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HUMMAL: A VERY LONG PALEOLITHIC SEQUENCE IN THE STEPPE OF CENTRAL SYRIA – CONSIDERATIONS ON LOWER PALEOLITHIC AND THE BEGINNING OF MIDDLE PALEOLITHIC

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Introduction

The region of El Kowm (fig. 1) is an exceptional place, a key locale for understanding the Paleolithic of the Middle East (Jagher & Le Tensorer 2011). The research carried out over nearly 30 years by the department of Prehistory of the University of Basel, in close partnership with scientists from the University of Damascus, has greatly improved our understanding and knowledge of the evolution of human cultures in their chronological context. Within this region, the site of Hummal, a prominent mound at an artesian spring, has yielded the most complete sequence known to date, from Lower through Upper Paleolithic. The site lies at 2 km N-NE of the village of El Kowm (fig. 2). Discovered by G & M. Buccellati in 1966, the well was also identified in the literature as Bir 'Onusi, after the name of the owner of the site.

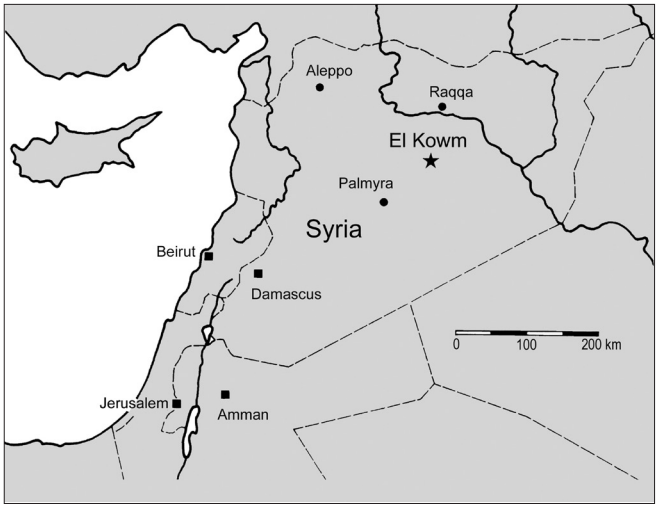

Figure 1 - General map of Syria.

In 1980, during a first field campaign devoted to geomorphology and Paleolithic research in the El Kowm region, the site was rather rapidly inspected and described (Besançon *et al.* 1981). In the lower part of the well, a new early Middle Paleolithic blade industry was recognized, and named the Hummalian (Copeland 1981; Hours 1982). At the invitation of the late F. Hours, who was directing the Paleolithic research group in the El Kowm area, the first author undertook a series of stratigraphic and sedimentological studies of the site in 1982, 1983 and 1985. Among other things, he was able to place the Hummalian stratigraphically above the Yabrudian, contrarily to what the first observations from a disturbed area had led the team to believe. During the winter of 1987, a massive collapse due to erosion of earth from the digging of the modern well and piled around its mouth filled up the lower part of the stratigraphy, which is still inaccessible nowadays. In 1997, with the support of Sultan Muhesen, then Director General of Antiquities and Museums of Syria, we decided to resume our study of Hummal. The first fieldwork consisted only in cleaning the existing profiles and collecting samples for further analyses. The excavations proper (figs. 3, 4) began in 1999 within the Syrian-Swiss Research Program on the Paleolithic in the El Kowm area under the joint direction of Sultan Muhesen and Jean-Marie Le Tensorer, with the collaboration of Hélène Le Tensorer, in charge of the lower part of the stratigraphy, Vera

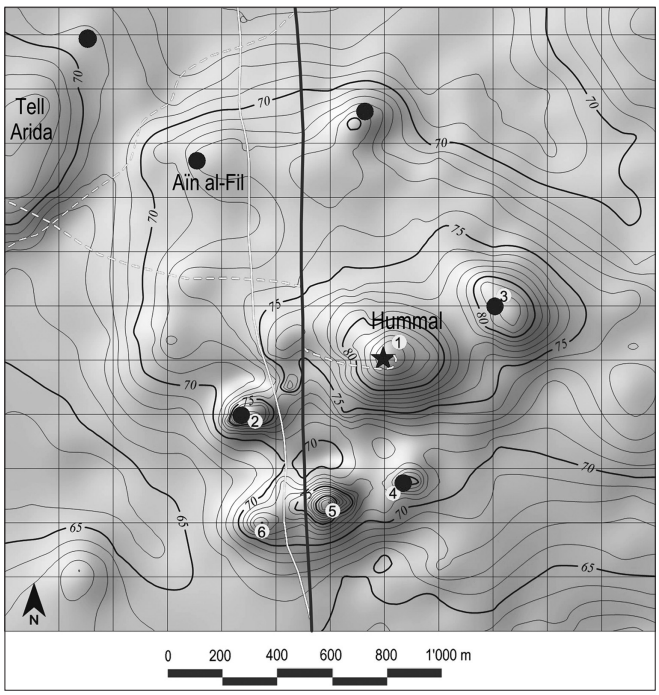

Figure 2 - Localisation of Hummal in the region of El Kowm: 1 Hummal, 2 Aïn Beni Ali, 3 Athman Hautman, 4 Bir Fransiin, 5 Tell Abu Saleh, 6 Tell Schnou, 7 Aïn Al Fil. (illustration R. Jagher).

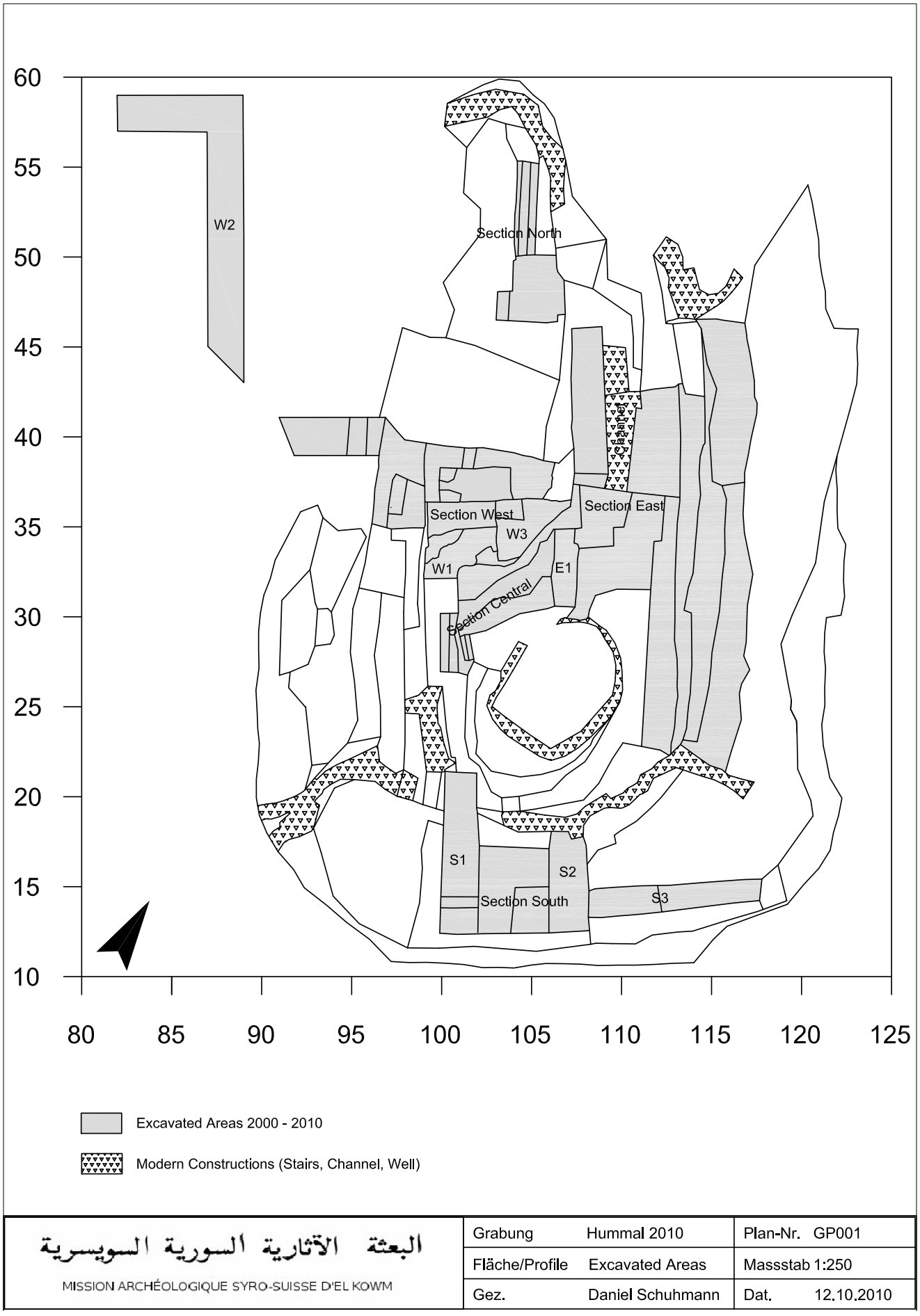

Figure 3 - General plan of the excavation (map D. Schuhmann).

