

THE CONTRIBUTION OF HAYONIM CAVE ASSEMBLAGES TO THE UNDERSTANDING OF THE SO-CALLED EARLY LEVANTINE MOUSTERIAN

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Introduction

The Palaeolithic in the Near East is well known for the production of a large component of elongated blanks, even if it is not a continuous phenomenon. This is the case from the earliest occurrences during the late Lower Palaeolithic to the classical Upper Palaeolithic, through the Early Middle Palaeolithic (the so-called Early Levantine Mousterian) which is the main topic of this paper.

As has long been recognized, blade production in southwestern Asia appeared quite early, in Pre-Aurignacian and Amudian industries, but at few known sites: Yabrud (Syria) (Bakdach 1982; Rust 1950) and Haua Fteah (Libya) (McBurney 1967) for the former, in Tabun (Garrod 1956), Abri Zumoffen/Adlun (Copeland 1975; Garrod & Kirkbride 1961), Zuttiyeh (Gisis & Bar-Yosef 1974), Maslouk (Skinner 1970) and more recently Qesem Cave (Barkai *et al.* 2003, 2005, this volume) for the latter. Both assemblages have been found interstratified in Acheulo-Yabrudian levels; they are included in the Mugharan tradition and therefore are traditionally considered as late Lower Palaeolithic, although some scholars have grouped them with Middle Palaeolithic (for instance, Jelinek 1982). Stratigraphically, they always follow the Acheulian but predate the Levallois Middle Palaeolithic (Levallois-Mousterian). The Amudian has been dated to $264\ 000 \pm 28\ 000$ y in the deep archaeological sequence of Tabun (Tabun unit XI [Mercier & Valladas 2003]). More recently, however, the discovery and dating of a new long Amudian sequence seems to indicate that this Lower Palaeolithic blade-gear industry could have started more than 380 000 years ago and lasted until 200 000 years ago (Barkai *et al.* 2003, 2005).

The Amudian/Pre-Aurignacian assemblages have always been described as non-Levallois technologies and therefore were considered as contrasting with the Early Levantine Mousterian. Often grouped together on the basis of their blade characteristics, their non-Levallois technology and chronological position (Garrod 1956, 1970; Vishnyatsky 1994), they actually differ in several technological and typological points (Bordes 1977; Copeland 1975, 1983a; Jelinek 1990; Meignen 1994; Monigal 2001, 2002; Vishnyatsky 2000). This is especially the case for their

core-reduction strategies and retouched tool-kits dominated by Upper Palaeolithic tools in both industries. The latter are not of the same kind, however; burins, endscrapers and retouched blades for the Pre-Aurignacian, but mostly backed knives and some burins/endscrapers for the Amudian (Meignen 1994).

The case of the Hummalian, reported since its discovery to have a strikingly high proportion of blades (Hours 1982), is more controversial. It has sometimes been considered as part of the Lower Palaeolithic complex (Monigal 2001 and references therein). This is partially due to an initial erroneous interpretation of the stratigraphy (Besançon *et al.* 1981, 1982; Copeland 1985), but also to its uniqueness among blade assemblages at that time. Its stratigraphical position is now well established, following the field project directed by J.M. Le Tensorer (this volume). The finding that it is above the Acheulo-Yabrudian of the El Kowm basin, and beneath the Levallois Middle Palaeolithic assemblages, is somewhat particular. This situation allows us to consider whether it is part of the earlier complex (together with Amudian and Pre-Aurignacian) or part of the Early Levantine Mousterian. Due to its striking similarities, in terms of core reduction strategies and tool-kits, with the Hayonim Lower E and F assemblages (recently studied and dated, *cf. infra*), we consider it to be Early Middle Palaeolithic. Its stratigraphical position at the bottom of the Levantine Mousterian is in agreement with this hypothesis. Moreover radiometric dates previously published (Oxford Research Laboratory for Archaeology 1988, 1990) are now considered as unreliable, as environmental dosimetry measurements have shown problems of radioelement contamination in this area (Mercier & Valladas 1994). Preliminary results of a new radiometric dating programme in the context of the renewed excavations directed by J.M. Le Tensorer lend credibility to an early age for these industries (± 200 ka; Richter *et al.* 2011) and therefore confirm its contemporaneity with Hayonim lower E and F.

Unlike Amudian-PreAurignacian industries, more recent Early Middle Palaeolithic blade productions (the so-called Early Levantine Mousterian), when they are discovered in long archaeological sequences, are stratigraphically positioned above the Acheulo-Yabrudian complex and at the bottom of the Middle Palaeolithic sequence (in the cases of Tabun unit IX (Jelinek

1975), Hayonim lower E and F (Bar-Yosef *et al.* 2005) and Hummal Ia (Copeland 1985); they can alternatively be found simply above the Acheuleo-Yabrudian complex (in the case of Abou Sif C-D (Neuville 1951), or at the bottom of the Mousterian sequence (Douara unit IV [Akazawa 1979; Nishiaki 1989]). In other sites, they occur uniformly through the full short stratigraphic sequence (Rosh ein Mor, Nahal Aqev (Marks 1976) and therefore they are difficult to place in the regional archaeological scheme.

This Early Levantine Mousterian entity, usually defined as having a relatively high component of elongated blanks, a wide range of Upper Palaeolithic tool types and/or elongated retouched points (depending on the scholars), along with typical Middle Palaeolithic tools, has been recognized for more than 50 years. But it is only recently, with the progress in lithic technological studies and radiometric dating, that the importance, diversity and duration of this entity has been better assessed.

