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## **The archaeology of Jebel Gharbi (Northwest Libya) and the Libyan sequence**

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The Jebel Gharbi, also known as Jebel Nefusa, is a vast crescent-shaped area ranging from the coast near Leptis Magna eastwards, to Nalut. It lies on the boundary between two morphological elements (Fig. 1): the southern portion of the Gefara coastal plain to the north, and the Tripolitanian Plateau to the south. The coast is nowadays ca. 100 km away.

The Jebel Gharbi represents the most northern and highest part of the Plateau (max. height: 750 m) and is characterized on the northern side by a steep escarpment, up to 300-350 m in height. The Jebel is cut by a network of deep wadis draining towards the Gefara plain. In the course of the last forty years the area has been sporadically explored through a few surveys (Fabbri & Winorath-Scott 1965; del Fabbro 1968; Mrázek & Svoboda 1986). The only stratigraphic sequence was identified in the Tarhuna (Neuvillie 1956; Jelinek 1982) and in the Wadi Ghan regions (Mc Burney 1947; Mc Burney & Hey 1955; Hey 1962).

Research by the Joint Libyan-Italian Archaeological Mission started in 1989 and continued in 1990, including both geo-archaeological surveys and test excavations<sup>1</sup>. The aim of the project is to reconstruct the palaeoenvironment and the archaeological sequence of the Jebel Gharbi region, in order to understand the correlation between natural resources and human settlement during the Pleistocene and the Holocene. In both seasons the exploration was concentrated on the Jado (Wadi Ain Zarga, Hosha Ginnauin) and the Gharian (Wadi Ghan) areas, situated respectively in the central-western and the central-eastern portion of the Jebel Gharbi, at a distance of approximately 100 km one from the other (Barich & Anag 1989; Barich et al. 1990; Barich et al. in press).

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<sup>1</sup> The Archaeological Mission in the Jebel Gharbi is part of a Libyan-Italian Joint Project between the University of Rome "La Sapienza" and the General Director of Antiquities of Libya. Barbara E. Barich and Giuma El Anag are the co-directors. The 1989 and 1990 campaigns were held with the participation of: C. Capezza, C. Conati Barbaro, C. Giraudi, B. Marcolongo, E. Barich, F. Lugli, S. Sassi El Hais, I. Salah El Azabi, S. Ali Hattab, M. Abu Gela, T. Abd Innabi. The drawings in this paper are by G. Carboni, University of Rome "La Sapienza".

