Cultural Markers in the Later Prehistory of Northeastern Africa and Recent Research
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The Ras El Wadi sequence in the Jebel Gharbi and the Late Pleistocene cultures of Northern Libya

The reconnaissance work: Gharian and Jado

The Jebel Gharbi is located in the northern part of the Tripolitanian Plateau (Fig. 1). It is cut by a series of valleys draining northwards into the Jefara plain and has several water springs. An escarpment forms the northern border towards the plain. The research project of the University of Rome "La Sapienza" in the Jebel Gharbi has been conducted in two areas: in the Wadi Ghan, in the Gharian territory, which is already known from McBurney's fieldwork carried out in the '40s (McBurney and Hay 1955), and in the territory of Jado, currently

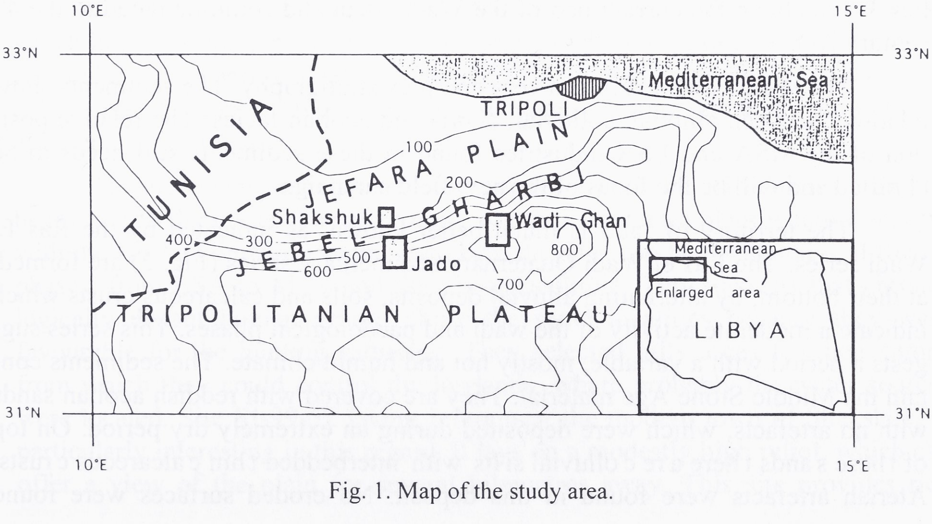


Fig. 1. Map of the study area.

the administrative centre of Jebel Gharbi. Both areas have shown traces of intensive human occupation. On the whole, we recorded and mapped more than 50 prehistoric sites dating to the Early, Middle and Later Stone Age (Lower Middle and Upper Palaeolithic) as well as to the Neolithic; several these latter sites yielded potsherds of prehistoric manufacture.

In both regions human occupation developed along the two main water streams: Wadi Ghan and Ain Zargha. Open-air sites are located on the hilly flanks currently covered by a sparse shrub vegetation with numerous olive trees. The sites are located in a dominating position, which allowed to control the access to water resources located at a short distance downhill (Barich 1995; Barich et al. 1995; Barich et al. 1996).

Geographical and geomorphological features

From a geomorphological point of view, the Gharian and Jado regions show consistent differences (Giraudi 1995). The Wadi Ghan, particularly in its upper part, shows a sequence of three terraces located at different heights. The first one, several metres above the wadi bed, is an eroded surface of volcanic and alluvial deposits. The second, about 20 m above the valley bottom, is mainly formed of silts which mostly consist of quartz of non-local origin. These silty sediments cover a deposit, at least 10-12 m thick, consisting of a chaotic accumulation of boulders and pebbles in a silty-sandy matrix. This deposit, of alluvial origin, was formed through typically mud-flow processes, and contains MSA (Middle Palaeolithic) artefacts of Levallois tradition. On the other hand, the silty sediments contain LSA (Late Palaeolithic) and Epi-palaeolithic materials. Here are also later, Neolithic artefacts associated with pottery. The third terraced area lies 3-4 m above the current bed of the Wadi Ghan and could be dated to the 4th century AD.