In this context, an interdisciplinary research programme, directed by O. Bar-Yosef, L. Meignen and B. Vandermeersch, was undertaken in Hayonim cave, between 1992 and 2000, in order to establish a chronological frame and gain a better understanding of the lithic blady assemblages already recognized during previous excavations in this site (Arensburg *et al.* 1990; Bar-Yosef *et al.* 2005). This new excavation project allowed us to expose a thick Middle Palaeolithic sequence (more than 7 m deep) including layer Upper E, in which true recurrent Levallois flake and point reduction strategy has been identified, and layers Lower E and F characterized by the elongated blank production that we present here. The lower sequence (Lower E and F) has been recently dated from 230 000 to 160 000 y ago (Mercier *et al.* 2007). These Lower E and F levels were recovered in the classical stratigraphical position of the Early Levantine Mousterian, at the bottom of the Mousterian sequence and above an Acheuleo-Yabrudian level (layer G). The latter was only slightly explored at the base of a deep sounding (layer G). The bedrock was never reached during these excavations.

Before focusing on recent informations, a rapid overview of the way these elongated productions were previously recognized and considered is interesting. It should help to understand how our current classificatory framework was created and evolved through several generations of prehistorians.

Brief historical review

Interestingly, in the 1930s and 1940s (and even later), Garrod, based on her experience at the site of Tabun, put the emphasis mostly on the similarities between the lithic assemblages from her different Levallois-Mousterian layers (level B: Upper Mousterian; levels C-D: Lower Mousterian), which were identified in fact mainly on faunal characteristics (Garrod 1934; Garrod & Bate 1937). She considered the Tabun D level (now characterized by its elongated products) as "of Levallois tradition, which is not unlike that of Tabun B" (Garrod 1934 in Monigal 2002); the blady character was not included in her definition.

Conversely, in the 1950 and 1960s, based on lithic assemblages from Abou Sif (Neuville 1951), attention was mainly focused

on the elongated retouched points, without specific chronostratigraphical meaning. Nevertheless, in Neuville's opinion, lithic assemblages from Abou Sif represented an early Mousterian facies which he considered at that time more or less unique typologically. For comparison, he mentioned the Tabun D assemblages but insisted on the presence in this site of more "normal" Mousterian tool types. Due to their original character, these Abou Sif lithic materials were isolated by contemporary prehistorians under the names of *Moustérien à pointes retouchées* (Perrot 1968), Abou Sif type (Skinner 1965) or *Moustérien à pointes allongées retouchées* (Howell 1959; Neuville 1951).

In the 1970s, renewed excavations by Jelinek in the key site of Tabun cave clearly established the chronostratigraphical position of these elongated productions, at the bottom of the Levallois-Mousterian sequence (Jelinek 1975). Researchers then focused on the early age of these elongated point assemblages (Hours *et al.* 1973) and the term Phase 1 was introduced by Copeland (1975). Thus, at that time, the general tendency was to insist on the chronological meaning of these assemblages, conceptualizing them in a unilinear model of evolution for the Middle Palaeolithic. Tabun Cave is then used as a key site for the Central Levant; but its relevance for the North and South Levant is considered as questionable for some scholars (see lively discussions between Copeland and Jelinek in the publication of the symposium *Préhistoire du Levant*, 1981a).

It is only at the beginning of the 1980s that the term "Early Levantine Mousterian" appeared in the literature, as equivalent to "Tabun D type" or "phase 1". Jelinek (1981b) as well as Marks (1981) introduced blades into the definition of this entity (interestingly their abundance was never clearly expressed in the definition of Garrod's layer D, her Lower Levallois-Mousterian, which she mainly characterized by points (Garrod & Bate 1937). Based on his large experience on Negev sites, Marks insisted on the frequent occurrence of Upper Palaeolithic tools in these blady assemblages, while Jelinek at that time still called it "Abou Sif type" (thus referring to the presence of elongated points).

Finally, since the mid 1970s, these Early Mousterian assemblages have been generally considered as quite homogeneous and related to the Levallois technology ("Levallois-Mousterian") (Bar-Yosef 1980; Copeland 1975; Jelinek 1982:92; Marks 1981; Shea 2001, 2003; Wallace & Shea 2006).

Marks & Crew (1972), and later Crew (1976) in his precursory work on Rosh ein Mor, largely documented the occurrence of prismatic cores, with "curved barrel shaped surfaces", alongside classical Levallois cores. Later, Bergman and Ohnuma (1983) insisted on the non-Levallois character of the blady assemblages from Hummal Ia, a striking industry discovered in the early 1980s (*contra* Copeland 1981; she later retracted her original opinion in favour of Bergman and Ohnuma's viewpoint (Copeland 2000). However all these relevant observations (presence of prismatic cores, prismatic blades, crested blades) were, for a long time, not taken into consideration because the conceptual framework for deciphering the different lithic production systems was not yet available and there was not yet a scientific interest for core reduction strategies and their social meaning ("*traditions techniques*"). The understanding of the Middle Palaeo-

lithic technology was still based at that time on a simplistic binary opposition between Levallois ("prepared core technology") and non-Levallois ("unprepared core technologies") (see, for instance, Copeland 1983b).

The next stage was reached with the development of the technological approach, and especially with the introduction of what is called in the French literature *conception volumétrique*, i.e., the geometric core construction and rules followed during the core exploitation in order to obtain specific end-products (Boëda 1988, 1994, 1995; Inizan *et al.* 1999). More precisely, Boëda (1988, 1990) pointed out differences between the Middle Palaeolithic Levallois method (conceptualized as a series of successive prepared flaking surfaces), and the Upper Palaeolithic Laminar concept (seen as a volume to be reduced in a continuous process). The latter is characterized by cores sometimes called "volumetric" in the recent literature (for instance, Monigal 2001:16-17) or "platform cores" (Conard *et al.* 2004).