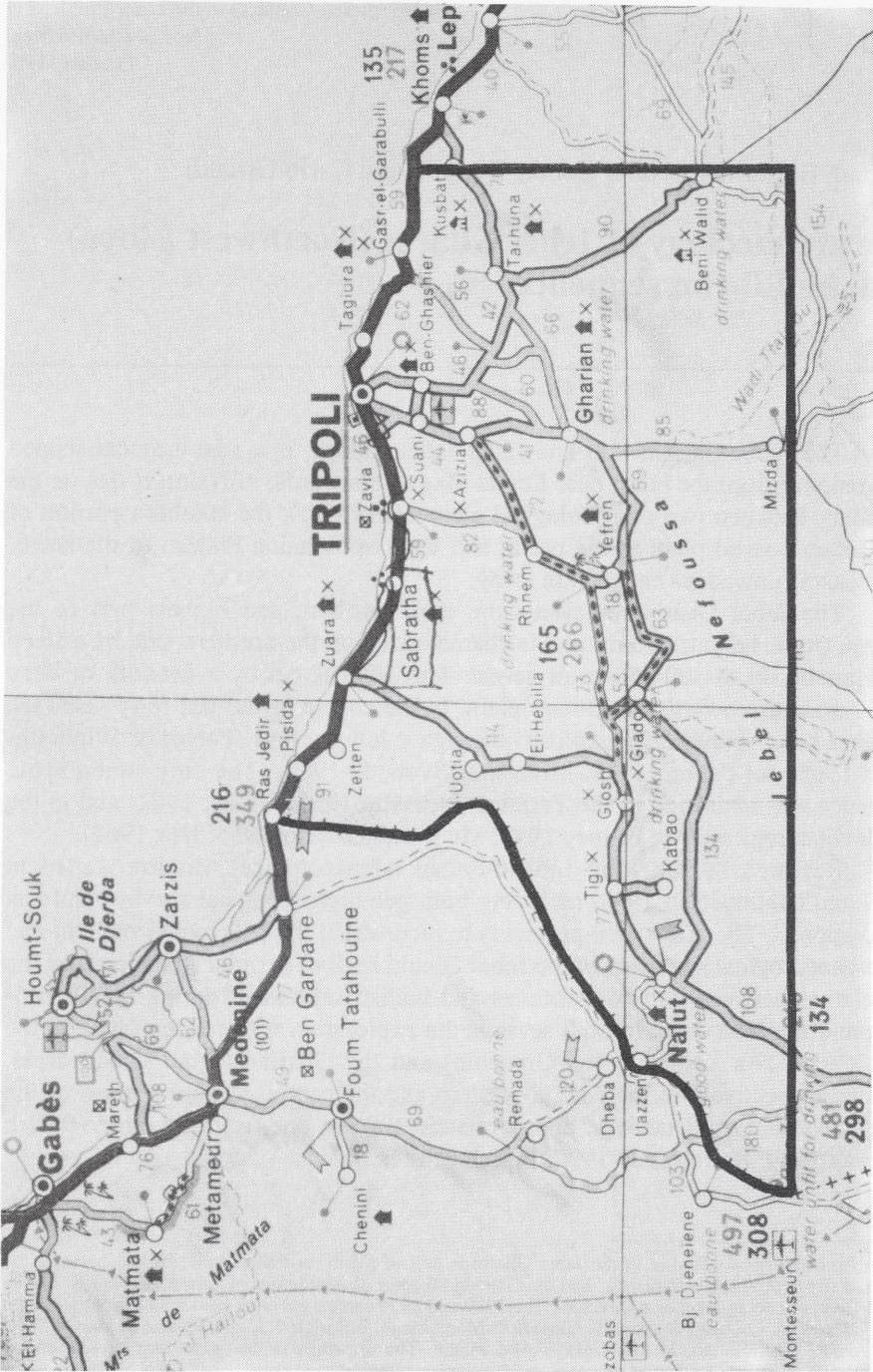


Fig. 1. Map of Tripolitania showing the Jebel Gharbi area.

## The Jado area

This area consists morphologically of three main features: Plateau, deep-cut valleys and alluvial floor valleys. For two thirds of their length the deep-cut valleys are devoid of any fluvial sediments, but in their terminal stretch and in the link with the Gefara plain they show a series of terraces. Colluvial, debris and landslide deposits often occur on the valley slopes and on the escarpment bordering the plateau. The sequence of Pleistocene deposits found on the Plateau indicates that the recent sedimentation of the area is due mainly to eolian activity.

The Plateau is covered by silts of aeolian origin containing calcareous concretions which have been deposited in at least three episodes. The sediments have undergone three pedogenetic phases. Today the Plateau vegetation is of a steppe type.

## The Ain Zarga valley

The Ain Zarga river is the major watercourse of the Jado region. It flows in an east-west direction, reaching the Gefara plain near the village of Hosha Ginnauin. The river bed is deeply cut into a limestone formation. Along its course on both flanks, there are many rock shelters at different heights above the wadi bed.

Most of the tributary valleys are now filled with landslide and colluvial fine deposits. The stratigraphy of these valleys shows a sequence of silty deposits containing Aterian artifacts (AZ3)<sup>2</sup> and with Epipalaeolithic materials on its surface. The silty deposits lie on a palaeosol containing Middle Palaeolithic artifacts of Levallois tradition (AZ2). Beneath the palaeosol there is a silty formation (AZ1). This stratigraphy could be interpreted as colluvia of silts of aeolian origin, while the palaeosols are an indication for a good development of plant cover and for morphological stability.

Archaeological surveys have been conducted along the whole course of the Wadi Ain Zarga. Both sides of the river appear to be rich in archaeological sites. Nevertheless the section closer to the headwater (Ras el Wadi) seems to be the most preserved area. Here some open-air sites were identified, ranging from Middle Palaeolithic, to Epipalaeolithic times. The lithic materials collected in site SJ-90-12<sup>3</sup> consist of artifacts both of Levallois and Aterian tradition (Fig. 2: 2, 4). Site SJ-90-13 is characterized by Epipalaeolithic artifacts associated with some hearth remains. The collection was undertaken on a area of 36 sqm covered by a grid of 2x2 m, which is clearly the exposed surface of an *in situ* anthropic deposit. The presence of backed bladelets, which represent the most common tool class, of segments, piquants trièdres and of the frequent use of the Ouchtata retouch (Fig. 3), allows for the placement of the assemblage in an Ibero-maurusian facies (Eastern Oranian or Eastern Iberomaurusian) also attested in

<sup>2</sup> This type of code, as well as the others in the text, refers to the geomorphological study by C. Giraudi.

<sup>3</sup> This type of code refers to the Mission Archive for archaeological sites.