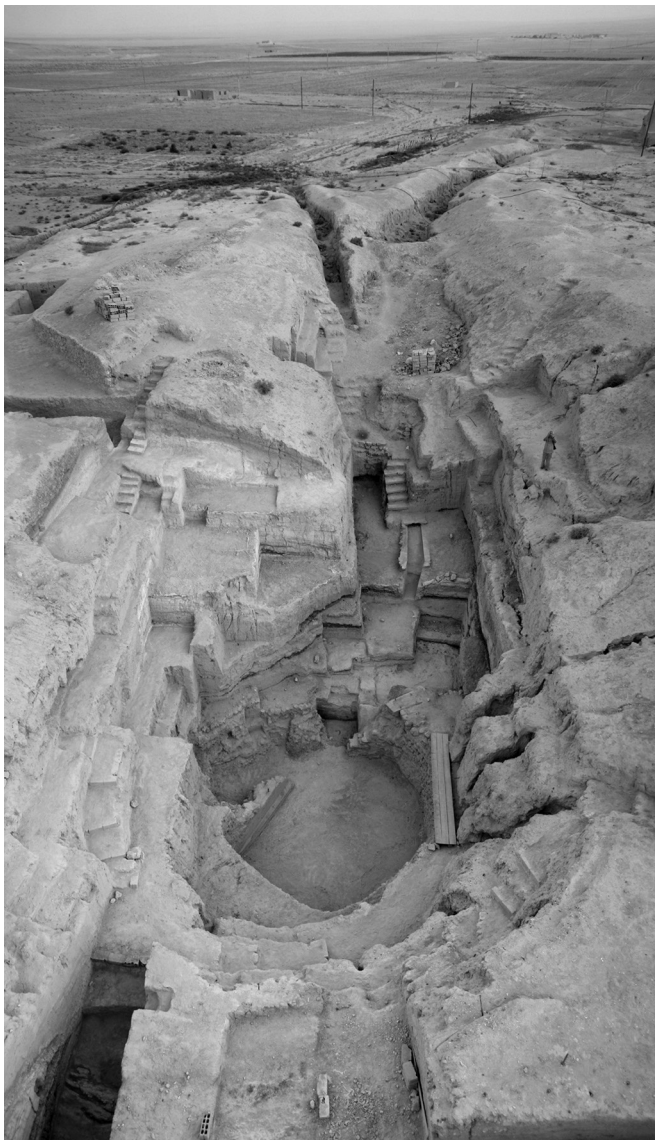

Figure 4 - General view of the site of Hummal looking north (photo A. Sanson).

von Falkenstein responsible for the middle part, and Dorota Wojtczak for the Hummalian sector. At this time it was deemed necessary to enlarge the excavation surface around the spring area in order to extend the excavations deeper.

Presentation of the site and general stratigraphy

The deposits in Hummal actually derive from two quite different, sedimentary processes (fig. 5). An in-situ consistent sedimentary series of lacustrine carbonates, clayey deposits and soil formation processes extends over 15 meters, preserving tens of archaeological levels ranging from Holocene to Lower Pleistocene, and providing evidence for hominid presence in the area over one million years at least around the spring-pond of Hummal. These levels have been integrated into large cultural complexes or units, identified by capital letters.

A central sink hole which contains detritic sand deposits accumulated along with disordered, non-stratified scree derived from massive deposits, colluvia and collapsed strata from the eroded margins of the spring well. We note the presence of at least, six detritic sequences containing a great number of Hummalian and Mousterian artifacts. The phases of erosion responsible for the massive deposits took place mainly during Middle Paleolithic times.

A simplified stratigraphy of in-situ units

Unit A. Layer 1: historical Holocene sediments beginning in Roman Times and extending to the present; layer 2: pre- and proto-historical sediments; layer 3: colluvial sediments from the beginning of the Holocene period, cutting Upper Paleolithic and Late Middle Paleolithic deposits in the Western and Northern sections.

Unit B. Layer 4: Late Upper Pleistocene sediments from an Early Upper Paleolithic (Levantine Aurignacian or Ahmarian) in the Southern section.

Unit C. Layers 5a to 5h: Upper Pleistocene sediments from a Late Middle Paleolithic (The Mousterian sequence, which is roughly four meters thick, is described by Hauck (2011).

Unit D. Layers 6 and 7: Late Middle Pleistocene sediments from an Early Middle Paleolithic (Hummalian) sequence discussed by Wojtczak (2011).

Unit E. Layers 8 to 12: Upper Middle Pleistocene sediments with the Yabrudian sequence.

Unit F. Layers 13 and 14: Lower Middle Pleistocene sediments encompassing a Lower Core and Flake Paleolithic culture with extremely scarce handaxes. We provisionally termed this industry Tayacian or Acheuleo-Tayacian, owing to analogies with the non-standardized Tabun G flake industry identified by Dorothy Garrod.

Unit G. Layers 15 to 23: Lower Pleistocene sediments comprising an Archaic Paleolithic with pebble-tools relating to an Oldowan-like Core and Flake facies. To date, excavations have not reached the bedrock.

Stratigraphy in the sector of the sink hole or doline

Series 1 & 2: αh lower sands, which include both sterile deposits (series 1) and deposits containing a large number of typical Hummalian artifacts (series 2). The deposits are obliquely stratified and result from the collapse of sand accumulations of which we can find substantial traces at the base of black clay layers 7 and 10. We are thus dealing with two successive sandy deposits. The sands below layer 10, belonging to the Yabrudian sequence, are still poorly known, while those from the Hummalian layer 7 have been found in the eastern sector where they appear in a small, typical dune-like formation.

Series 3: scree of blocks, 15 to 30 cm large, of limestone or water-polished and eroded travertine fragments divides the Hummalian sediments.

Series 4: accumulation of rust-coloured conglomerate, with small pebbles and limestone gravels, containing a combination