The Wadi Ghan exhibits a very complex stratigraphy. The sediments show relations between alluvial, colluvial, debris and aeolian facies. The relative position of the MSA and LSA industries found in these sediments still needs to be clarified and will be the focus of the next field campaign.

The territory of Jado is much better known, as indicated by the Ras El Wadi series. The Ras el Wadi Quaternary sedimentary series (Fig. 2) are formed, at their bottom, by alternating alluvial deposits, soils and calcareous crusts which indicate a moderate activity of the wadi and paedological phases. This series suggests a period with a variable, mostly hot and humid climate. The sediments contain the Middle Stone Age material. They are covered with reddish aeolian sands with no artefacts, which were deposited during an extremely dry period. On top of these sands there are colluvial silts with interbedded thin calcareous crusts. Aterian artefacts were found in this deposit. No eroded surfaces were found

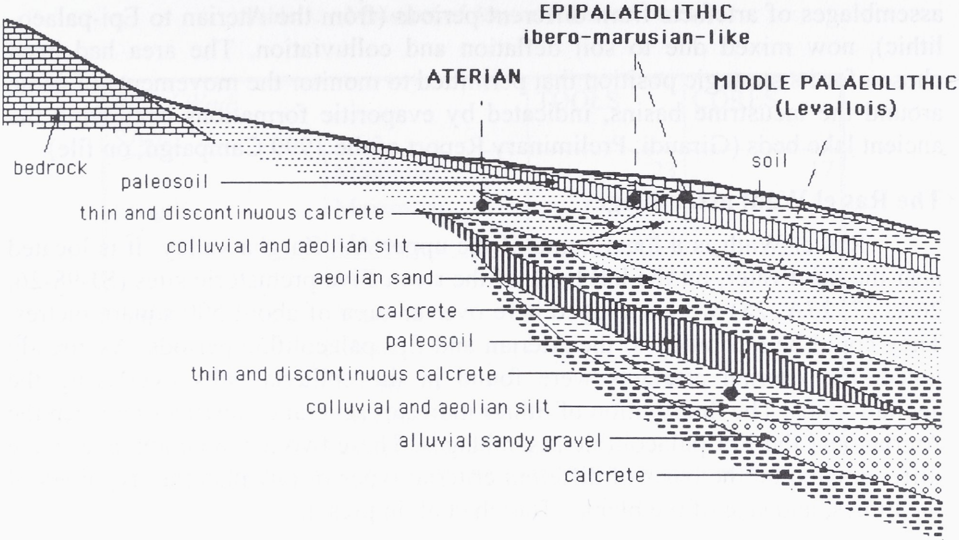


Fig. 2. The Ras el Wadi Quaternary sedimentary series.

within the silt deposits. Therefore, the sediments must have been deposited during a period of weak geomorphological activity. During the Aterian occupation the loess was deposited and was reworked by rillwash on the slopes. The climate was not completely dry; there were some precipitations.

On top of the sediments with Aterian artefacts, there is a small crust, which indicates an increase in humidity and a high evaporation rate. The crust is covered by other colluvial silts containing LSA (Upper Palaeolithic) materials. A soil forms the top of the series. Subsequently, strong erosion and gullying affected the sediments.

The archaeological sites are concentrated around the Ain Zargha, from the headwater to the outlet. The river flows towards the Jefara plain where it merges with the Hosha Ginnaun stream. Also here the sites can be attributed to different phases, from ESA to MSA and the Epi-palaeolithic. This suggests that chronologically distant human groups chose the same localities because they were favourable for the hunting-gathering. They selected hilly areas for their camps from which they could control the lowlands, where probably the water sources were located. Site SJ-99-52 facing Jefara near the modern town of Shakshuk, is particularly interesting in this regard. It lays on a modestly high relief, which can offer a view of the plain for several kilometres away. This site provides rich assemblages of artefacts from different periods (from the Aterian to Epi-palaeolithic), now mixed due to soil deflation and colluviation. The area had been chosen for its strategic position that permitted to monitor the movements of game around the lacustrine basins, indicated by evaporitic formations occupying the ancient lake beds (Giraudi, Preliminary Report of the 1999 Campaign, on file).