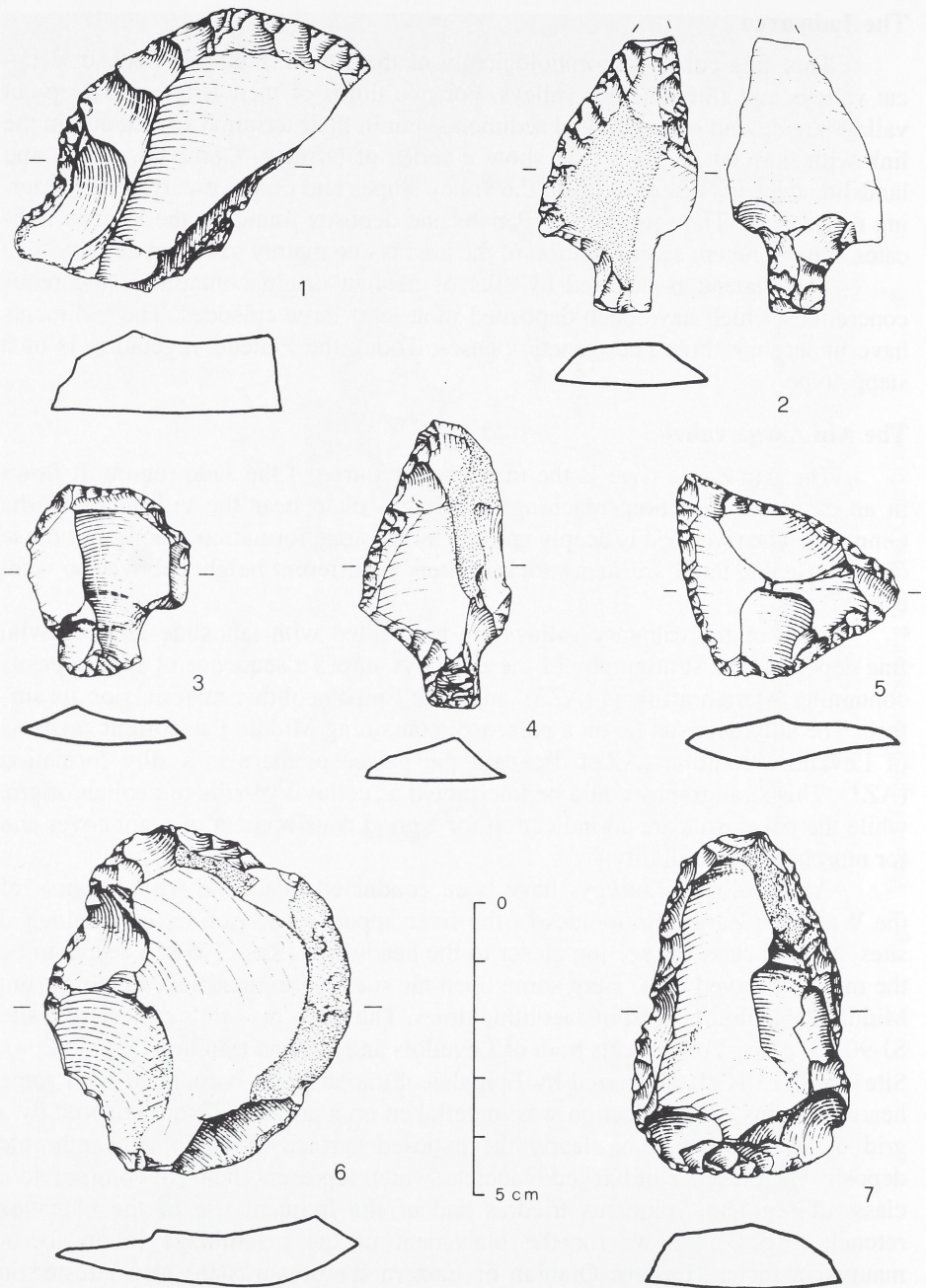


Fig. 2. Jebel Gharbi (Libya): Middle Palaeolithic artifacts from Jado and Garian areas: 1, 7 end-scrapers; 2, 4 Aterian points; 3, 5, 6 side-scrapers.

