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ATERIANS IN LIBYA

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Résumé : Le but de cet article est de démontrer l'existence d'horizons atériens chronologiquement, technologiquement et typologiquement différents, qui représentent divers groupes culturels adaptés à conditions de milieu variées dans la Libye septentrionale et méridionale. Bien que certaines techniques et outillages communs appairassent sur un territoire étendu, ils sont séparés par de dizaines de millénaires. Il est probable que les populations atériennes se sont organisées socialement de manière isolée. Un tel système pourrait expliquer la longue durée des traditions technologiques du MSA ancien à l'Atérien nord-african tardif et pourrait justifier leur diffusion à un rythme très lent sur ce vaste territoire.

Abstract: This paper aims at pointing out the existence of different chronological, technological and typological Aterian horizons in Libya, which represent various cultural groups adapted to different environmental conditions in northern and southern Libya. Even though some general techniques and tool-kits appear over a large territory, they are separated by tens of millennia. It is suggested that Aterian peoples adopted isolated forms of social organisation. Such a system could explain the conservative duration of technical traditions from the early MSA to the late North African Aterian and could justify their spread, at a very slow pace, over such a vast territory.

THE WESTERN COAST OF LIBYA

The Jebel Gharbi is a mountain range located in Tripolitania (Libya), between Tripoli to the east and the Tunisian border to the west. It is an elongated arch-shaped range lying almost parallel to the Mediterranean coast, some 60-80 km inland. Research in this area is carried out by a project of the University of Rome "La Sapienza", directed by B.E. Barich. The exploration has been concentrated in two main areas: to the east, along the Wadi Ghan, in the Gharian territory, known from McBurney's times (McBurney and Hey 1955; Neuville 1956), and to the west, around the territory of Jado and further towards the Tunisian border (Barich 1995; Barich *et al.* 1995; Barich *et al.* 1996).

THE JADO AREA

The geology of the Jado area is known from the Ras El Wadi (Giraudi 1995; Barich *et al.* in press a) and Shakshuk series (Giraudi 2000), which provide geological stratigraphies that can be related to the archaeology of the area.

At Ras el Wadi, the sediments with early, generalised Middle Stone Age materials include alternating alluvial deposits, soils and calcareous crusts, that indicate a variable, mostly hot and humid, climate.

The following formation with archaeological materials is separated by a series of reddish aeolian sands that deposited during an extremely dry period. It includes Aterian artefacts and is formed by colluvial silts with interbedded thin calcareous crusts. During this period, the climate was not completely dry and there were some precipitations.

At Shakshuk, generalised Middle Stone Age artefacts lie on the bedrock, at the bottom of the soil formation. Aterian and Later Stone Age materials were found on the surface of a terrace, including alternating sand and silt of wind origin. This surface shows an unconformity, due to an erosion or deflation phase between its formation and the successive deposit with Epipalaeolithic artefacts. Perennial ground-water springs kept flowing independently from climatic and environmental changes, at different spots around Shakshuk. One of the main ground-water springs is presently topographically indicated as Ain Shakshuk.

West of Gharian, in the lower Wadi Nalut valley, early MSA materials appear in association with a calcareous crust, confirming this association. Aeolian sands separate them from the upper deposit with Aterian artefacts (Giraudi 2000).

THE GHARIAN AREA

The geological series of the Gharian area could also be related to the archaeological evidence. The upper valley of the Wadi Ghan shows a deposit of alluvial origin with MSA artefacts. The gravels containing MSA material are covered by lava flows. Therefore, some volcanic activity continued long after the previously supposed eruptions dated to the upper Tertiary and early Quaternary (Piccoli and Spadea 1964). As these latest lava flows separate the early MSA from the Aterian deposits, they provide a relative sequence with the early MSA predating the Aterian.

THE ARCHAEOLOGICAL SITES

The Jado area exhibits numerous Aterian sites scattered throughout the region. The Aterian from this area shows a techno-typological variability that suggests chronological differences. A smaller number of sites from both the early MSA and the Aterian appear in the Gharian area.

