places mentioned in the text