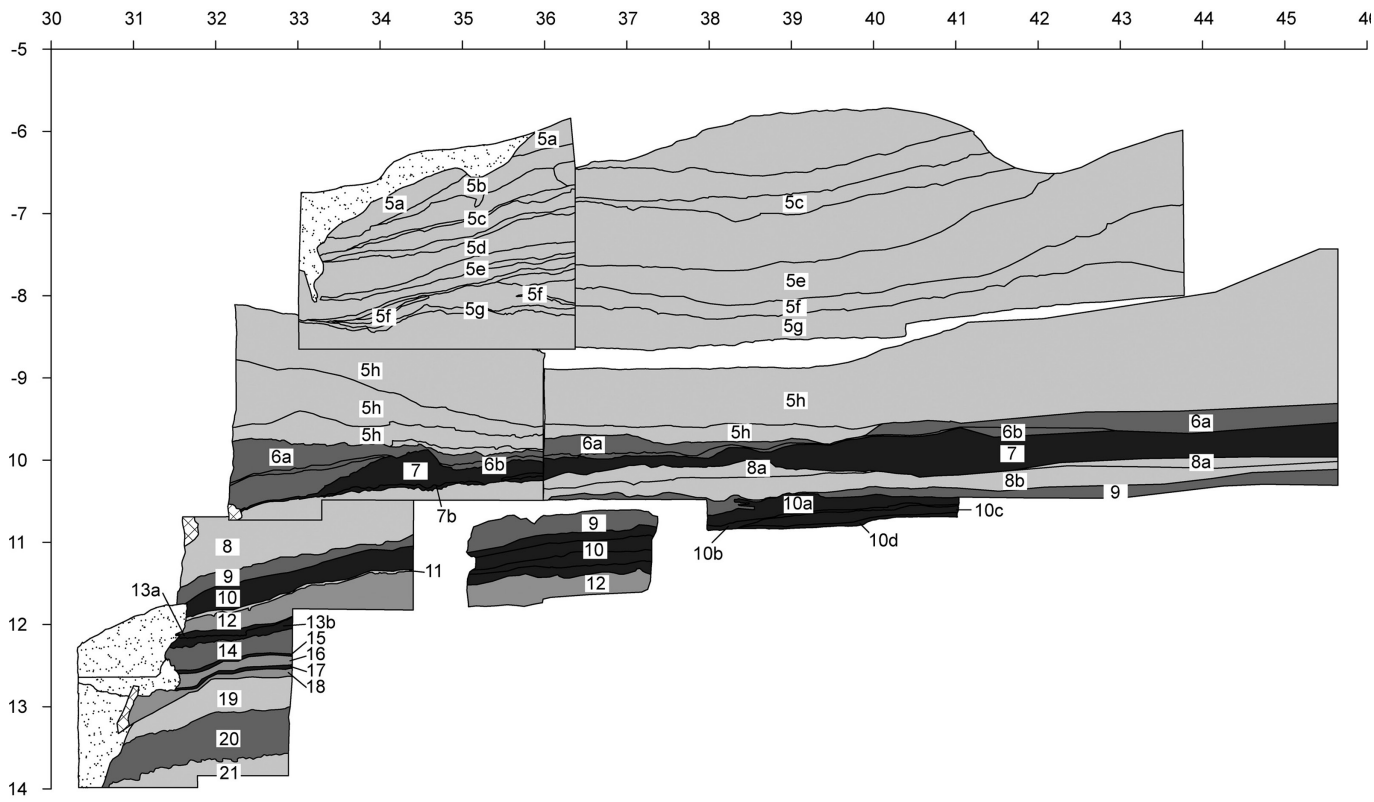

Figure 5 - General stratigraphy of Hummal (illustration D. Schuhmann).

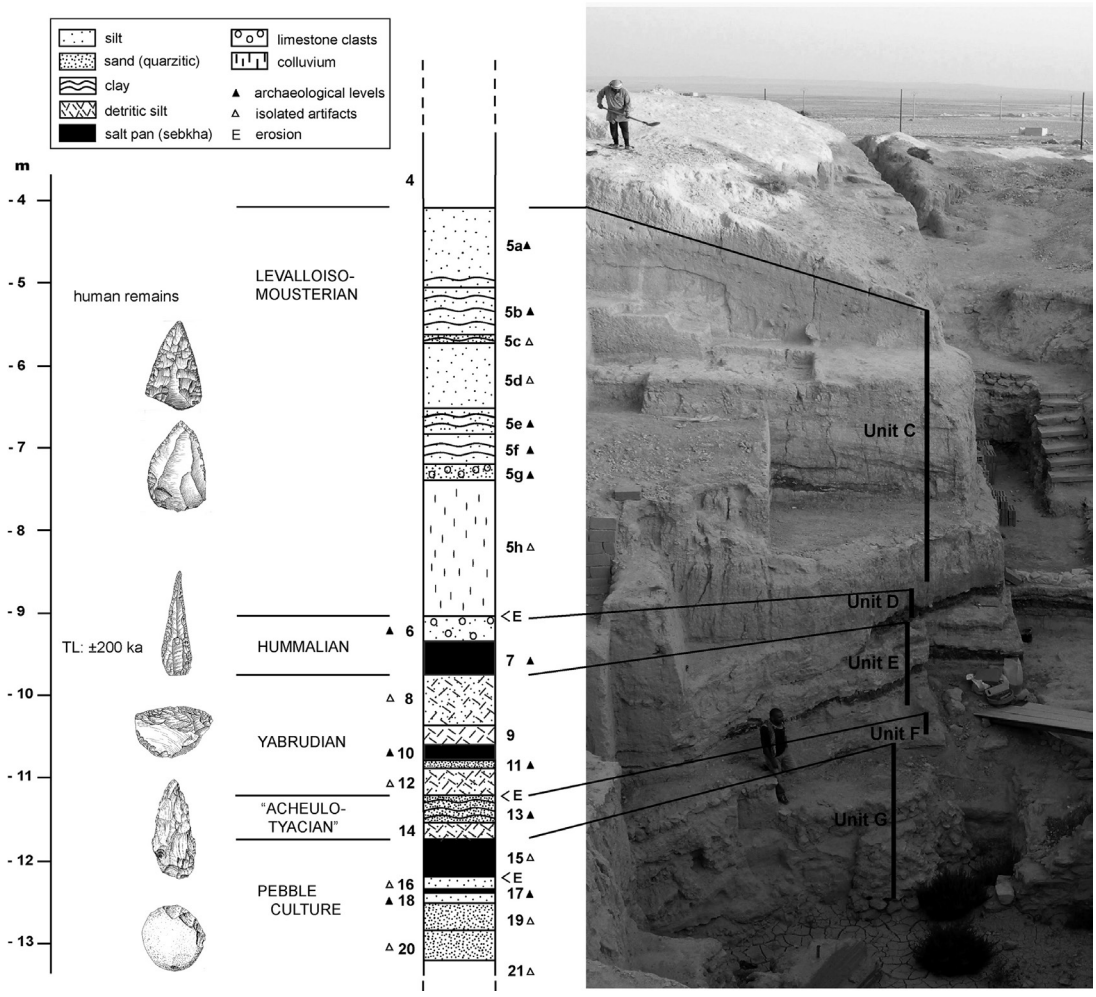

Figure 6 - Archaeological record (photo J.-M. Le Tensorer, drawing modified after Th. Hauck).

of Hummalian and Yabrudian industries which shows that erosion affected older levels still preserved at that time.

Series 5: massive collapse of big travertine blocks as large as one metre. Hummalian elements of the latest phase of layer 6 are found within this deposit. It corresponds to the breakdown of layer 6bT.

Series 6: αm upper or Mousterian sands; sub-horizontally stratified deposits yielding an industry with Levallois débitage. They might come from several sandy deposits of which we find traces at the bottom of layer 5g in particular.

These sandy detritic series gully and truncate all the layers lying below the Hummalian level 6. We may surmise that, at the beginning of the Mousterian period, a major collapse of the central doline took place, causing sand and scree to fill in the newly-formed depression.

Observations on the genesis of the deposits

In Hummal, the geological formations result from a significant accumulation of limnic, aeolian and travertine deposits around the vents of the artesian well where the sediments were trapped. The water hole, like others around it, must have been an important ecological feature in the steppe environment, attracting animals and, following on their trail, humans. Hominids visited and settled in this area over long periods, probably more than one million years, leaving evidence of their successive occupations in an extraordinary long archaeological record (fig. 6).

The site formation processes at Hummal stem from its geological structure: an artesian spring with numerous small pools of emergent groundwater (Ismail-Meyer 2009). A ring of vegetation grew on the banks of the pond and a spring mound developed by the accumulation of sediments and carbonate precipitates. Most of the deposits consist of micritic loam, directly precipitated in water. Sedimentological and micromorphological analyses indicate that the sediments accumulated both during phases of high water levels and also during dry periods. As the water level decreased, the margins of the pond were subject to erosion. Less plant cover meant more sand blown away in a region where wind is a constant erosional agent. The scanty vegetation left around the spring and the depression of the dried pond could still act as a trap for sediments, however. Large deposits of aeolian sediments are present, but, due to development of the sinkhole during the Upper Pleistocene, there were displaced, so that many cubic meters of well-sorted sand accumulated in the centre of the doline.

Some parts of the deposits show also strong post-depositional alteration. Early diagenesis is affected by processes such as dissolution and precipitation of minerals. Due to carbonic processes, pH values above 9 led to the dissolution of silica and, consequently to the formation of new quartz minerals in some parts of the stratigraphy. On a macroscopic scale flint artifacts from certain parts of the sequence at Hummal are covered with a highly glossy coating, a result of SiO2 precipitation (Masson 1982). Artifacts with this coating show an extremely shiny and smooth surfaces. The same applies to grains of quartz sand whenever they are patina-coated. This phenomenon is mainly found in layers rich in quartz sands, in a humid environment with substantial sediment cover.

Holocene (Unit A)

During the Holocene (Layers 1 to 3), the spring was not really active. Due to deflation, fine aeolian quartzitic silts and gypsum sands covered the former Pleistocene topography of the site. These sediments show strong bioturbation, including root traces or dessication cracks coated of iron and manganese oxides. Lightly developed soils occur in layer 2. In stratigraphic terms, several levels are easily identified, but their archaeological content is very poor, limited to a few ceramic shards pointing to a period from Bronze Age to Roman times. A few Neolithic or even Epipaleolithic stone artifacts were also found, but not in stratigraphic context.