The Ras el Wadi assemblages

Ras el Wadi is a local name of the upper Ain Zargha valley. It is located near the headwater, on the left bank of the river. Five prehistoric sites (SJ-98-26, 26A, 27, 27A, 28) were surveyed here over an area of about 500 square metres. They could be attributed to the Aterian and Epi-palaeolithic periods. As already noted, the Aterian artefacts were found in the colluvial silts overlaying the aeolian sands. The distribution of lithics indicates several differences between the Aterian and the Epi-palaeolithic assemblages. These two techno complexes were differentiated on the basis of different criteria: types of raw material, typology of the lithics, and size of the blanks (Barich et al. in press).

Raw materials

Raw materials were flint and quartzite. Flints could be available locally, or they come from one of the outcrops in the area. Two major sources of flint are present in the Jebel Gharbi. One of them is located to the west, near Nalut, in the Nalut Formation (Turonian) (Novovic 1977). The flint nodules from this area usually do not exceed a length of 5 cm (Mrazek and Svoboda 1986). The other flint source is situated in the eastern part of the mountain range, near Tarhuna (Mann 1975). These nodules can be bigger, measuring up to 10 cm in length (Mrazek and Svoboda 1986). Considering the location of Ras el Wadi and the size of our lithic specimen, it seems more probable that flints originate from the western, closer source, some 100 km from the site.

By the end of the Pleistocene, intensive mining activities took place in the Ras el Wadi area. Nodular flint outcroppings were exploited as it is documented by several niches cut into the limestone layers along the river banks. The extracted flint belongs to the type used most frequently at the Epi-palaeolithic and Neolithic sites. Quartzite showed less fresh edges. It was extremely rare and it was not locally available.

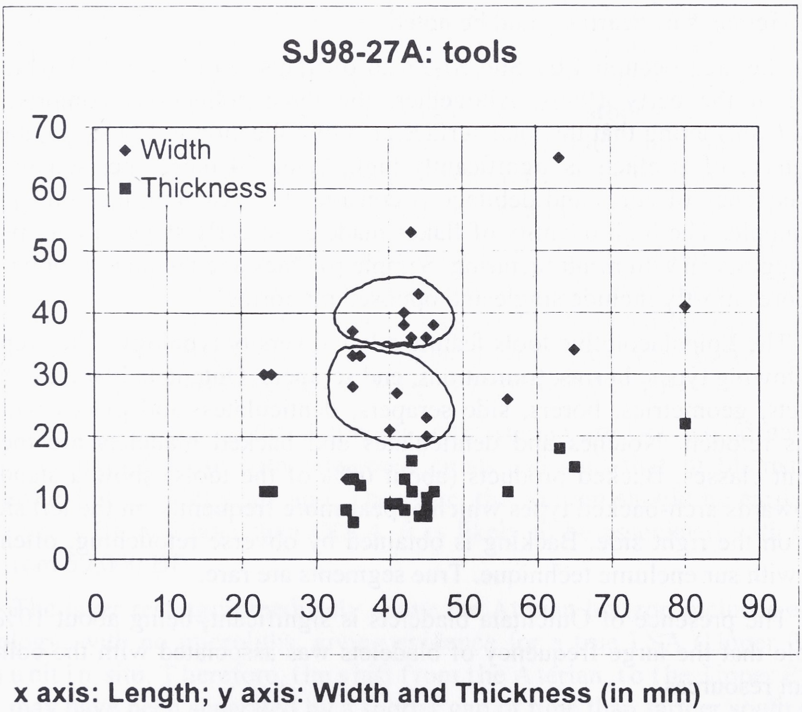
The Aterian

Site SJ-98-27A was selected for systematic surface collecting, after a preliminary sampling made earlier, which produced a typical pink-grey striped flint, a type primarily used by Aterians. Cores from this site exhibit two techniques: Levallois (3 specimens) and opposed platforms (3 specimens). The Levallois cores are larger. The tool-kit from this site includes: Levallois flakes, a scraper

Table 1. – Measures of Aterian tools and cores.