At the beginning of the 1990s, this technological approach was developed on Middle Palaeolithic blady assemblages in the Levant. Since 1994, through the comprehensive study of characteristics of cores, end-products and by-products, several researchers have shown the presence of distinct core reduction strategies for the production of elongated blanks in the so-called Early Levantine Mousterian (Boëda 1995; Marks & Monigal 1995; Meignen 1994, 2000). In this context, Hayonim assemblages, recovered in well-controlled chronostratigraphical conditions during recent excavations, have played an important role, as they have been submitted to a detailed technological study and thus should be used as a general basis for deciphering the criteria on which different volumetric concepts/debitage methods could be identified.

Early Middle Palaeolithic blady assemblages

As was described before, Middle Palaeolithic blady assemblages located at the bottom of the Levantine Mousterian sequence are generally grouped under the name of Early Levantine Mousterian, or Tabun D type industries, or phase 1 Levantine Mousterian. When they are not recovered in long stratigraphical sequence and/or are not radiometrically dated, only their general similarity with this entity motivated prehistorians to name them "Early Levantine Mousterian" (for instance, Abou Sif, Sahba).

This Early Middle Palaeolithic is found in numerous sites throughout the Levant, with a large geographical repartition; it is known in different environments, on the coastal plain as well as in the marginal areas. In this paper, we consider not only Hayonim industries, on which initial research focused, but also several other previously studied blade-gearred assemblages that were stratigraphically recovered and in several cases, recently dated, in order to discuss not only the technological entity to which they belong, but also their chronological relationships.

Recent technological studies have shown that this Early Middle Palaeolithic entity is less homogeneous and more complex than was previously thought. It clearly includes assemblages that embody variations in their reduction strategies as well as in their tool-kit composition (Meignen 2007).

These assemblages all share significant proportions of blady blanks (I_{lam} = 20 to 60%) but this elongated production is never exclusive (see also Monigal 2001:16, 2002:524). Short blanks (flakes and points) are always present, produced by an additional separate core reduction strategy, most often of the Levallois type (short Levallois points, for instance, in Hayonim, Abou Sif, Rosh Ein Mor, Douara IV). As a consequence of these coexisting reduction strategies in the same assemblage, the laminar index is never very high (between 20 to 60, the latter in the case of Hummal). Moreover, it should be stressed that high or low proportions of blades may also result from the function of the site in the territory: these implements could have been carried into the site – imported (for instance, in the case of Tabun unit IX, considered as ephemeral occupations) – or taken away – exported (possibly the case in some Negev sites). In order to evaluate better the core reduction strategy involved in those sites, all by-products and cores must be taken into account, not only the laminar index.

The blady component, for a long time characterized as solely Levallois, clearly results from diversified reduction systems. Recent technological studies (in Hayonim lower E and F (Meignen 2000, 2007), Rosh Ein Mor (Marks & Monigal 1995), Hummal Ia (Boëda 1995, 1997; Wojtczak this volume) give evidence, in each assemblage, for diverse geometric constructions of cores (*conceptions volumétriques, sensu* Boëda) resulting in different morphologies of end-products (blades and elongated points).

In these assemblages, while the classical recurrent Levallois core reduction performed on relatively flat flaking surfaces results in wide thin elongated products, often with faceted platforms, the Laminar method (as we defined it in Meignen 1998), identified in the form of semi-pyramidal and semi-prismatic cores (or platform cores, following Conard *et al.* 2004), results in narrow, thick blades, with triangular or trapezoidal sections, and frequently plain butts.

In Hayonim lower E and F, few characteristic Levallois cores (fig. 1:a) have been identified which demonstrate the henceforth classical Levallois structure, as defined by Boëda (1986, 1995). The method is recurrent, which means that a series of wide, thin elongated blanks, extending down the greater part of the core length, have been struck from prepared platforms at either one or two ends of the core (here the flaking is more often bidirectional). Conversely, the Laminar method has been identified by cores which demonstrate a configuration quite different from those resulting from the Levallois concept. These "volumetric" cores show markedly convex debitage surface (contrary to Levallois cores) from which elongated blanks are struck in series from one (sometimes two) striking platform(s).

Unidirectional cores, the most frequent, display a highly convex cross-section, with a flaking surface expanding to lateral edges around a large part of the core periphery (*débitage semi-tournant/tournant*, in the French literature) (fig. 1:c-e). This was allowed by the special preparation of the striking platform, where removals set up the necessary angle for exploiting lateral edges of the core (more than 50°, often close to 80-90°). Most often semi-pyramidal (or pyramidal), they are of different sizes, including small size (fig. 1:e), geared to the production of large to