Several assemblages are mixed with later - Epipalaeolithic - materials, but some are isolated and offer reliable

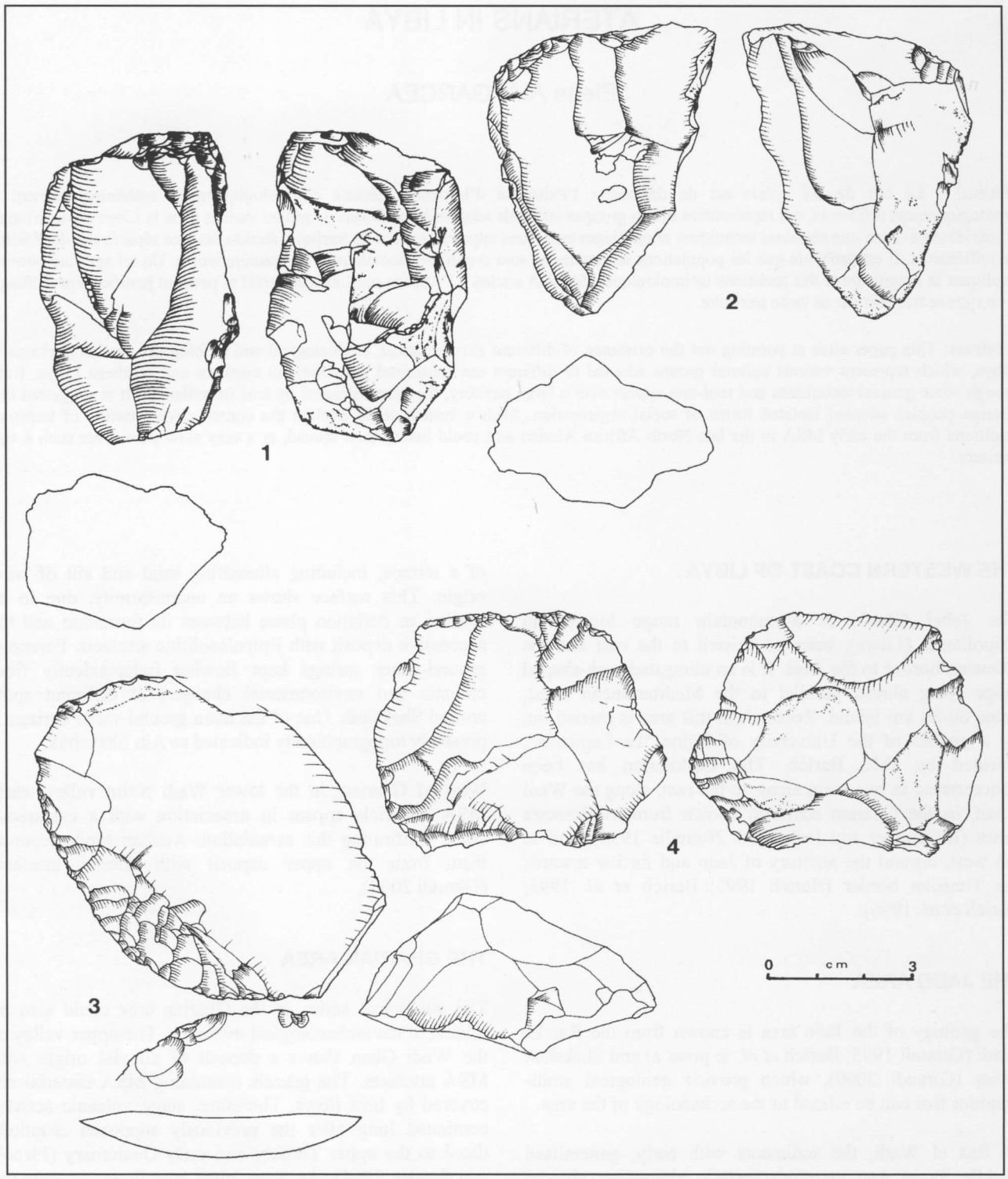

Figure 1. 1-2: Nubian cores. 3: simple convex sidescraper. 4: Levallois core.

contexts mainly for the Aterian, but also for the early MSA (Garcea *et al.* 2000).