Ras el Wadi SJ98-27A		TOOLS	CORES
Length	Minimum	23	17
	Maximum	80	56
	Mean	45,2	33,3
Width	Minimum	13	12
	Maximum	65	61
	Mean	33,7	27,5
Thickness	Minimum	6	6
	Maximum	22	24
	Mean	11	15,9

Table 2. Widths and thicknesses related to lengths of Aterian tools.



limace, a truncation, an opposed platform core that was reused as a burin, sidescrapers, notches and denticulates, (most frequent tool class), a tranchet and numerous tanged tools.

In general, tools are larger than cores (Tables 1 and 2). This is in line with the "reduction percentage" calculated by P. Van Peer (1991) who noted that, practically in the whole of North Africa, only and all Aterian sites - apart from rare exceptions - feature Levallois flakes larger than Levallois cores.

Aterian tools were usually quite wide and thick. Their width was often near or equivalent to the length (Table 2).

The Epi-palaeolithic

Sites SJ-98-26 and SJ-98-26A represent the Epi-palaeolithic horizon in Ras el Wadi. These two assemblages are located not far from each other and could had been even part of the same habitation. They cover the hilly flanks of the upper course of the Ain Zargha (no more than 30 m from the present river bed), over a 100-m long area. The lithic material was systematically collected by 1 x 1 m grids, in two areas of 8 x 5 m and 4 x 12 m, respectively.The artefacts show rather fresh surfaces, suggesting that they have not been long exposed and that the archaeological deposit was not affected by strong alterations. Nevertheless, no remains of hearths could be noted.

The area occupied by Site SJ-98-26 overlaps with Site 90/13 which was studied in the early 1990s. Altogether, the three collections comprise 4323 pieces. Considering that the total surface area of collection is 124 sq. m, the average density of artefacts is significantly high, being 34 pieces per square metre. The frequency of cores and debitage is considerable, reaching up to 80% of the total sample. The high quantity of flakes made at an early stage of core preparation suggests in situ manufacturing. Simple pebbles are frequent among cores. True cores mostly include single and opposed platforms.

The Epipalaeolothic tools feature a low diversity typology. They represent the following types: burins, truncations, end scrapers, Outchtata bladelets, backed bladelets, geometrics, borers, side scrapers, denticulates, and pieces with continuous retouch. Notches and denticulates and backed bladelets are the most frequent classes. Backed products (about 60% of the tools) show a standardisa tion towards arch-backed types which appear more frequently on the left side and rarely on the right side. Backing is obtained by obverse retouching, often combined with sur enclume technique. True segments are rare.

The presence of Outchtata bladelets is significant, being about 10%. It is possible that the large frequency of bladelets was associated with the collection of plant resources.

The Epi-palaeolithic assemblage from Ras el Wadi is largely similar to two other Libyan Epi-palaeolithic complexes: Haua Fteah (McBurney 1967) and Hagfet et Tera (Petrocchi 1940; Montet-White 1958-61).

The wadi system occupation in the final Pleistocene

The sites from Ras el Wadi could illustrate the development of human occupation in the Jebel Gharbi. The numerous Aterian sites, clustered in a limited space, suggest that they must have had great relevance in the area. Aterian hunters may had used the plateau edges and the less steep slopes near the perennial springs, such as the Ain Zargha. Water springs were surly an important attraction for game, even though no animal remains were found at the sites. However, at similar sites, like Haua Fteah, the presence of *Ammotragus lervia, Gazella dorcas, Alcelaphus*, and perhaps also rhinocero and auroch were recorded (Higgs 1967). The vegetation in the wadi must have also benefited from a moister climate, featuring primarily shrubs with a few trees.