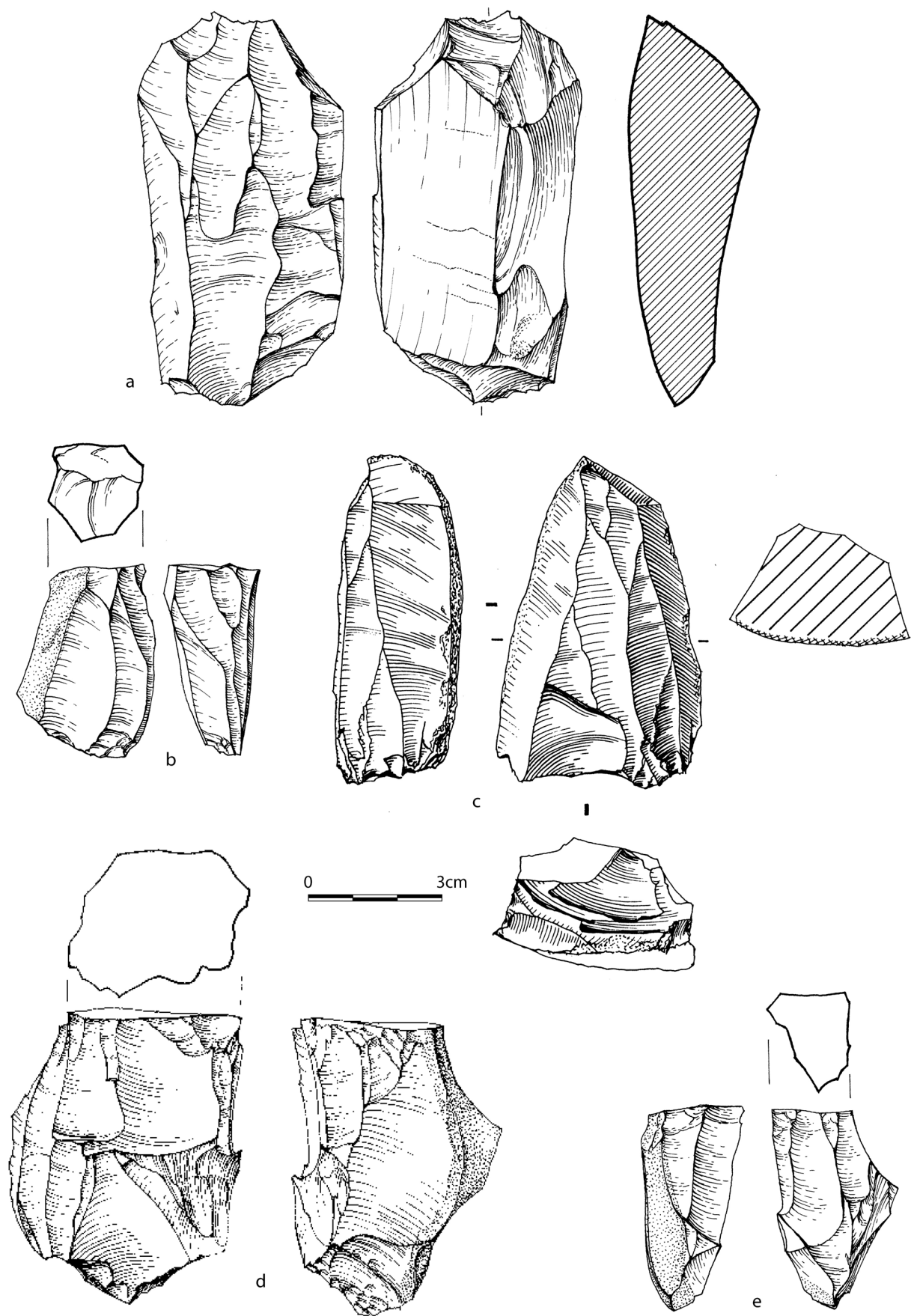


Figure 1 - Hayonim Lower E and F: a: cores, Levallois core (recurrent bidirectional); b: Laminar core "semi-tournant", bidirectional, opposed twisted striking platforms; c-c: Laminar cores: "semi-tournant", unidirectional.

small blades, and even microblades, as recovered at Hayonim, for instance (fig. 4:d, f-g). Bidirectional core exploitation has been identified in the form of cores, with two opposed platforms slightly twisted ("off axis") (fig. 1:b; fig. 2). From these two striking platforms, two reduction surfaces (one along the widest face, the other along the narrow face of the block) are exploited, whose intersection creates the necessary convexities for the blank detachment. The resulting debitage surface is, as in the previous case, highly convex, and the morphology of the core is "semi-prismatic". Such bidirectional exploitation has been also identified by specific overshoot blades which take off the opposite "off axis" striking platform (fig. 3:b-c). Crested blades have been sporadically involved in core shaping and maintenance (fig. 3:d).

The resulting end-products of this Laminar system are mostly narrow, thick blades of different sizes (fig. 4:a-c, e, g), including small blades/bladelets, the latter also eventually struck from "nucleiform burins" in the case of Hayonim (see, for instance, fig. 5:d). The characteristics of the striking platform (simple or absent preparation), the bulb of percussion (salient) and the ventral surface of the products suggest direct percussion by hard hammer.

Technological studies presently available show that, in most of Middle Palaeolithic blade-gear industries, the two reduction strategies (Levallois and Laminar methods), as described here in the Hayonim Lower E and F assemblages, coexisted in each assemblage but did not occur in equal frequencies (Meignen 2000, 2007). At sites such as Hayonim lower E and F, Hummal Ia (Hummal level 6, in Le Tensorer's excavations), and probably Abou Sif, end-products and cores from the Laminar concept seem to be dominant, even largely prevalent in the case of Hummal 6 (Wojtczac, this volume). Conversely, in other cases, the main emphasis of blade production is on the Levallois core reduction at the expense of the Laminar concept (Tabun IX (Meignen 2000; Monigal 2002:307); Rosh Ein Mor (Monigal 2002:307, contra Marks and Monigal 1995) (fig. 6), Nahal Aqev, and probably Douara IV). In Tabun IX, it seems that only the recurrent Levallois method has been involved (Meignen 1998, 2000; Monigal 2002:307).

Moreover these different prevailing core reduction strategies appear to be generally associated with varied retouched tool-kits. Regarding retouched tools, early Levantine Mousterian assemblages have been usually characterized, depending on the authors, by a relatively high proportion of elongated points (Copeland 1975; Jelinek 1981b; Marks 1981) and/or a wide range of Upper Palaeolithic tools (Bar-Yosef 1994; Marks 1981, 1992; Shea 2003) alongside the typical Mousterian tools (scrapers, denticulates and notches). More careful examination of the presently available data shows a more refined picture, however.