Systematic surface collections were carried out at the best preserved sites, both in the Jado (SJ-98-27A, SJ-00-57, SJ-00-58, SJ-0058A, SJ-00-60), and in the Gharian (SG-99-41 and SG-00-61) areas. Other selective collections were made earlier (by B.E. Barich) in the Gharian area (SG-99-40 and SG-99-46). These assemblages are now related to the technological, typological and chronological data from other well-preserved complexes from the Libyan Sahara.

The early MSA in the two areas of the Jebel Gharbi is much less represented than the Aterian. This is in contrast with the evidence from the neighbouring Cyrenaica region, east of Tripoli. The early MSA, or "Middle Palaeolithic" was well attested to at both Haua Fteah (McBurney 1967) and Hajj Creiem (McBurney and Hey 1955). On the other hand, the Aterian was present at Haua Fteah, but was

attributed to a single settlement or short-term visits (McBurney 1967).

NUBIAN TECHNOLOGY

Two Nubian Type 1 cores (Figs. 1.1-2) were found in the Jado area (Site SJ-00-60). They are included in a generalised Middle Stone Age assemblage, often called North African Mousterian. This site can be considered the earliest in the MSA collections from the Jebel Gharbi. It includes an industry on large flakes, one made with the Levallois technique, and a tool-kit dominated by side-scrapers (Fig. 1.3). No tanged pieces or Later Stone Age tools appear in this assemblage.

To date, this site seems to provide the only early MSA lithic industry produced with both the Nubian and the Levallois techniques (cf. Van Peer 1991).

The presence of Nubian Type 1 cores was identified in the Libyan Sahara in culturally later contexts (Van Peer 2001). It appeared both in the Tadrart Acacus mountain range, at the Uan Tabu rock shelter (Garcea 2001), and in the Messak Settafet plateau, at Imrawen 2B. Uan Tabu and Imrawen 2B seemed to be contemporaneous, but were distinguished on techno-typological bases. While Uan Tabu was a typical Saharan Aterian site, Imrawen 2B did not exhibit the common Aterian characteristics (Van Peer 2001).

Nubian cores were only found in the lower part of the deposit at Uan Tabu. In addition to cores, there were also Nubian Type 1 points in the Tadrart Acacus (Garcea 2001). They were more common in the lower part of the Aterian deposit at Uan Tabu and a specimen appeared in an open-air site on the first terrace of the Wadi Teshuinat (Cremaschi and di Lernia 1998: Fig. 32.2).

An affiliation of the Aterian with the Nubian Complex had been suggested earlier (Van Peer 1998) and the existence of the Nubian technology in the Libyan Sahara was taken to confirm that the Aterian directly derived from the Nubian Complex (Van Peer 2001). It was suggested that "Nubian" groups dispersed in the Sahara during the last interglacial and adapted their material culture to the local environments by developing the Aterian techno-complex. It was also indicated that this adaptation process took place in the South-Eastern Sahara during the late OIS 5, as the Aterian assemblages at Bir Sahara and Bir Tarfawi show (Wendorf *et al.* 1987, 1993; Van Peer 1998).

This interpretation fits well in the picture of the Libyan Sahara. Nubian Type 1 cores and the majority of Nubian Type 1 points were recorded in the lower part of the deposit (Layers 23 and 24) at Uan Tabu, which must be earlier than the upper layer (Layer 22) dated by OSL to 61000±10000 years BP (Martini *et al.* 1998).

It is important to note that the Nubian technology was present in the Sahara, but it never reached the proportions of the Nile Valley. Therefore, it must have been known in the area, but it was only used occasionally.

The situation of the Libyan coast is different from that of the Libyan Sahara. The Nubian point reduction technology is not attested to at the Aterian sites in the Jebel Gharbi. It only appears in the early MSA assemblage with a generalised lithic industry.

LEVALLOIS TECHNOLOGY

Levallois technology is present in both the Jado and the Gharian areas. Levallois cores and flakes can be found in the early MSA assemblage (SJ-00-60) as well as at two Aterian sites in the Jado area (SJ-98-27A and SJ-00-58) and at two other Aterian sites in the Gharian area (SG-99-46 and SG-00-61) (Table 1).