Late Upper Pleistocene (Unit B)

An erosive discontinuity clearly divides the Holocene and Pleistocene levels. An Upper Paleolithic occupation (Levantine Aurignacian or Ahmarian?) is embedded in a colluvial formation (layer 4) which truncates the Mousterian levels.

Upper Pleistocene (Unit C)

The Mousterian complex represents one of the richest sets of archaeological occupations in Hummal (Hauck 2011). It is found at least in 8 successive sediment complexes (5a to 5h), comprising 39 archaeological levels forming a sequence approximately 4 m deep. In the Mousterian sequence, limnic carbonatic silts (deposited below water) alternate with detritic carbonates, sand or pedo-sediments representing dry periods. The lithic and faunal remains are exceptionally well preserved except for post-depositional weathering on the margins of the spring area.

Late Middle Pleistocene (Unit D)

The Hummalian sequence is embedded in the loamy complex of the layers 6a-6c and the clayey layer 7. Due to erosional processes, the thickness of these levels is extremely variable (from about 0.40 to 1.3 m). In the middle of Unit D, layer 6b contains a remarkably large quantity of flint artifacts (Wojtczak 2011). Nowhere thicker than 14 cm, this level eroded the underlying layer 6c and, at some places, reached the black clayey deposit 7. These blackish brownish or greenish laminated clay layers presumably relate to an environmental change to marshy conditions (Le Tensorer *et al.* 2007; Ismail-Meyer 2009). Rich in organic components, they contain a few lithic artifacts, bones and carnivore coprolites.

Upper Middle Pleistocene (Unit E)

The Yabrudian sequence occurs within in a deposit roughly 1.50 m thick. It comprises 5 layers which ultimately divide into different archaeological levels and correspond to several climatic cycles with evidence of successive alternation of arid and desertic phases with humid and cooler periods (Meyer 2000; Le Tensorer 2005):

Layer 8 is a thick deposit (up to 80 cm) of light-coloured, detritic, carbonate silts preserving, in the upper part, a Yabrudian level (8a) roughly 10 cm thick. In this layer, evidences of the first signs of a slight pedogenesis appear. This level is poor enough as regards lithic material but rich in faunal remains, especially camelids and equids. The remaining sediments in this Layer 8 are sterile and were deposited during dry, warm and stable climatic conditions in a confined swamp environment. Humans seem to have left the area during this long arid period.

Layer 9, 30 cm thick and similar to the previous one, relates to four lacustrine phases of carbonate formation in a cool and humid environment, interrupted by phases of ground-water level decrease resulting in several episodes of pedogenesis (Meyer 2000). This layer provides evidence of successive alternations of arid and humid climatic conditions. The layer, subject to a severe climatic discontinuity, yielded a few Yabrudian artifacts, mainly at its base.

Layer 10, a black clay level similar to layer 7 was probably deposited during a period of confined swamp environment under intermittent sebkha-like conditions. It is finely stratified and shows alternating greenish or blackish bands containing charcoal fragments and organic fragments of plant remains accumulated during a humid period. The thickness of the layer is variable and fluctuates from 30 to a few centimetres in the Western section where it is deeply eroded by layer 9. Bones of equids and camelids are present in the upper third of the layer. The base of the black layer shows a clear discontinuity with the underlying stratum 11 into which it cuts. Layer 10 encompasses two Yabrudian levels at least.

Layer 11 consists of an orange sandy loam level, subdivided into an aeolian sand level (11aS), a level with detritic granules (11a) and at the base, a light clay deposit (11b). It relates to a typical desertification cycle, starting with an evaporite clay deposit, followed by an erosive event and ending in a drastic arid phase with no plant cover remaining. Level 11b corresponds to a humid phase, comprising large bones and some typical Yabrudian side-scrapers. The whole sequence underwent a light soil development.

Layer 12 is a yellow plastic clay level, silty in places, travertinized in others. It is 20 to 30 cm thick, almost sterile, except at the base where a thin level yielded a few artifacts, not very characteristic but possibly Yabrudian. It relates to at least two cycles of lacustrine deposits in a humid and cool environment.

Middle Pleistocene ? (Unit F)

The Acheuleo-Tayacian Industry occurs only in Layer 13 which comprises 3 detritic levels. The upper one, 13a, is a thin, bleached layer of small granules. Its thickness varies from 1 to 6 cm. The middle one, 13b, is a thin, sterile, dislocated, pale clayey loam eroding the underlying layer 13c. This last level, about 15 to 40 cm thick, is made of gravel and small pebbles embedded in a loam with blackish traces of manganese and iron oxides. The lower level is rich in flint artifacts, which are extensively abraded.

Layer 14 About 10 – 30 cm thick, consists of fine grained carbonate silts with a minor detritic component. So far no archaeological material has been discovered in this layer.

Lower Pleistocene (Unit G)

Layer 15 consists of blackish clay and is 10 to 15 cm thick. Only few stone artefacts were found in this layer, the faunal remains are more numerous but heavily crushed and broken.

The underlying Layer 16, about 30 cm thick, is a hard, carbonated silt. The density of finds is not very high and a proper archaeological level is not recognizable.

Layer 17 is about 10 to 15 cm thick and again consists of black clay. It is very similar to Layer 15 but abounds in finds. Numerous bones are preserved but crushed and fragmented. This layer is very well-provided with microfaunal remains.

Layer 18 includes the richest levels of the Early Palaeolithic sequence. It consists of a thick (25 cm) sandy carbonated silt. Two archaeological levels are present; one is situated on the top of the layer, the other is embedded in the middle of the layer. Archaeological finds are very abundant, markedly in the upper level, including parts of animal skeletons that are sometimes anatomically connected.

The deepest archaeological level lies in Layer 19 under 1m of sterile and compact carbonated loam. This level was discovered in 2008. Several lithic artefacts and well-preserved bones, especially of a new species of a small camelid, were unearthed.

Underneath, Layers 20 and 23 are compact sandy and fine detritic series with very rare flints.

Observations on the archaeological assemblages

Upper Paleolithic (Unit B)

In the Southern section, the Upper Paleolithic assemblage represents only 319 artifacts (fig. 7). The knapping strategy focuses mainly on the production of blades and bladelets; flakes amount to 13% of the artifacts while very small flakes and debris make up a third of the débitage. Retouched pieces (fig. 9) make up 10% of the assemblage. They are mostly end-scrapers (almost half of the tools with retouch), a few dihedral or on-break burins (about 20% of the retouched pieces); the remaining tools include retouched blades (among which one of them is a typical Aurignac blade), notched pieces, and denticulates.

Late Middle Paleolithic: Mousterian sequence (Unit C)

Technological observations support a Mousterian sequence divided into three parts: the upper, middle and lower industries. This partition reflects the association of several assemblages into major techno-typological traditions (Hauck 2011). The outstanding discovery in this Mousterian period consists of the remains of a giant camel which coexisted with Camelus dromedarius. The animal measured over 3 m at shoulder-height. Roughly speaking, it was 1.5 to 1.75 times bigger than the mo-

Blades	71	22%
Bladelets	52	16%
Burin spalls	8	3%
Flakes	43	13%
Debris	112	35%
Retouched tools	33	10%
Total	**319**	**100%**

Figure 7 - Layer 4, Upper Paleolithic, inventory of artifacts.