Some assemblages are clearly dominated, alongside classical Mousterian types, by elongated retouched points (fig. 7) and retouched blades, as described in Hummal Ia (Copeland 1985), Abou Sif (Neuville 1951) and Hayonim lower E and F (Meignen 1998, 2000, 2007) (fig. 8:a-c, e-g; fig. 9). These most distinctive elongated tools have often been heavily transformed by scalar

retouch, which is localized at the tip and/or more or less spread along the lateral edges. In Hayonim as well as in Hummal and Abou Sif, the pointed tools grade from symmetrical retouched points (elongated Mousterian points), to asymmetrical points (also called "*pointes incurvées*" by Neuville [1951]) to backed, distally curving, pointed "knives" (Copeland 1985). The small range of elongated points with abrupt retouch, especially near the sharply-pointed tip, called "Hummalian points" in Hummal Ia (Copeland 1985, 2000:103), has also been recognized in Hayonim lower E and F. According to Copeland, they were quite rare in Abou Sif (1985:181). These tools are often fashioned on narrow thick elongated blanks struck according to the Laminar method. In these assemblages, Upper Palaeolithic tool types are rare. But it should be noted that in some units from Hayonim they are well represented in the form of true burins and nucleiform burins (fig. 5). Nevertheless, the Mousterian tool types (especially if we include the elongated retouched points) remain the most distinctive tools in these assemblages.

On the contrary, few assemblages happen to contain significant proportions of different Upper Palaeolithic tool types (burins, endscrapers, truncations, borers; IIIess index between 20 to 30; references in Monigal (2002, fig.12:2) and a lower ratio of elongated retouched points. In these assemblages, the latter are made on thinner, wide, elongated blanks with prepared striking platform. They are often only slightly retouched, in contrast with those of the first group. These more balanced tool-kits have been recognized in sites such as Rosh Ein Mor (Crew 1976), Ksar Akil XXVIII (if considered as Early Middle Palaeolithic [Marks & Volkman 1986; *contra* Meignen & Bar-Yosef 1992] and to a lesser extent (lower proportion of Upper Palaeolithic tools), in Nahal Aqev (Munday 1977) and Tabun IX (Jelinek 1975). Most of them seem to be developed in assemblages characterized by the prevalence of Levallois core reduction strategies for elongated production.

In fact these two separate groups of blade-gear assemblages defined on technological and typological criteria (schematically, predominance of the Laminar method/elongated retouched points and retouched blades versus prevalence of the Levallois method/Upper Palaeolithic tool types) have already been globally recognized by Monigal (2002) on the basis of lithic studies known at that time. She finally considered these two groups as two chronologically successive entities, with an abrupt technological break between them (Monigal 2002:529). Contrary to some authors who at that time had already placed the Hummalian in the Early Levantine Mousterian (for instance, Bar-Yosef 1998; Copeland 2000), on technological and typological criteria (non-Levallois technology as the sole reduction strategy; very elongated, thick, heavily retouched Mousterian points, and in general a pronounced Middle Palaeolithic character), she separated the Hummalian from the Early Levantine Mousterian and considered the former as a Lower Palaeolithic blade-producing industry. The Early Levantine Mousterian was then represented by the Negev and Tabun IX collections.

However, more recent studies of Hayonim Lower E and F assemblages, viewed in the context of presently available dates, allow us to reconsider this hypothesis. Our results demonstrate that these two groups are not clearly separated and certainly