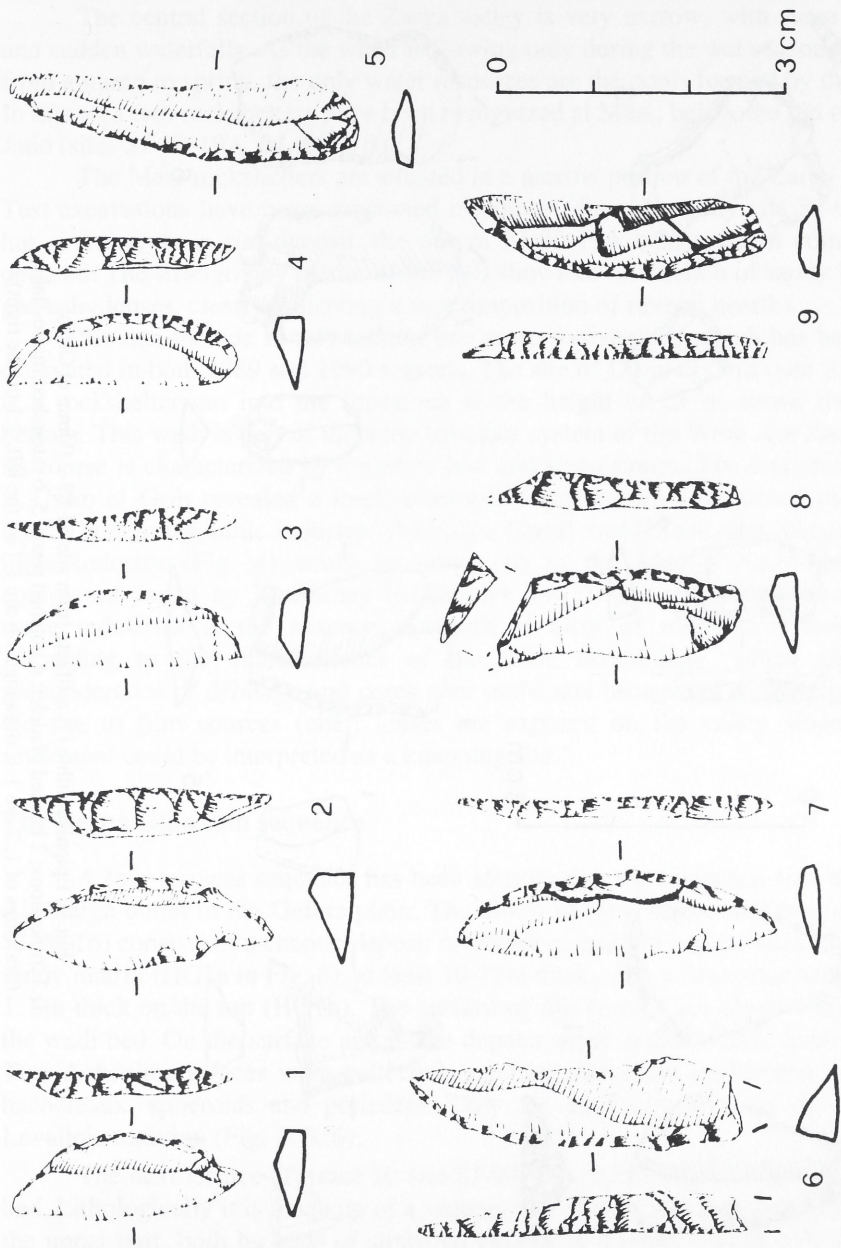


Fig. 3. Epipalaeolithic artifacts from site SJ-90-13 in the Ain Zarga valley: 1, 4; segments; 5 bladelet with Ouchtiata retouch; 6, 7; backed bladelets; 8 truncated backed bladelet.