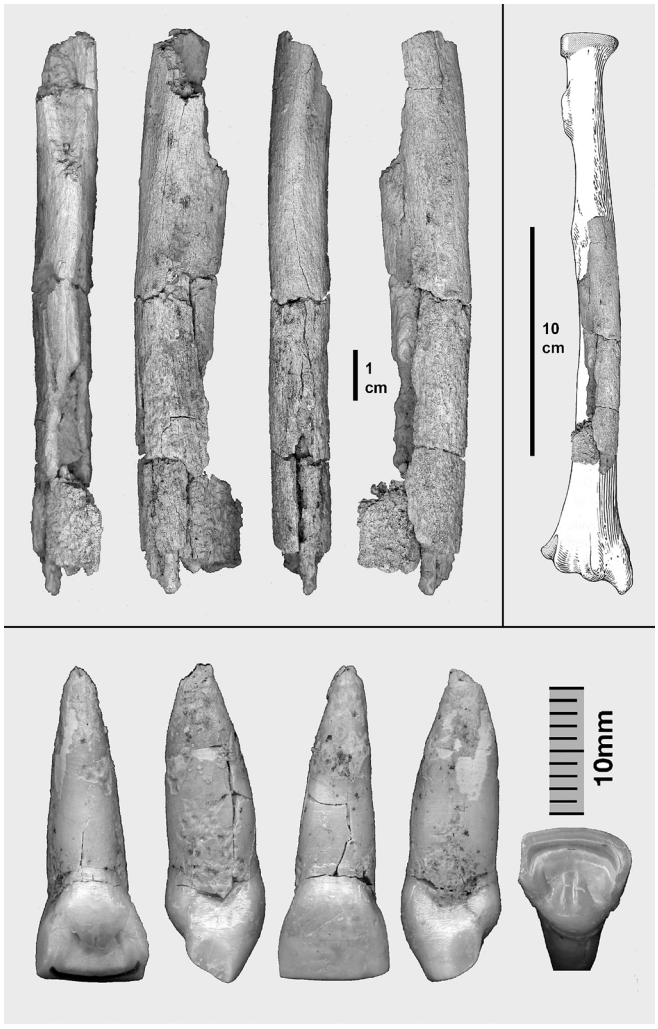

Figure 8 - Human remains from the Mousterian levels, mesial fragment of a radius (top) and an medial upper incisor (bottom), photo P. Schmid.

dern camel. We tentatively called it "*Camelus morelli*" after our late paleontologist team-member, Philippe Morel.

In the same layer, in addition to the large assemblages of flint artifacts, we unearthed two fragmentary human bones. A medial left upper incisor, designated W1374 (fig. 8), was found in level 5a4. The combination of traits favors a determination of the tooth as belonging to the Neandertal group (Schmid & Le Tensorer 2009). However, the root length (15.3 mm) is below the range observed in Neandertals. Other measurements, such as the labio-lingual diameter, seem to cluster the tooth with the latter but compared to the specimens from Qafzeh, we cannot exclude a certain resemblance to the oldest anatomically modern man. At the moment, the scanty evidence does not allow a clear determination of the species, Neandertal or Anatomically Modern Human. The second element is a fragmentary but robust rather straight radial diaphysis discovered in 2003. The total length of the specimen, designated ZZ33C, is 109 mm. Despite variation in radial diaphyseal proportions in the context of the available human remains from the later Pleistocene of western Eurasia, the Hummal radius has proportions that align it predominantly, by no means exclusively, with early modern human remains.

We have very few dates at our disposal so far (more dating is in progress) so we cannot present a complete chronological framework for the Mousterian sequence yet. Preliminary TL-dates (Richter *et al.* 2011) for sediments of layer 5g in the lower part gave an age around 100 ka. Even though better chronological control is clearly needed, the deep Mousterian sequence at Humml is of great importance, making Hummal a key site for reconstructing human presence in and exploitation of arid environments during Middle Paleolithic times.

Early Middle Paleolithic: Hummalian sequence (Unit D)

When we mention "Early Middle Paleolithic" in this paper we refer to the assemblages found between the Acheulian and Mousterian complexes, i.e. Yabrudian and Hummalian industries. The former is part of a group that also includes the Acheuleo-Yabrudian and Amudian industries (Barkai & Gopher 2011), which Jelinek (1990) grouped into the so-called Mugharan tradition. Although Yabrudian assemblages may still include a small number of bifaces, in our view they are nevertheless to be completely separated from the Acheulian. They reflect a fundamental shift toward systematic production of flakes as blanks for retouched tools, something uncharacteristic of the preceding Acheulian (Muhesen & Jagher 2011; Jagher 2011).

The second phase of the Early Middle Paleolithic at Hummal is characterized by another major technological change: the production of elongated blanks using a distinctive and specialized core reduction method. The Hummalian industry (fig. 10) is subdivided into stratified geological layers which are intercalated clearly between the Yabrudian and Mousterian sequences (Le Tensorer 2004). In the heart of the doline, the massive sand deposit includes a large number of Hummalian artifacts. Archaeologically speaking, these artifacts are not in situ but correspond to a homogeneous assemblage, while stratigraphic observations show that these Hummalian sands are in place, geologically speaking.

A thorough and detailed study of 10 000 lithic artifacts, including round 7000 items found in the stratified layers 6 and 7, was carried out by Dorota Wojtczak (2011). The technological studies demonstrate the existence of a special typical laminar system of débitage, very different from a Levallois knapping technique, and yet Levallois products occur in the same assemblages. Wojtczak argues that there are two concomitant reduction strategies. The dating the Hummalian gave an age around 200 ka (Richter *et al.* 2011). This makes it roughly contempora-

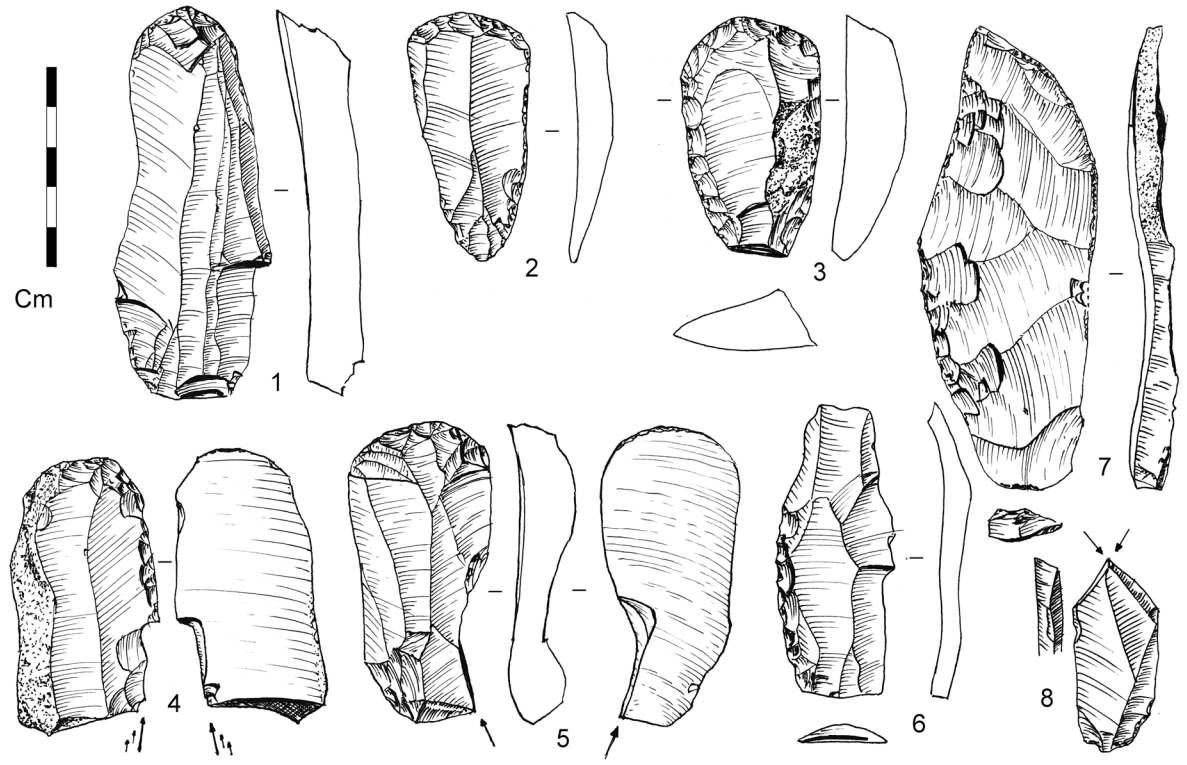

Figure 9 - Upper Paleolithic industry, selected artifacts. 1-3: end scrapers; 4-5: end scraper-burin; 6-7: retouched pieces; 8: dihedral burin (drawing J.-M. Le Tensorer).