Table 1. Presence of Levallois debitage.

Levallois	Cores	Flakes
Jado area		
SJ-99-27A	3	4
SJ-00-58	3	4
SJ-00-60	0	1
SJ-00-57	0	0
SJ-00-58A	0	0
Gharian area		
SG-00-61	5	2
SG-99-46	2	3
SG-99-40	0	0
SG-99-41	0	0

This technology appears in both the early MSA site, together with the Nubian technology, and some, but not all, Aterian sites. Four out of eight Aterian assemblages do not include Levallois pieces. Therefore, there is reason to believe that the Levallois technique was only in use in the earlier Aterian and was later replaced by opposed and single platform striking.

The Levallois cores (Fig. 1.4) are the biggest in size and can be wider than longer (Table 2). They are not regularly made. Some have an irregular shape and the majority shows remains of cortex, usually on the ventral face, but occasionally also on the dorsal face.

Table 2. Means of Levallois debitage (in mm).

Levallois	Length	Width	Thickness
Cores	46.4	51.9	21.4
Flakes	51.0	35.7	10.4

As previously noted (Barich *et al.* in press b), Levallois flakes are longer than cores (Table 2). This further confirms the "reduction percentage", that typify the Aterian in North Africa (Van Peer 1991). The presence of large Levallois flakes accompanied with the absence of

Table 3. Aterian tool classes.

Tool classes	SJ-98-27A	SJ-00-57	SJ-00-58	SJ-00-58A	SG-99-40	SG-99-41	SG-99-46	SG-00-61
Levallois flakes	8.3	-	5.6	-	-	-	25.0	-
Points	-	-	-	14.3	-	8.3	-	-
Sidescrapers	16.7	9.6	29.6	42.8	-	8.3	8.3	11.6
Endscrapers	-	17.3	5.6	-	33.3	8.3	-	11.6
Perforators/Becs	-	13.5	7.4	-	33.3	8.3	8.3	27.9
Burins	4.2	1.9	-	-	-	-	-	2.3
Truncation	4.2	-	-	-	-	-	-	-
Notch/Denticulates	25.0	38.5	40.7	28.6	33.3	33.3	33.3	37.2
Tranchet	4.2	-	-	-	-	-	-	-
Tanged tools	37.5	13.5	7.4	14.3	-	8.3	16.7	7.0
Cont. Ret. Tools	-	5.8	3.7	-	-	16.7	-	2.3
Varia	-	-	-	-	-	8.3	8.3	-
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

large cores was also noted in the early MSA (Middle Palaeolithic) at Haua Fteah (Chazan 1995).

At Uan Tabu, in the Libyan Sahara, Levallois cores, flakes and even blades are present throughout the Aterian sequence (Garcea 2001).

TOOL TYPOLOGY

The majority of Levallois flakes were probably prepared to be used as such, and not as blanks of more formal types. Sidescrapers were more common at the sites where the Levallois technique was in use (SJ-98-27A, SJ-00-58, SG-99-46, SG-00-61). They were more numerous in the Jado area (Table 3).

Endscrapers (Fig. 2.1), perforators (Fig. 2.2) and becs (Fig. 2.3) were usually produced at the same sites and mostly appear at the sites where the Levallois technique was abandoned (SJ-00-57, SG-99-40, SG-99-41). One site (SG-00-61) shows a much higher frequency of perforators, suggesting that it may have been a specialised site.

Notches and denticulates (Fig. 2.4) are the most frequent tool class at all sites. Tanged tools (Figs. 2.5-6) are common at all sites. They do not seem to characterise a particular area or a particular phase of the Aterian. They are often broken, even though their distal part is usually thicker, and often carinated, probably to strengthen the part of the tool sticking out from the haft.

Site SJ-00-57, presently called Mahatta Frid due to the presence of a water pump, shows a tool-kit that is typologically similar, but technologically different from the others presented above. Tools are generally smaller and thicker and retouches are steep (Fig. 3). Tangs are little prominent and are elaborated with small notches. A bec is also present. At Mahatta Frid, the Levallois technique seems to be very distant from a cultural and probably also chronological point of view.