Calcareous concretions, and particularly pedogenetic carbonate crusts, were sampled from the Ras el Wadi sites. Samples were collected for ^{13}C and ^{18}O stable isotope content, chemical, and mineralogical analysis (X-ray diffraction) for palaeoclimatological and palaeoenvironmental information. The first results confirm a pedogenetic origin of the carbonates. Soil carbonate forms under sub-humid to semi-arid conditions, in relatively dry soils, where grasses or mixed grasses and shrubs were the dominant vegetation. The carbonate was mainly originating from rising groundwater rich in dissolved carbonates, as a result of CO_2 degassing. This discontinuous process, forming thick and complex crusts, was often accompanied by carbonate precipitation due to leaching of calcium carbonate from superficial soil by downward percolating rain.

Calcareous crusts were also sampled for U/Th dating, which is still in progress. At any rate, the most humid episode, which is related to the Middle Stone Age, may correspond to oxygen-isotope stage (OIS) 5, dated between 128,000 and 71,000 years BP (Renfrew and Bahn 1996). This was followed by a hyperarid period, representing OIS 4, dated to 71,000-59,000 BP.

The crust on top of the sediments with Aterian artefacts could be correlated to the humid phase with calcareous crusts and soils that, at Matmata, are dated around 30-27,000 years ago. Therefore, the Aterian should be earlier than 30,000 years BP and later than OIS 4. It is likely to be associated with OIS 3, dated from 59,000 BP.

The layer resting immediately above the Aterian horizon includes a blade technology, with no microliths, giving evidence for a true LSA (Upper Palaeolithic) unit in situ. Therefore, the shift from the Aterian, to the Upper Palaeolithic, may have been separated by a shorter gap of time than farther south of this area. This would also support the thesis of a local evolution from a nearly Homo sapiens (Dar el Soltan II type) to the fully modern Iberomaurusian type of man. It should be also noted that soil deflation on the crusts was observed in the Wadi Ghan, suggesting an extremely dry climate. This event is related to the post-Aterian phase dated in North Africa between 30,000 and 15,000 years BP (Barich et al. 1996). Also the Maghreb must have been essentially unoccupied for some 20,000 years before the maximum of the Last Glaciation, and the Aterian is separated there from the stratigraphically overlying Iberomaurusian by a significant unconformity (Close and Wendorf 1990).

Phreatogenic calcareous crusts were also found in the Egyptian Western Desert (Pachur and Röper 1984). They indicated the presence of shallow lakes between dunes, suggesting a semi-arid climate. They were dated between 40,000 and 25,000 years BP. After that date, the region became hyperarid (Pachur et al. 1987).

In the Taforalt cave (Morocco) carbonated crusts lay on top of the Aterian deposit and mark the transition to upper sediments with Epi-palaeolithic material (Raynal 1979-80). Unfortunately, they are not dated, but the Aterian layers below the crusts gave several radiocarbon dates ranging between >40,000 BP and >32,370+2470/-1890 BP (Débénath et al. 1986; Débénath 1992).

In conclusion, there are reasons to believe that the Aterian from the Jebel Gharbi may be later than the Aterian in the present Sahara. It was followed by a LSA (Upper Palaeolithic) and later by Epi-palaeolithic and Neolithic horizons.

References

BARICH, B. E. 1995. Industrie à lamelle de la région de Jado, Jebel Gharbi: modèle typologique et occupation humaine en Libye au Pléistocène final. In: R. Chenorkian, (ed.), *L'homme méditerranéen. Mélanges offerts à Gabriel Camps*: 67-74. Aix-en-Provence: Publications de l'Université de Provence.

BARICH, B. E., G. BODRATO, E. A. A. GARCEA, C. CONATI-BARBARO and C. GIRAUDI. In press. Northern Libya in the final Pleistocene. The late hunting societies of Jebel Gharbi. Studi in onore di Lidiano Bacchielli. *Quaderni di Archeologia della Libia* 18.