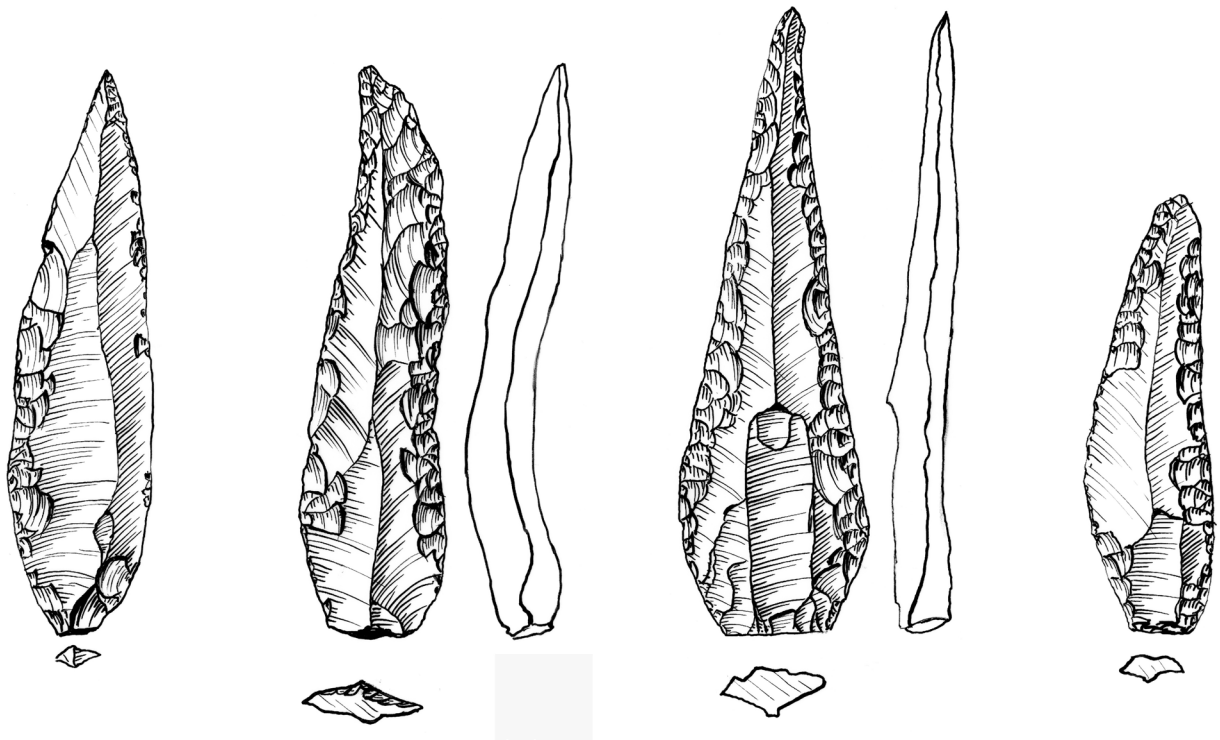

Figure 10 - Hummalian industry (drawing J.-M. Le Tensorer).

neous with so-called Tabun-D type Mousterian in other parts of the Near East.

The Yabrudian sequence (Unit E)

In Hummal, the Yabrudian sequence develops over a very long span of time, under changing climatic conditions which brought about the formation of diverse sedimentary facies. Most of the Yabrudian occupations correspond with humid, cool (even cold) times. During arid warm periods, humans seem to have abandoned the region. Layer 8 is poor enough as regards lithic material but rich in faunal remains. An entire lion mandible was discovered in this layer, which is especially rich in camelids and equids. Several typical Yabrudian side-scrapers and limaces were found in this layer Layer 10 contains two archaeological levels: an upper level of typical Yabrudian with characteristic heavily retouched side-scrapers and a lower one, in which we found in 2001 a distal fragment of biface, nicely retouched and Acheulian-like in the shaping, together with two biface trimming flakes. However, we cannot offer a final interpretation until a larger area has been excavated: as noted other Yabrudian assemblages do contain handaxes. However, at Hummal, this single Acheulian-like fragment from the base of layer 10 is the only bifacial artefact associated with typical Yabrudian scrapers.

As mentioned above, a rich Yabrudian industry was found among travertine blocks in a secondary position at the bottom of the well as it appeared in 1980. Lorraine Copeland and Francis Hours studied a first series comprising 703 artifacts, among which there were 245 retouched tools (Copeland & Hours 1983). Absolutely non-Levallois (IL 0.74) and non-laminar (Ilam 3.53), this assemblage is characterized by a great number of side-scrapers (IR 68.93). Single side-scrapers prevail (38.02%) but déjeté scrapers (10.2%) and transverse scrapers (10.6%) (fig. 11) are plentiful and quite characteristic of this culture. Generally, the side scrapers bear a Quina-like retouch. Completing this inventory were miscellaneous tools, some rare scraper forms, notches and denticulates and a few pointed flakes. Bifacially shaped pieces are also found in these levels (4%). They tend towards strong asymmetry, as in general only one single edge is finely retouched and used. These artifacts may be characterized as either genuine bifaces or large side scrapers with bifacial retouch.

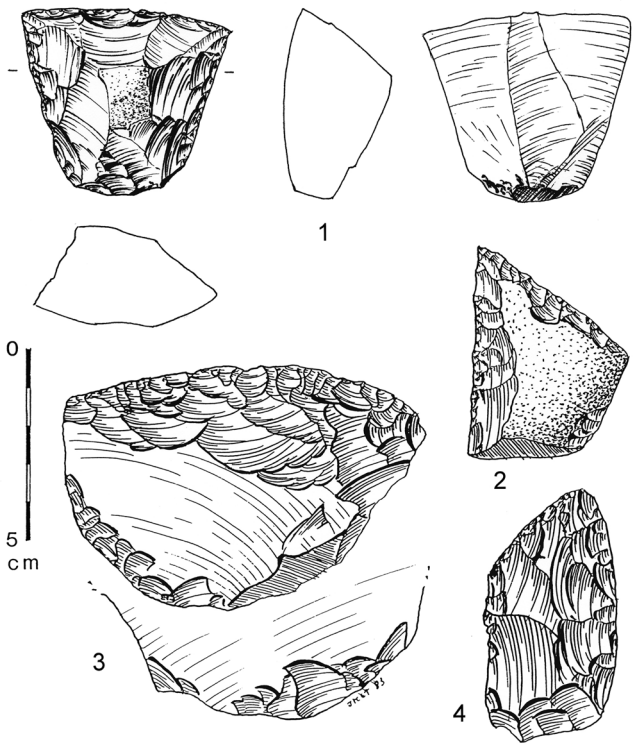

Figure 11 - Yabrudian industry, selected scrapers (drawing J.-M. Le Tensorer).

However, the validity of this series may be question as the artifacts were collected in levels, archaeologically speaking, not in situ; they might have been mixed with other industries. Since 1999 the five in situ Yabrudian layers produced too little lithic material to put forward a study of significant statistical value (Schuhmann 2011).

Nonetheless, we can safely state that, in Hummal, the Yabrudian is an industry characterized by a predominant production of very thick flakes, quite often transverse or déjetés, which were used as blanks for nearly exclusively scaled and Quina-retouched side scrapers. The artifacts are always deeply retouched and resharpened; sequential resharpening of the edges again and again on double side scrapers led to characteristic pointed limace forms (fig. 12).

The Yabrudian industry is quite in keeping with the Lower Quina culture as it is defined in Europe in term of core reduction and typical retouch (Bourguignon 1997; Al Qadi 2008). Over the past decades the question has been raised as to whether the Yabrudian, as a cultural chronological stage, should be placed within the Lower or within the Middle Paleolithic. A. Jelinek (1982, 1990) and others (Goren-Inbar 1995) consider it to belong to Lower Paleolithic. R. Barkai and A. Gopher, based on new findings from Qesem Cave, emphasize the originality of the Yabrudian and Amudian stages and suggest that we should distinguish this "cultural complex between Acheulian and Mousterian as an independent, long, creative and innovative cultural entity reflecting dynamic human behaviour and flexible local adaptations" (Barkai & Gopher 2011). Expressing another point of view, A. Ronen, as he reconsiders the sequence of Tabun, proposes to limit and redefine Jelinek's Mugharan Tradition concept. This notion applies "the proposed 'Mugharan Tradition' is only valid within Garrod's Yabrudian. Contrary to Jelinek's interpretation the terms 'Mugharan' and 'Yabrudian' are synonymous" (Ronen *et al.* 2011). What sustains the use of the term "transitional" for the Yabrudian culture? Is it a Late Lower Paleolithic or an Early Middle Paleolithic?

From our point of view, this amounts to a purely theoretical debate, as we know in Europe how difficult it is to substantiate a conventional distinction between Lower and Middle Paleolithic (Monnier 2006).