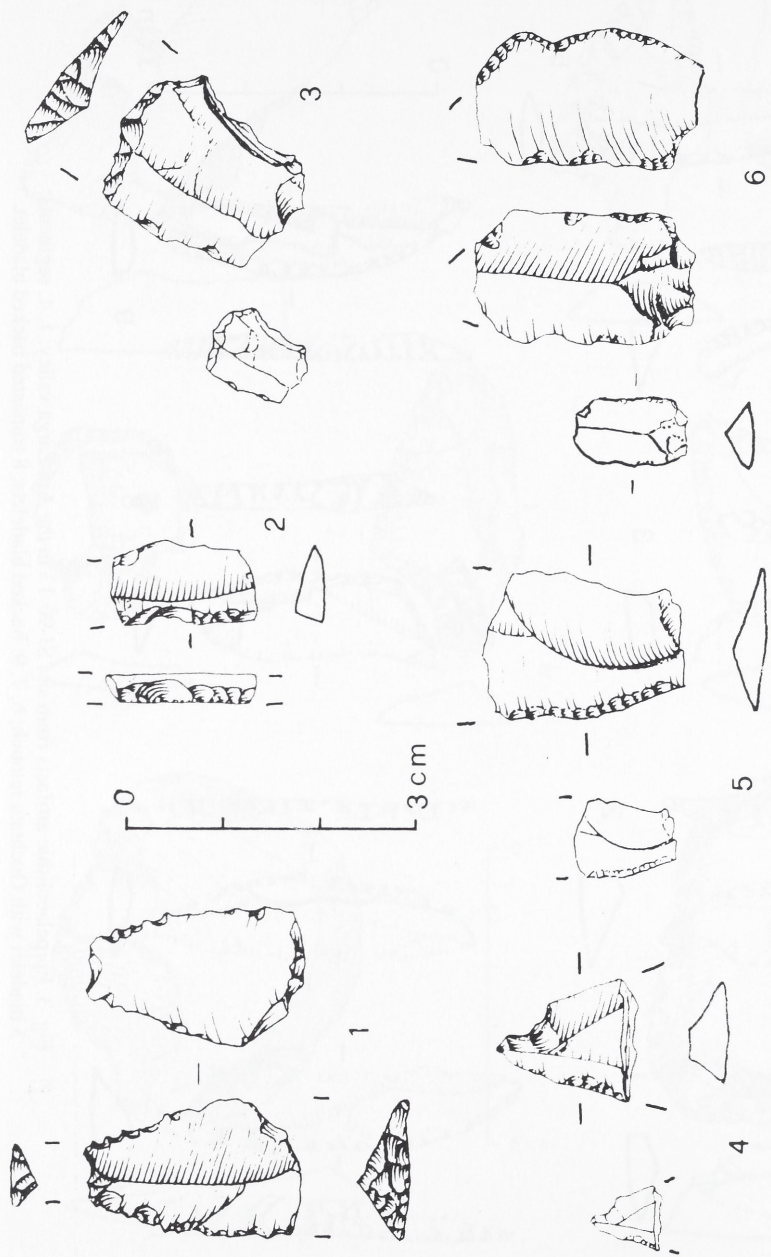


Fig. 4. Epipalaeolithic (?) artifacts from site SJ-89-2 (Umm el Grib):  
 1, 3 truncations; 2 backed bladelet; 4 notched piece; 5, 6 retouched micro-flakes  
 (drawings of 1, 2 are 1:1; drawings 3-6 are 1:1 on the left, 2:1 on the right).

two other important sites of Libya: Haua Fteah (McBurney 1967) and Hagfet-et-Tera (Petrocchi 1940; Montet-White 1958-61).

The central section of the Zarga valley is very narrow, with steep slopes and sudden waterfalls. As the water is flowing only during the wet season, mainly from autumn to spring, the only water resources are the pools formed by the falls. In this area two rockshelters have been recognized at Masr, below the old town of Jado (sites SJ-90-19A, SJ-90-19B).

The Masr rockshelters are situated in a narrow portion of the Zarga valley. Test excavations have been conducted in both of them, but only site SJ-90-19B has revealed an *in situ* deposit, the one of SJ-90-19A being almost completely deflated. The stratigraphy of site SJ-90-19B shows an alternation of sandy levels and ashy lenses, clearly indicating a superimposition of several hearths.

We can include in this section one more rockshelter, which has been test excavated in both 1989 and 1990 seasons. The site of Umm el Grib (site SJ-89-2) is a rockshelter cut into the limestone at the height of 25 m above the wadi bottom. This wadi is part of the wide tributary system of the Wadi Ain Zarga and its course is characterized by a narrow bed and steep slopes. The test excavation at Umm el Grib revealed a thick anthropic deposit, with a sequence of sandy levels, containing lithic industry, charcoals, faunal and botanical evidences. The lithic industry (Fig. 4) could be compared to the Marble Arch and Sirte complexes found by McBurney (McBurney 1947). The main difference with those industries is the absence at Umm el Grib of microburin technique. According to the characteristics of the lithic assemblage, which shows a preponderance of débitage and cores over tools, and because of the proximity of the site to flint sources (chert lenses are exposed on the valley slopes), the settlement could be interpreted as a knapping site.

### The Hosha Ginnauin sequence

A four terraces sequence has been identified in the Ginnauin area near the Ain Zarga outlet in the Gefara plain. The oldest of these terraces (Terrace I: site SJ-90-16) consists of a chaotic deposit of boulders, cobbles and pebbles in a silty-sandy matrix (HG1a in Fig. 5), at least 10-12m thick, with a limestone crust up to 1.5m thick on the top (HG1b). The surface of this terrace lies about 15m above the wadi bed. On the surface and in the deposit many artifacts have been found. Two Acheulian bifaces were collected, together with other implements such as hachereaux, spheroids and polieders. They are associated to later artifacts of Levallois tradition (Fig. 2: 3, 6).