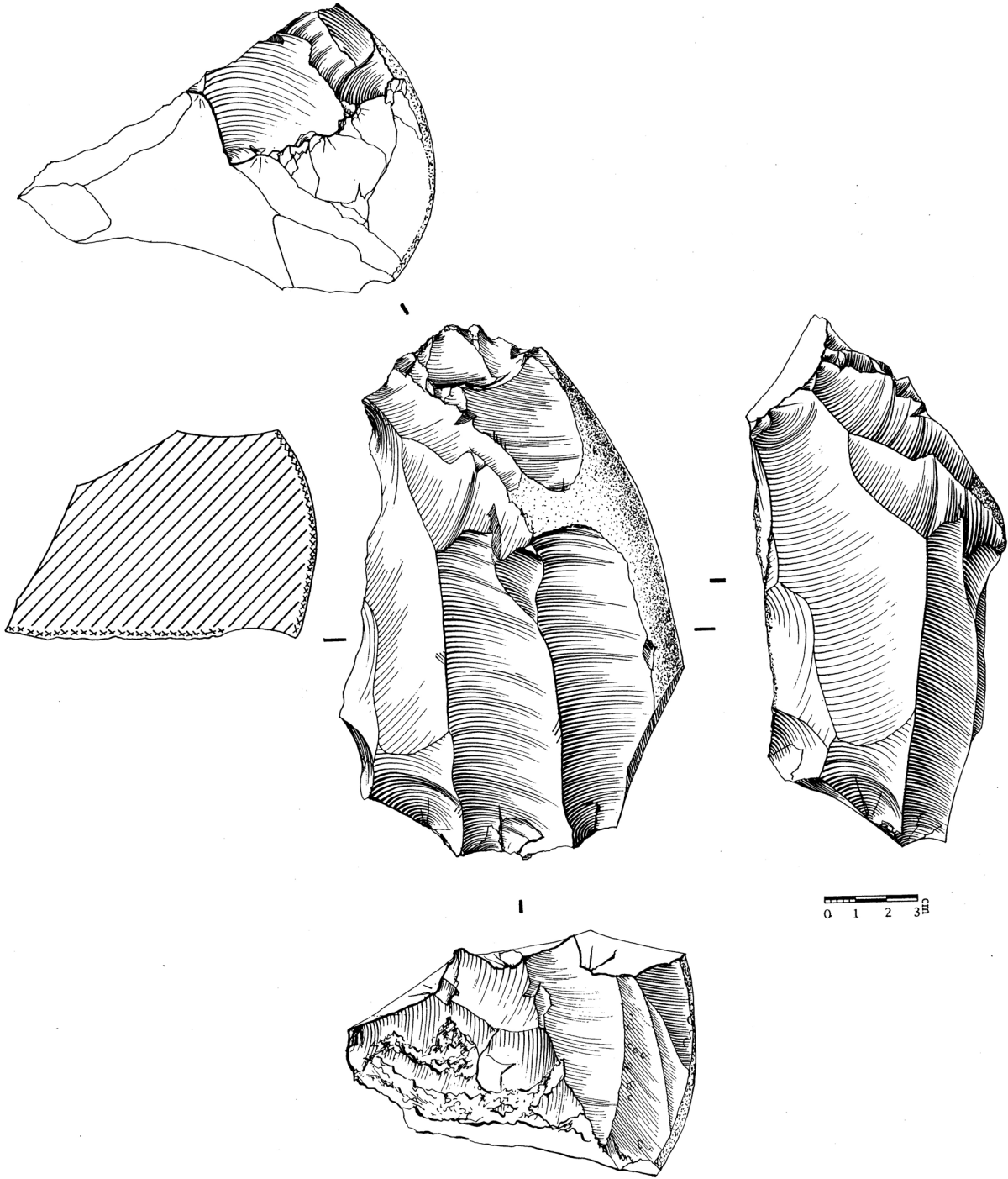


Figure 2 - Hayonim Lower E and F. Laminar core "semi-tournant", bidirectional, opposed twisted striking platforms.

not chronologically distinct. The more balanced picture of all blady assemblages we previously exposed, together with recently obtained results for Hayonim cave (Mercier *et al.* 2007) and Hummal level 6 (Richter *et al.* 2011) chronologies do not allow to separate strictly two different entities. Indeed, in all the assemblages, both reduction strategies (Laminar and Levallois) were involved in blade production, albeit not equally. Moreover the Upper Palaeolithic tool component, which characterized the Rosh ein Mor/Tabun group, appears to be represented as well in the assemblages dominated by the elongated retouched points, in the form of classical burins as we recently recognized

them in Hayonim cave (fig. 5). These short comments already show that the suggested break between the two groups cannot be accepted even if some different trends can be identified. Moreover new dating results from Hayonim cave (Mercier *et al.* 2007), in which blady assemblages lasted for a long period of time, from 230 000 to 160 000 y ago, and those from Hummal level 6 dated from the same range of time, disprove the chronological succession of the two groups suggested by Monigal. Indeed, based on TL dates (Mercier *et al.* 1995; Mercier & Valladas 2003), the Levallois-dominated assemblages (also characterized by a developed Upper Palaeolithic tool kit) that Monigal con-