Nonetheless, we note the important changes in the Yabrudian lithic industry compared to that of the Acheulian:
- Use of a new core reduction strategy, similar to the European

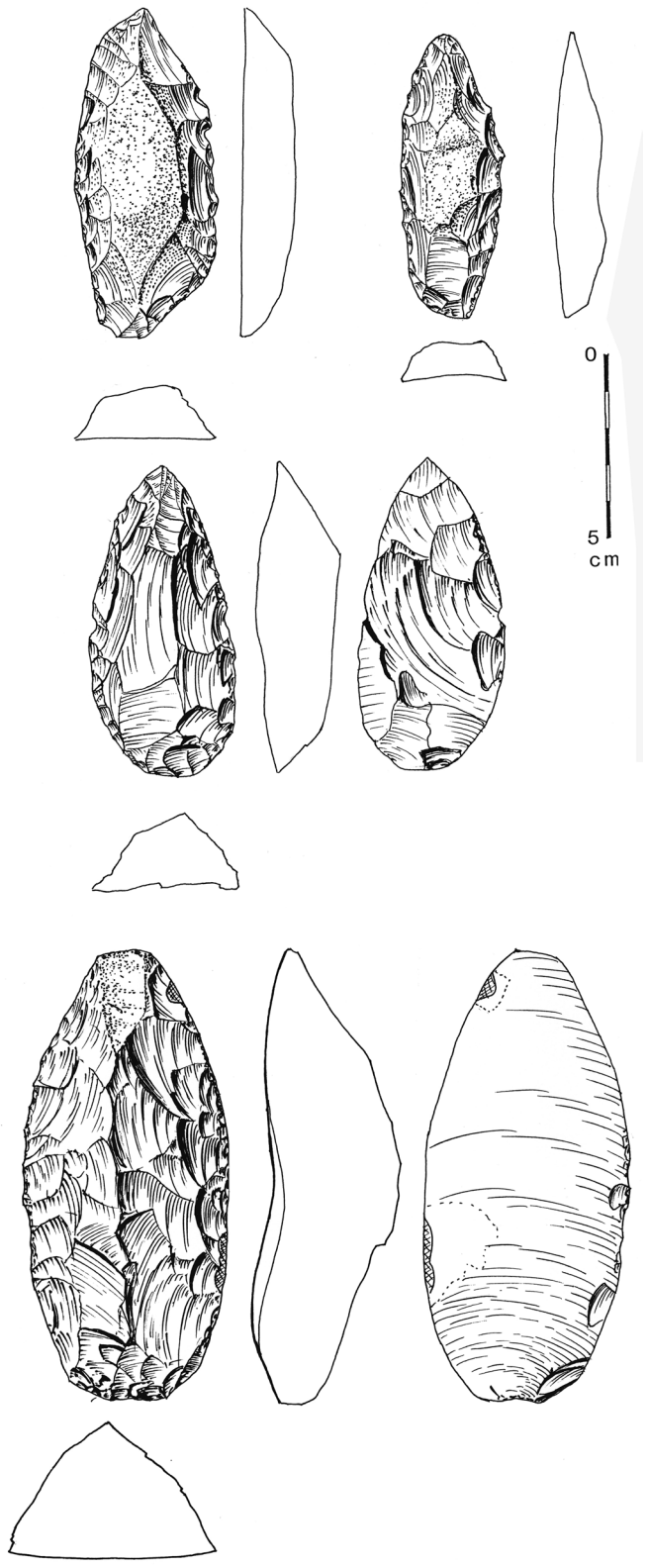

Figure 12 - Yabrudian industry, limaces (drawing J.-M. Le Tensorer).

Quina débitage, in order to produce very thick flakes, including numerous transversal and déjetés blanks.
- Systematic production of side scrapers that subsequently underwent intensive stepped-retouch and repreated resharpening.
- Presence of typical limaces as the result of repeated use and resharpening of scrapers.
- Very little true bifacial shapening. The rare "bifaces" are thick,

Pebble-tools	4	0.5%
Polyhedrons	1	0.1%
Cores	13	1.6%
Handaxes	2	0.2%
Cortical flakes	118	14.3%
Flakes	180	21.9%
Debris	131	15.9%
Small debris < 2 cm	324	39.4%
Retouched tools	50	6.1%
Total	**823**	100.0%

Figure 13 - Layer 13, inventory of artifacts.

asymmetric and perhaps used as bifacial scrapers. They also bear the typical Yabrudian (or Quina) stepped retouch.
- On the whole, the Yabrudian shows more diversity in technological procedures and products than the Acheulean.

When we sum up all the distinctive traits which characterize this culture, they clearly separate the Yabrudian and the Acheulian; we would also discard the term Acheuleo-Yabrudian for the Yabrudian in Hummal. In this site, these layers are unquestionably located between Lower Paleolithic context and a typical Middle Paleolithic with blade and Levallois débitages. Levallois technology is non-existent in the Yabrudian assemblages of Hummal. Thus we are led to think that Yabrudian is quite distinctive from Hummalian and Mousterian too. In a previous paper (Le Tensorer *et al.* 2001), we suggested placing the Yabrudian in an Early Middle Paleolithic I phase, the Hummalian in Early Middle Paleolithic II and the Levallois Mousterian in a Late Middle Paleolithic. The dating of the Yabrudian units of Hummal is in progress. The base of the overlying Hummalian complex is tentatively dated around 250 ka.

Lower Paleolithic: "Acheulo-Tayacian"? Sequence (Unit F)

Below the typical Yabrudian levels, a succession of layers yields a distinctive set of assemblages with rather simple débitage and opportunistic cores. The blanks are irregular, thick flakes. Out of 823 lithic artifacts (fig. 13), 78 show use-wear or slight retouch which most of the time forms notches or denticulates. There are also a few side scrapers and pebble-tools. In these levels we discovered two typical handaxes (fig. 14). They are thick and elongated, with traces of knapping using a hard hammerstone . Before the discovery of these bifaces, the industry had been named "Tayacian" with reference to the Tabun G (Garrod & Bate 1937), Umm Qatafa (Neuville 1951) and Yabrud (Solecki 1968) assemblages which show similar features with the industry of layer 13 at Hummal (Copeland 2003; Le Tensorer 2004). Clark Howell even named the Tabun G industry "Tabunian" because he wanted to emphasize the differences with Acheulian. It has to be underlined that, usually, the cultures labelled "Tayacian" in the different sites of the Levant are located at the base of the stratigraphic sequences preceding an "Upper Acheulian" stage. In other words, this suggests that these "Tayacian sequences" are by and large contemporaneous with a Middle Acheulian stage.

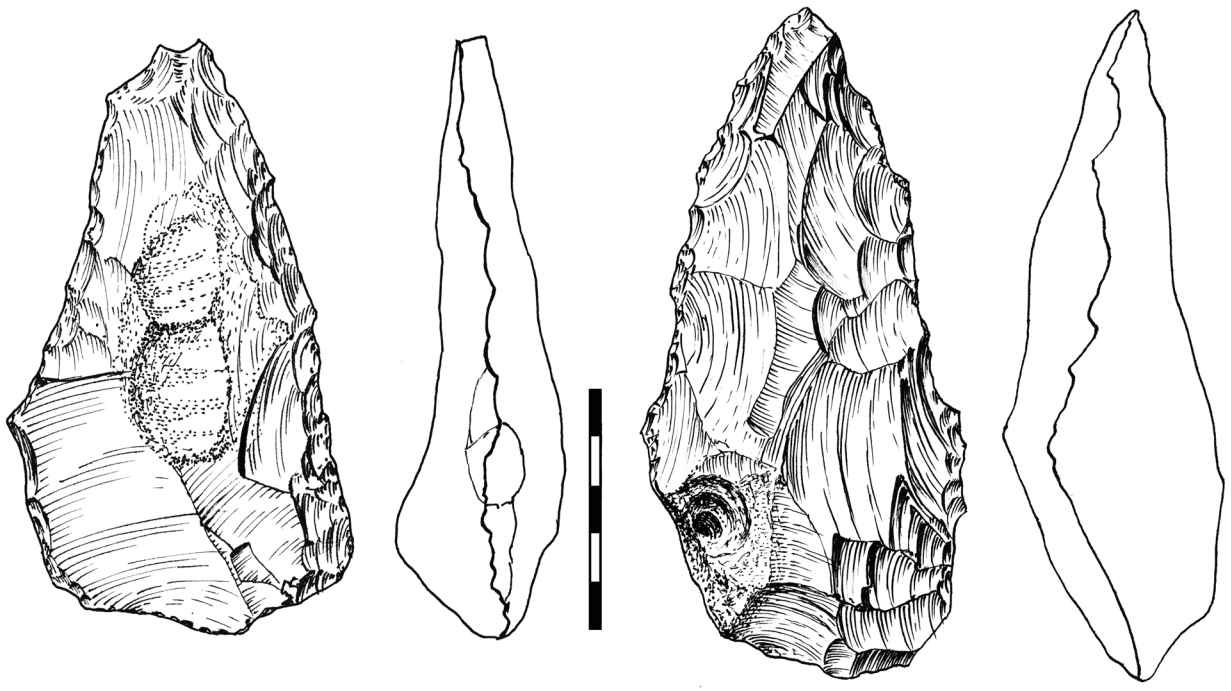

Figure 14 - Handaxes, layer 13 (drawing J.-M. Le Tensorer).