The next terrace (Terrace II: site SJ-90-15/1) lies 7 to 8 m above the wadi bed. Lithologically it is made up of a sequence of alluvial deposits represented, in the upper part, both by beds of stratified gravels in a sandy matrix, and by pebbles and boulders in a sandy-silty structureless matrix (HG2b). In the lower part the deposits are mainly silty but they have layers of fine gravel, also of alluvial

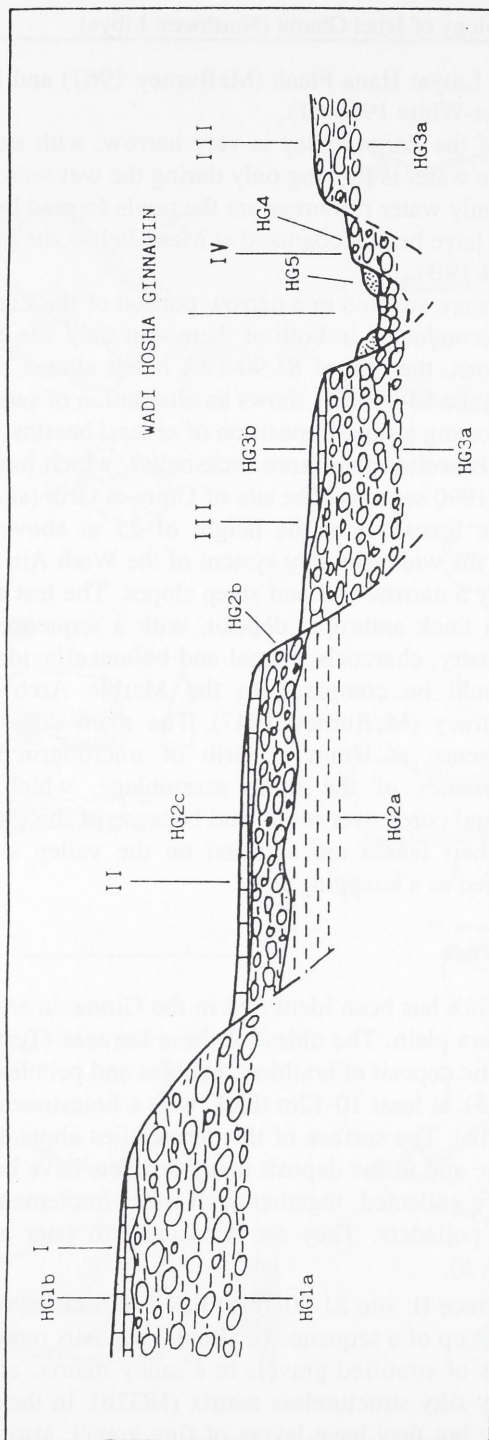


Fig. 5. Geomorphological stratigraphy at Hosha Ginnauin.  
 HG1b, HG2c, HG3b: limestone crust; HG1a, HG2b, HG3a, HG4: coarse alluvial deposits (pebbles, cobbles, boulders);  
 HG2a: fine alluvial deposit; HG5: eolian sand deposit.



origin (HG2a). The surface of Terrace II has a limestone crust (HG2c) whose thickness may be more than 0.5 m. On this surface Middle Palaeolithic artifacts of Levallois tradition are present (Fig. 2: 5, 7).

Terrace III (site SJ-90-15/2) lies at about 4 to 5 m above the wadi bed. It consists of a chaotic deposit of boulders, cobbles and pebbles in a silty-sandy matrix similar to the Terrace I deposit (HG3). On the terrace surface there is a discontinuous limestone crust with a maximum thickness of 30-40 cm (HG3b). Middle Palaeolithic artifacts of Levallois tradition are present inside the deposit associated with a few cores for blades (site SJ-90-15/3).

A number of later terrace remnants, lying 1.5 to 2 m above the wadi bed, form terrace IV. It consists of a deposit of pebbles and boulders in a sandy-silty matrix with a chaotic structure (HG4), which does not contain any archaeological evidence.

### The Garian area

Investigations in this area have been focused on the upper and lower valleys of Wadi Ghan, the major river of the region. During the 40's and 50's the area was surveyed by McBurney and Hey (McBurney 1947; Hey 1962), who outlined a geo-archaeological sequence, which is still a reference point for the archaeological framing of the Jebel.

From the geological point of view the Garian area is more complex than the Jado one. Clear remains of volcanic activity of the Upper Pleistocene age have been observed. Endogenic factors, as volcanism and tectonics, could have affected the environmental development, together with climatic factors.