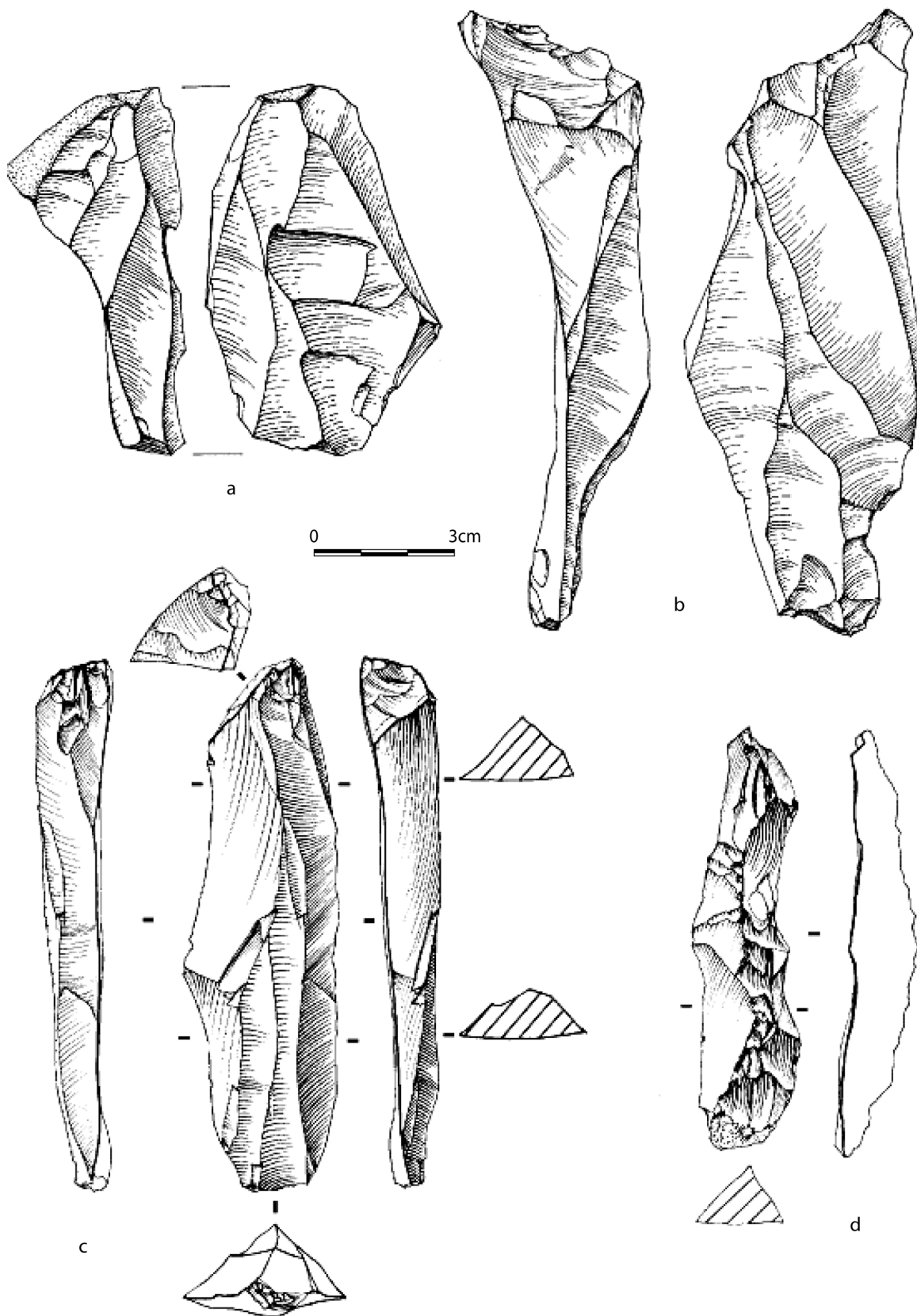


Figure 3 - Hayonim Lower E and F overshot products. a: from unidirectional core; b, c: from bidirectional cores, opposed twisted striking platforms; d: crested blade.

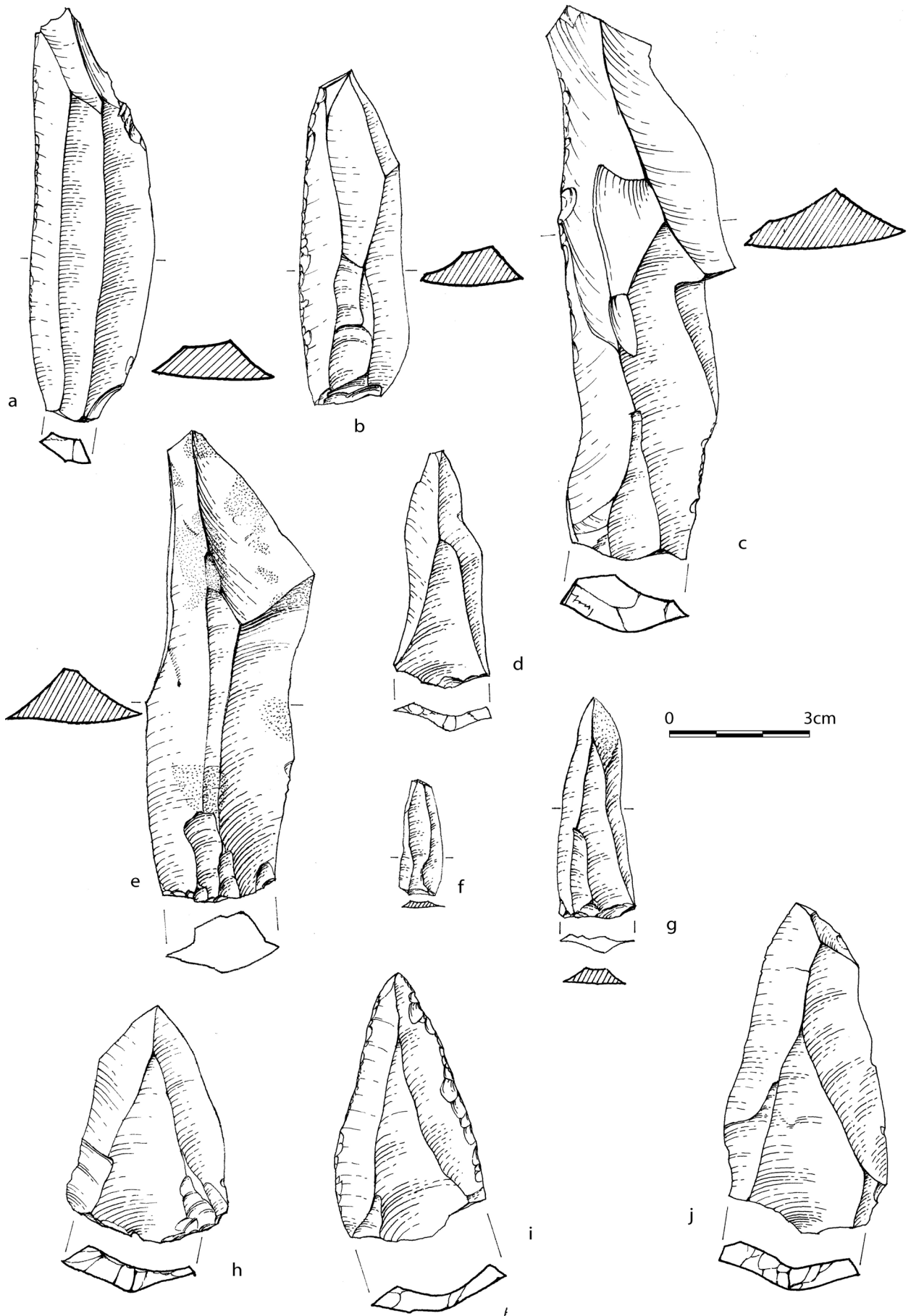


Figure 4 - Hayonim Lower E and F. a-c, e: narrow thick blades from the Laminar method; d, f, g: small blades/"bladelets"; h-j: short triangular Levallois products.