In view of the ambiguities that accumulated through the use of this term, the definition of Tayacian (Copeland 2003) is no longer useful for characterizing an archaeological culture. Nonetheless, the question remains: should we link these assemblages to a non-Acheulian "Core and Flake" culture, or, should they be considered a kind Acheulian assemblage without (or with very few) handaxes? As is typical in the Levant, Acheulian sites in the el Kowm region often yield extraordinary numbers of handaxes: The Middle Acheulean site of Al Meihra, and the Upper Acheulian assemblages of Nadaouiyeh, Juwal B or Qdeir 23 are perfect illustrations (Jagher 2011). In the archaeological layers within unit F at Hummal, bifaces are extremely rare. We could consider these levels with very few handaxes from Hummal as belonging to a different sort of "Acheulian" than those found in Nadaouiyeh or Al Meihra, perhaps a Middle Acheulian facies largely deprived of handaxes. Alternatively, the assemblage of layer 13 in Hummal might represent an independent culture from that of the biface-rich Acheulian. It should be emphasized that, so far in these levels we have never recovered biface trimming flakes, which suggests that the handaxes were not made or maintained in place.

Oldest Paleolithic: Oldowan-like Core and Flake industries (unit G)

The base of the sequence of Hummal, layers 15 to 21, contains Oldowan-like assemblages (Wegmüller 2008, 2011). The lithic industry can be characterized by non-modified flakes with occasional traces of use but seldom if ever intentional retouch. These flakes occur with pebble-tools: choppers, chopping-tools, polyhedrons, spheroids and other core-like artifacts (fig. 15). In a broad sense, this assemblage is typical of an archaic Paleolithic, the débitage of which corresponds to "Mode I Core and Flake Industries". From a techno-typological point of view, this industry fits quite well in the so-called Oldowan facies. It shows also remarkable similarities with the oldest assemblages at Ubeidiya, considered as an Ancient Acheulian (Bar-Yosef & Goren-Inbar 1993). This similarity again raises questions about cultural definitions of techno-typological assemblages and their relationship to human biological groups. We usually separate two complexes: Acheulian and "Core and Flake Industries", but are they really two different "tool traditions"? An Oldowan-like industry immediately becomes "Acheulian" as soon as a bifacial artifact or two is found (Muhesen & Jagher 2011).

As we have no absolute dating for the oldest levels at Hummal so far, we will remain cautious in assigning a chronological time span for these layers. From a chronologic point of view, the Oldowan-like levels of Hummal occur before the Matuyama-Brunhes paleomagnetic reversal, according to the preliminary findings from analyses being carried out by J.J. Villalain in Burgos. The accurate dating of the lowest sequence of Hummal is in progress. If we take into account stratigraphic and techno-typological observations, we assume that the Oldowan-like levels of the site should be older than one million years at least. These levels would be the oldest traces of human presence ever found in Syria.

Concluding Observations

Thanks to an exceptional archaeological sequence--preserving 60 or more archaeological levels from Archaic to Upper Paleolithic--Hummal has become a key sequence for the Paleolithic of the Middle East. It is among the longest Pleistocene stratigraphies of the Levant, comparable only with Tabun with which we can draw a temporary parallel. Eventually, the oncoming excavation program should help fill a few gaps and explain or interpret existing features. Correlations between the different sectors in the stratigraphy still remain to be clarified. The abso-

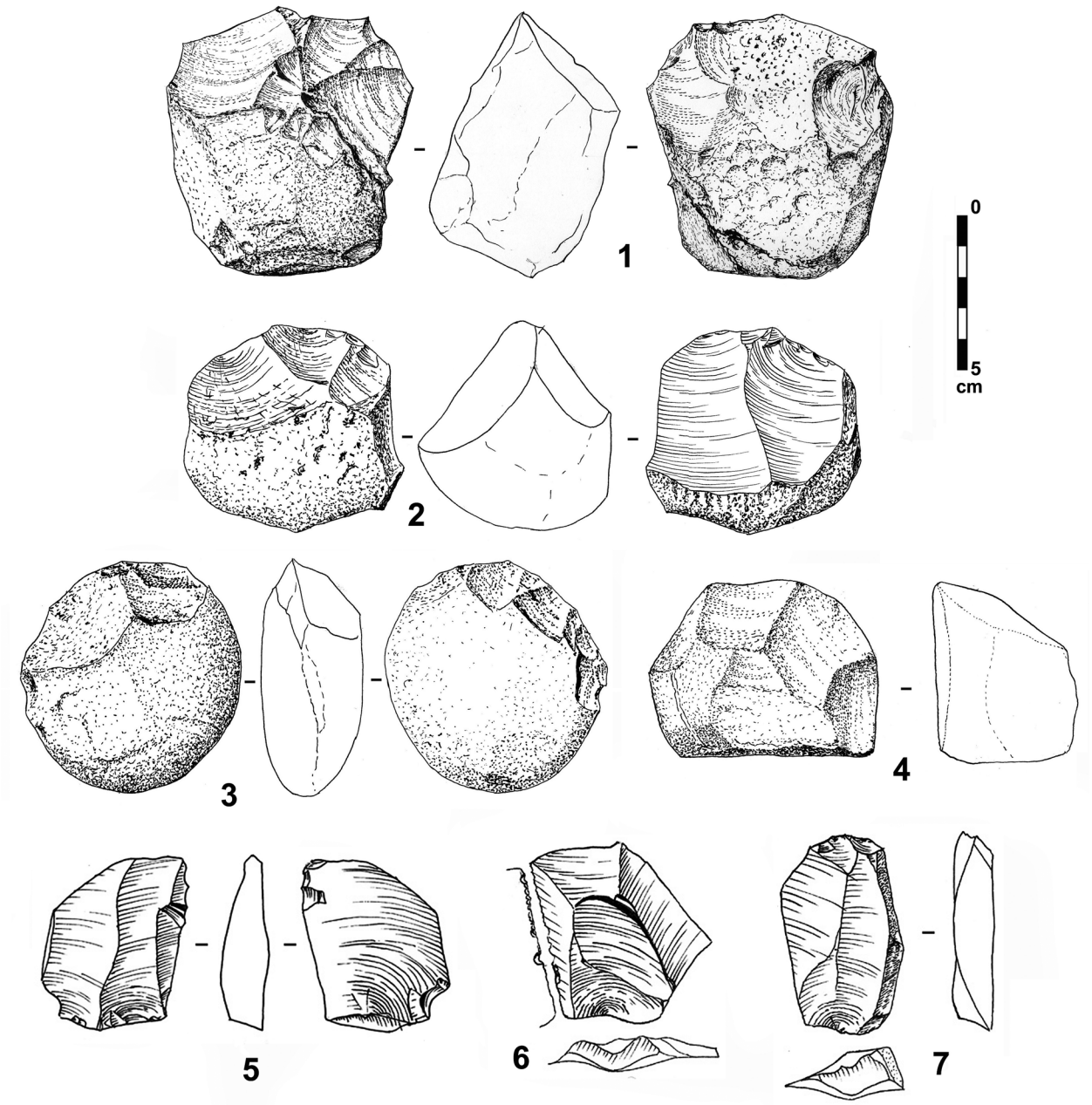

Figure 15 - Hummal Core and Flake industry, layer 18 (drawing J.-M. Le Tensorer).

lute chronology has to be completed, and although the natural radioactivity in the sediments makes it difficult to date some layers, efforts to apply a range of methods are ongoing.

From a cultural perspective, the sequence of Hummal should allow a better understanding of some major questions about the relationships between Acheulian and Core and Flake Industries and the transition from Lower to Middle Paleolithic. The enlargement of the excavation area should also provide new data on site function and help answer questions about the behavioural patterns of Pleistocene hominids.

Finally, the site of Hummal shows that a very deep cultural sequences may be encountered in open-air sites and that the steppe regions between the Mediterranean coast and the Euphrates river were also favourable territories for long-lasting human settlements, facts that should be taken into account in the currents debate about the alternate routes of human dispersal a different times during the Pleistocene.

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