Apart from Site SG-99-40, which has a very small tool sample, and therefore may be statistically biased, Mahatta Frid includes the most significant frequency of endscrapers and perforators. Blade tools are not frequent, but elongated flakes are common. Therefore, there is reason to believe that Mahatta Frid represents a late Aterian production.

NORTHERN AND SOUTHERN ATERIANS

The geological sequences from the Jebel Gharbi both in the Jado and the Gharian areas indicate that the Aterian is separated from the preceding early MSA by a considerable lapse of time. Therefore, it should no longer be considered as a simple "pedunculated" evolution or acculturation of the early MSA (or Mousterian), as suggested in the past (Bordes 1975; Ferring 1975; Clark 1982; Tillet 1995).

Chronological, technological and typological differences appear in the Aterian assemblages in northern Libya and in the Sahara (Table 4). The absolute dating of the upper part of the Aterian sequence at Uan Tabu is earlier than the suggested chronology for the entire Aterian sequence in the Jebel Gharbi. Furthermore, the Aterian groups in the Sahara were adapted to live in arid climatic conditions, whereas those settled in the north benefitted from a more humid climate, which lasted for a longer period of time.

The Aterian in the Jebel Gharbi seems to be earlier than 30000 years BP and later than OIS 4 and may be associated with OIS 3, dated from 59000 BP (Barich *et al.* in press b). U/Th dating on calcareous crusts on top and below the silts with Aterian industries is in progress. Radiocarbon datings of the geological deposits indicate that the formations with Aterian artefacts are >30000 years BP. A similar chronology of the Aterian in North Africa has been recently confirmed in the Moroccan