In the upper part of the Wadi Ghan valley three terraces have been recognized, the last two also recognized by Hey (1962). The older terrace (Fig. 6a) can be interpreted as an erosion surface of lava-flow covering alluvial deposits. We found Middle Palaeolithic artifacts of Levallois tradition inside the alluvial deposit (Fig. 2:1). The second terrace (Fig. 6b) consists of silts, probably the result of the aeolian silts of the Plateau, which rest on a deposit of alluvial origin (mudflow) also containing Middle Palaeolithic artifacts<sup>4</sup>. On the silty terrace of Wadi Ghan a younger industry is superimposed over the mid-Palaeolithic horizon. It was defined as "late facies of the Upper Capsian" by McBurney (McBurney & Hey 1955: 272) who later on revised this definition proposing its attribution to the same Oranian sphere as Haua Fteah and Hagfet-et-Tera.

The third terrace (Fig. 6b) consists of gravels intercalated with sandy-silty beds of alluvial origin. According to Hey (1962) the terrace could be dated from after the 4th century A.D.

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<sup>4</sup> This is actually the "higher terrace" of Hey (1962). Hey reported the presence, inside the mudflow deposit of Aterian artifacts, which we have not found yet.

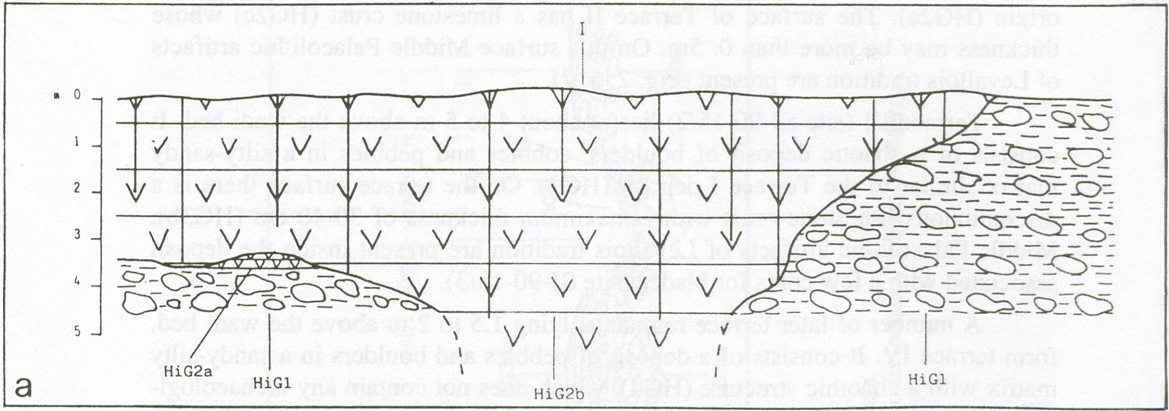


Fig. 6a. Terrace I in the Upper Wadi Ghan valley:  
HiG2b: lava; HiG2a: volcanic ash; HiG1: alluvial deposits.

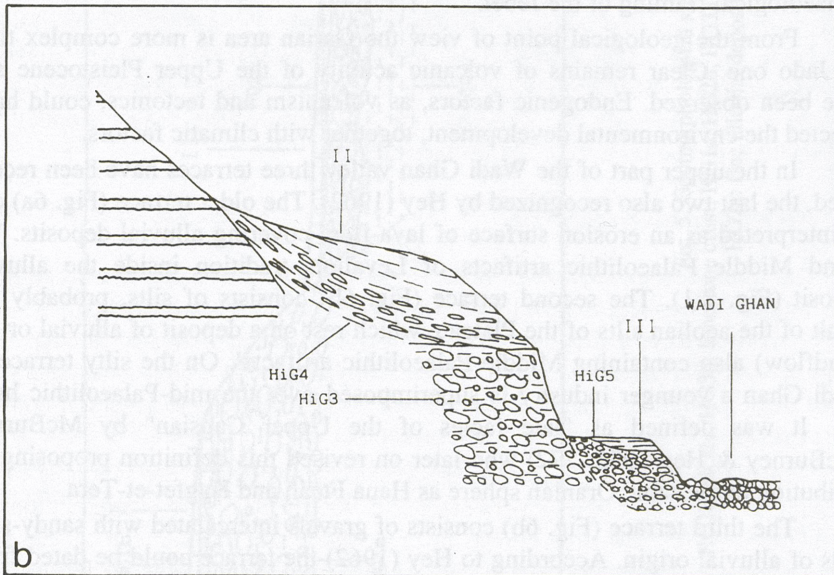


Fig. 6b. Terraces II and III in the Upper Wadi Ghan valley:

HiG4: silts of aeolian origin  
HiG3: alluvial deposit (mudflow)  
HiG5: alluvial deposit.