BARICH, B. E., C. CONATI-BARBARO, and C. GIRAUDI. 1996. The archaeology of Jebel Gharbi (Northwest Libya) and the Libyan sequence. In: L. Krzyżaniak, K. Kroeper and M. Kobusiewicz (eds), *Interregional Contacts in the Later Prehistory of Northeastern Africa*: 37-49, Poznan: Poznan Archaeological Museum.

BARICH, B. E., C. GIRAUDI, C. CONATI-BARBARO and C. CAPEZZA. 1995. Geoarchaeology of the Jebel Gharbi Region: Outline of the research. *Libya Antiqua new series* 1: 11-35.

CLOSE, A. E. and F. WENDORF. 1990. North Africa at 18 000 BP. In: C. Gamble and O. Soffer (eds), *The World at 18 000 BP. Volume Two: Low Latitudes*: 41-57. London: Unwin Hyman.

DÉBÉNATH, A. 1992. Hommes et cultures matérielles de l'Atérien marocain. *L'Anthropologie* 96: 711-720.

DÉBÉNATH, A., J. P. RAYNAL, J. ROCHE, J. P. TEXIER and D. FEREMBACH. 1986. Stratigraphie, habitat, typologie et devenir de l'Atérien marocain: données récentes. *L'Anthropologie* 90(2): 233-246.

GIRAUDI, C. 1995. Geomorphology and sedimentology in the Ghan and Zargha Wadis and on the Jado Plateau. *Libya Antiqua new series* 1: 18-26.

HIGGS, E. S. 1967. Environment and chronology: the evidence from mammalian fauna. In: C. B. M. McBurney (ed.):16-44, Cambridge: Cambridge University Press.

MANN, K. 1975. *Geological Map of Libya, 1:250,000. Sheet Al Khuma (NI 33-14). Explanatory Booklet*. Tripoli: Ind. Res. Centre.

McBURNEY, C. M. B. 1967. *The Haua Fteah (Cyrenaica) and the Stone Age of the South - East Mediterranean*. Cambridge: Cambridge University Press.

McBURNEY, C. M. B. and R.W. HEY. 1955. *Prehistory and Pleistocene geology of Cyrenaican Libya*. Cambridge: Cambridge University Press.

MONTET-WHITE, A. 1958-61. Industrie de lamelles de Hagfet et Tera (Cyrénaïque). *Quaternaria* 5: 35-51.

MRAZEK, I. and J. SVOBODA. 1986. Lithic raw materials of the Late Palaeolithic/Neolithic industries in Jabal Nefusa, Tripolitania. *Anthropologie* 24 (1): 49-59.

NOVOVIC, T. 1977. *Geological Map of Libya, 1:250,000. Sheet Nalut (NH 32-4). Explanatory Booklet*. Tripoli: Ind. Res. Centre.

PACHUR, H. J. and H. P. RÖPER. 1984. The Libyan (Western) Desert and Northern Sudan during the Late Pleistocene and Holocene. *Berliner Geowissenschaftliche Abhandlungen (A)* 50: 249-284.

PACHUR, H. J., H. P. RÖPER, S. KRÖPELIN and M. GOSCHIN. 1987. Late Quaternary hydrography of the Eastern Sahara. *Berliner Geowissenschaftliche Abhandlungen (A)* 75(2): 331-384.

PETROCCHI, C. 1940. Ricerche preistoriche in Cirenaica. *Africa Italiana* 7, Anno XVIII (1-2): 1-33.

RAYNAL, J.-P. 1979-80. Taforalt. In: Mission préhistorique et paléontologique française au Maroc: rapport d'activité pour l'année 1978. *Bulletin d'Archéologie marocaine* 12: 69-72.

RENFREW, C. and P. BAHAN, 1996. *Archaeology: Theories, Methods and Practice.* London: Thames and Hudson.

VAN PEER, P. 1991. Interassemblage Variability and Levallois Styles: The Case of the Northern African Middle Palaeolithic. *Journal of Anthropological Archaeology* 10: 107-151.