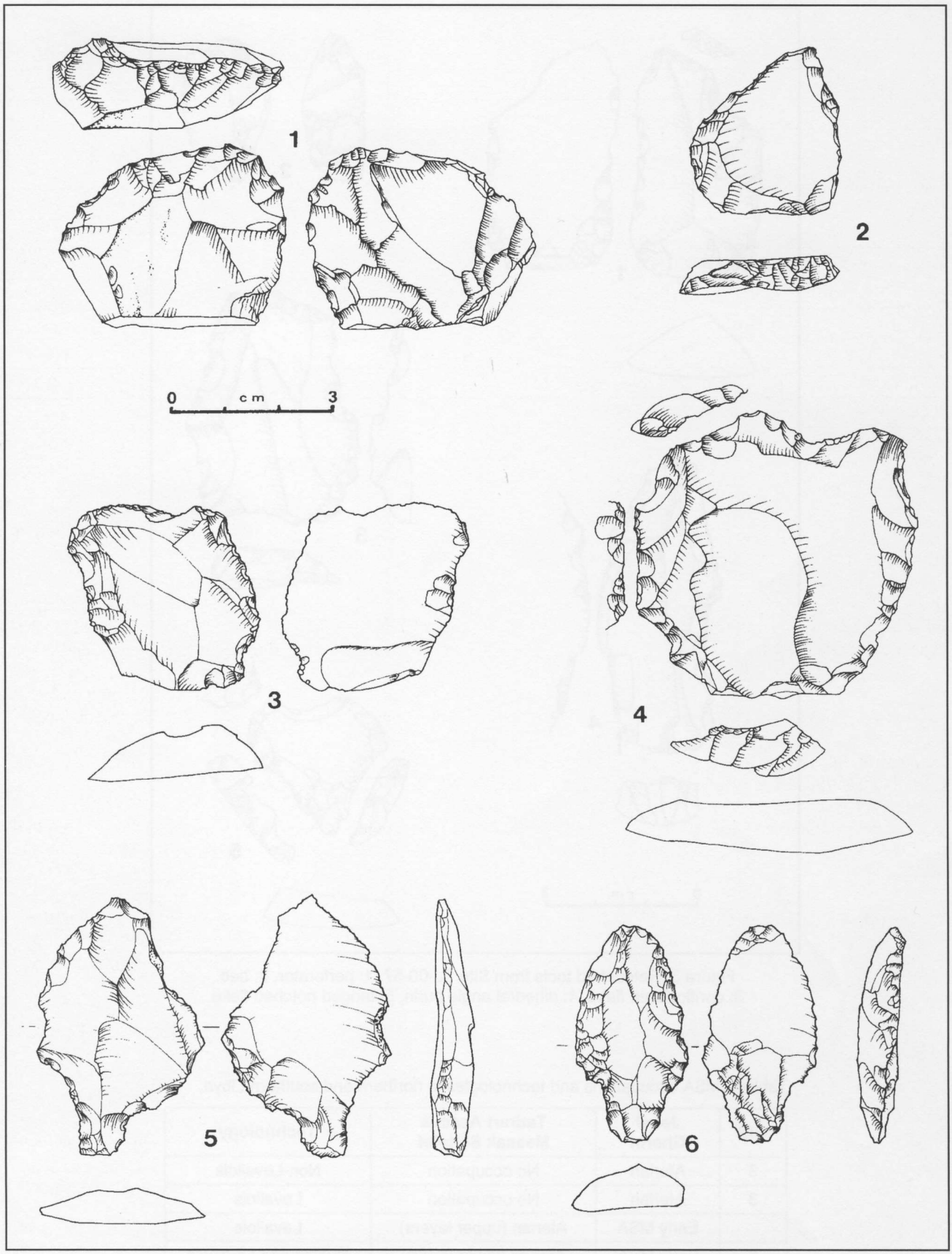

Figure 2. 1: simple endscraper on a retouched flake. 2: perforator. 3: multiple bec. 4: denticulated flake. 5: tanged retouched flake. 6: tanged point.

eastern Rif (Mikdad and Eiwanger 2000). At Ifri n'Ammar, the Aterian was dated to 41020-38570 cal BP (KIA 8822) and to 41030-39960 cal BP (KIA 8823) (Eiwanger, in litt.).