Again three terraces have been detected in the lower Wadi Ghan valley. The first one consists of a complex sequence of alluvial and colluvial deposits and lava flows covered by a limestone crust. Middle Palaeolithic artifacts were collected on its surface. The other two terraces are made up of alluvial deposits.

The correlation between the sequences of both parts of the Wadi Ghan valley cannot be demonstrated yet, as well as the correspondence between the terraces and climatic changes. This is mainly due to the already mentioned late Pleistocene volcanic and tectonic activity.

## Discussion

The two first seasons in the Jebel Gharbi have provided a remarkable amount of geomorphological and archaeological evidences, which allow us to sketch a palaeoenvironmental and archaeological reconstruction of this region.

According to the geomorphological observations, different climatic phases have been recognized during Upper Pleistocene and Holocene times. An older phase, dated to the Upper Pleistocene, was characterized by an arid climate, with rare precipitations of great intensity (mudflow, debris flow: HiG1, HiG3, HiG3a; colluvia: AZ1). It is followed by a humid episode with fairly regular rainfall as soils development (AZ2) and watercourse erosion (terracing of surface 3 at Hosha) testify.

A single phase, with extremely arid climate covers the final part of the Upper Pleistocene (soil deflation on crust HG3b; colluviation: AZ3, HiG4; gelifraction: HiG4). This could be related to the post-Aterian phase dated in the North Africa from about 30 000 to 15 000 B.P. In fact, Epi-Palaeolithic artifacts were found only in the deposits attributed to the final part of this phase. This HiG4: silts of aeolian origin; HiG3: alluvial deposit (mudflow); HiG5: alluvial deposit could mean that the area was not always favourable to human settlement and that it was occupied again when the climate became less arid.

The transition to the Holocene is marked by a climatic amelioration as indicated by a relatively wet phase with regular rainfall (development of soils: AZ3a; river erosion [surface of second terrace of Upper Wadi Ghan]). This should correspond to the phase of the re-occupation of the area, attested by the sites of Ain Zarga headwater. Absolute dating of the site SJ-90-13 could confirm a possible chronology of 14 000-13 000 B.P.

The archaeological sequence detected in Jebel Gharbi will be able to fill the gap of evidence existing between the Eastern and the Western regions of North Africa. Until now this role has been played by the Haua Fteah cave, which however presents some peculiar aspects. Here the Aterian seems to be replaced by the Mousterian which lasted until the first appearance of an Upper Paleolithic industry called Dabban (40 000 B.P.). On the contrary, the Jebel Gharbi sequence shows a clear continuity from the Levallois tradition to the Aterian, often found in stratigraphic succession.

As far as the Late Pleistocene and Early Holocene are concerned, the Ain Zarga and Wadi Ghan evidences could confirm the revision of the Libyco-Capsian horizon suggested by Close (1986). A sensible difference in types and incidence of types between the Capsian and the coeval Libyan industries (namely the layer X at Haua Fteah) has been pointed out: therefore it would seem more appropriate to include that layer in the the cultural context of the Iberomaurusian *sensu lato*. At the end of Pleistocene this cultural sphere spread over the North Africa, from the Nile Valley to the Western regions, in connection with the first appearance of the mechoide human type. According to Close "there seems, throughout much of the Late Palaeolithic and Epipalaeolithic of North Africa, to be a basic, Iberomaurusian-like substratum, which first appears across the whole North Africa within a very short period of time" (Close 1986: 175).

Moreover, the considerable distance from the coast (ca. 100 km) of the Jebel Gharbi could confirm Mc Burney's hypothesis of a gradual migration towards the inner regions of Iberomaurusian groups otherwise well adapted to the coastal environment. The medium height zones seem to be the most preferred inhabitation areas, such as the Atlas and, according to the new evidence, the Jebel Gharbi. The Plateau region was a rich environment suitable for the exploitation of a wide range of resources, such as game, plants and raw materials<sup>5</sup>. Evidently, the subsistence and technological model adopted by the Final Pleistocene-Early Holocene groups should have been a successful one, as it lasted for such a long time. Starting from this promising evidence, the future investigations of the region will focus on the first appearance of early food production, which likely seems to have been developed as a local process.

At the end of the first research cycle that we have reported here, we can conclude that the Jebel Gharbi region can allow for a reconstruction of the whole prehistoric sequence from the Lower Palaeolithic to the Neolithic. In a wider perspective, we can also assume that the future research will support an idea of both spatial and temporal continuity in the sequence of North African prehistory, until now inhibited by inadequate investigations.

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<sup>5</sup> In the Jebel are present two main formations containing chert, namely the Nalut one (mainly exploited by Middle Palaeolithic groups) and the Wadi Thamat one (very likely preferred by Epipalaeolithic and Neolithic groups).

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