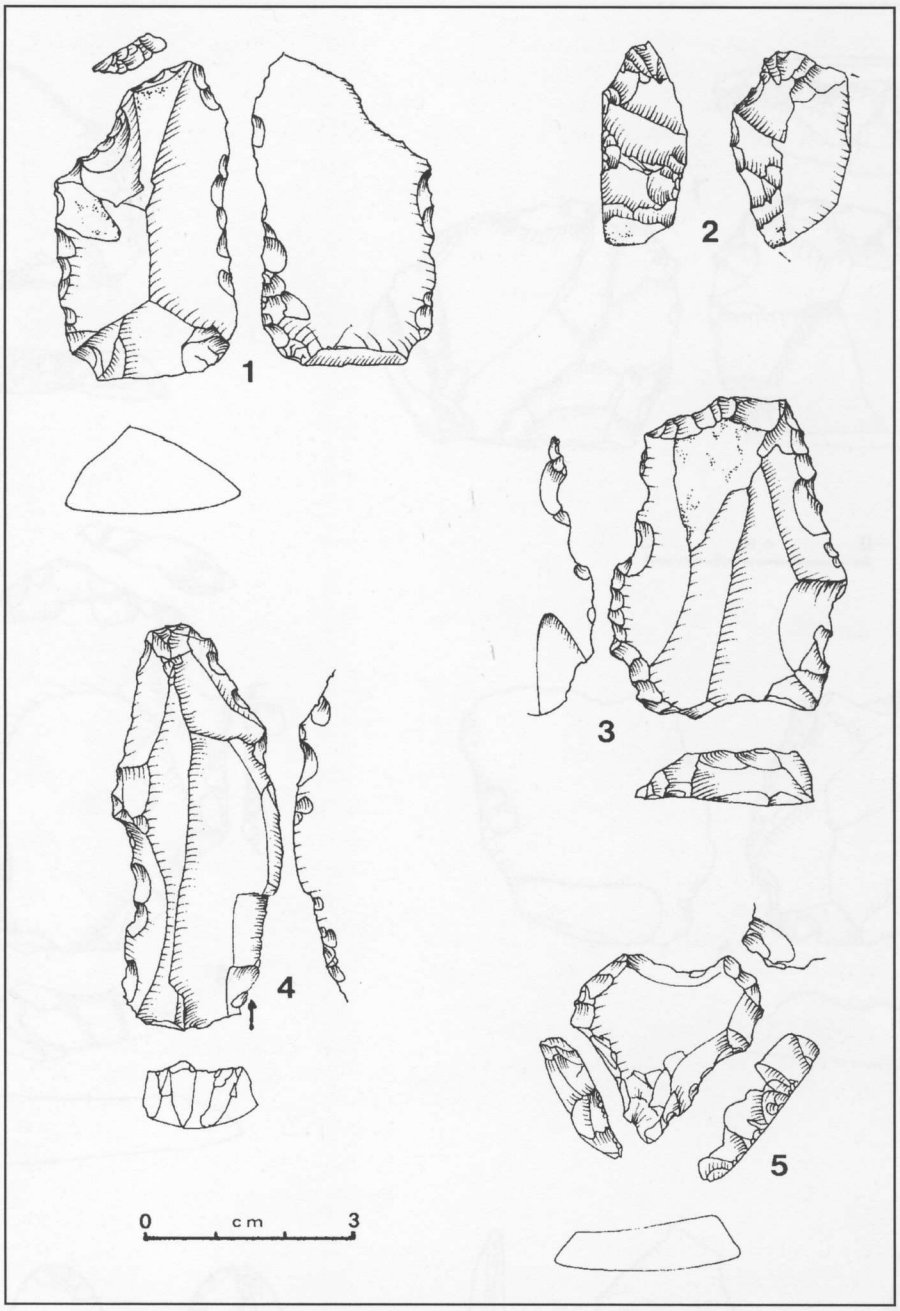

Figure 3. Retouched tools from Site SJ-00-57. 1: perforator. 2: bec. 3: denticulated flake. 4: dihedral angle burin. 5: tanged notched flake.

Table 4. MSA occupations and technologies in northern and southern Libya.

OIS	Jebel Gharbi	Tadrart Acacus Messak Settafet	Technology
3	Aterian	No occupation	Non-Levallois
3	Aterian	No occupation	Levallois
	Early MSA	Aterian (upper layers)	Levallois
5	Early MSA	Aterian (lower layers)	Nubian and Levallois
6	?	Early MSA	Non-Levallois

At Ras el Wadi, a layer immediately above the Aterian horizon included a blade technology, with no microliths, giving evidence of a true LSA (Upper Palaeolithic) unit. Further evidence for LSA occupations came from the Shakshuk area.

Uan Tabu is the only fully Aterian site dated in the Central Sahara. The upper Layer 22 provided an OSL date of 61000±10000 years BP (Martini *et al.* 1998). The technology of the entire Aterian sequence seems to be more conservative in the Libyan Sahara. At Uan Tabu, the Nubian technique was in use particularly in the earlier Aterian occupation and the Levallois technique was employed during the entire sequence. In the Jebel Gharbi, The Nubian technique is not attested to at any Aterian site and the Levallois disappears from the seemingly more recent Aterian sites.

Typologically, the production and use of sidescrapers seem to be associated with the Levallois debitage, both in the Sahara and in the north. On the contrary, endscrapers and perforators appear at sites where the Levallois technique and sidescrapers lose their importance. Furthermore, industries made on smaller blanks with steep retouch, like the assemblage from Mahatta Frid in the Jebel Gharbi, can be compared with later Late Pleistocene aggregates recorded in the Messak Settafet (Garcea 2001; Van Peer 2001).

To conclude, this paper aimed at pointing out the existence of different chronological, technological and typological Aterian horizons in Libya, which represent various cultural groups adapted to different environmental conditions. Even though some general techniques and tool-kits appear over a large territory, they are separated by tens of millennia. It is therefore likely that these peoples adopted isolated forms of social organisation, as suggested for sub-Saharan Africa (Yellen 1998; McBrearty and Brooks 2000). Such a system could explain the conservative duration of technical traditions from the early MSA to the late North African Aterian and could justify their spread, at a very slow pace, over such a vast territory.

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