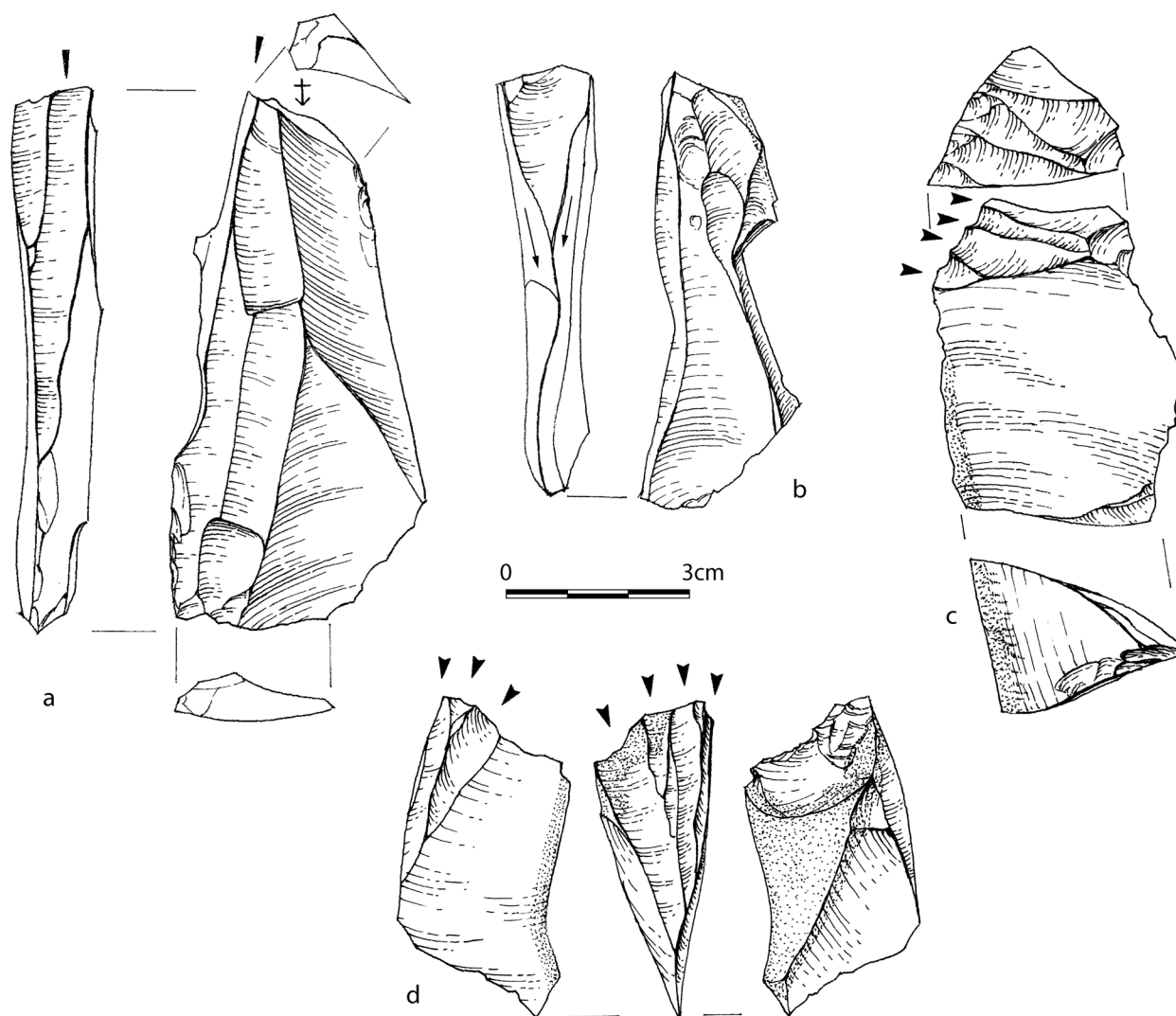


Figure 5 - Hayonim Lower E and F. Multiple burins and "nucleiform" burins.

sidered as the most recent entity, in fact predate (in Tabun unit IX: 270 000 y, Mercier & Valladas 2003) or are roughly contemporaneous (in Rosh Ein Mor : 200 000 y, Rink *et al.* 2003) with Laminar assemblages rich in elongated retouched points, such as those from Hayonim lower E and F (160 000–230 000 y, Mercier *et al.* 2007) and Hummal (\pm 200 000 y, Richter 2011).

Conclusions

In a first step, in the early 1990s, a few technological studies of the so-called "Early Levantine Mousterian" showed that distinct core-reduction strategies have been used in order to obtain the elongated blanks observed in this entity (Boëda 1995; Marks & Monigal 1995; Meignen 1998, 2000). More recently, still ongoing research programmes based on wider technological and chronological studies have drawn a new picture of this period.

As was described in Hayonim and other assemblages, two distinct reduction strategies involving both Levallois and non-Levallois (Laminar) concepts occurred simultaneously in order to obtain the same "tool", at least from a typological point of view ("elongated point", "blade"). We thus can ask ourselves why two different core reduction strategies were used to produce the

same tool? As was previously mentioned, the morpho-functional attributes of the end-products (blades and elongated points), i.e. their function, varied according to the core reduction involved. In order to test such an assumption, use-wear analysis was undertaken by S. Beyries (CEPAM, France) on a series of elongated tools from Hayonim layer F. This preliminary work schematically demonstrates that thick, robust and elongated retouched tools from the Laminar method were mainly used in hide and bone processing activities, while wider, thinner blanks from the Levallois reduction strategy were more often involved in butchery activities. The former group comprises quite intensively retouched implements, not a surprising result as they are used in activities with intrinsically high edge-attribution rates (Meignen & Beyries, oral presentation 2008). These first results clearly suggest that the aim of the two *chaînes opératoires* was not the same in terms of potential use, even though scholars have a tendency to put them under the same label.

Contrary to the prevailing idea, this early Middle Palaeolithic complex which developed from around 270 000 to 160 000 years ago, comprises quite diversified industries in which the blady component appears as the main common distinctive end-product. The most recent results highlight a mosaic of as-

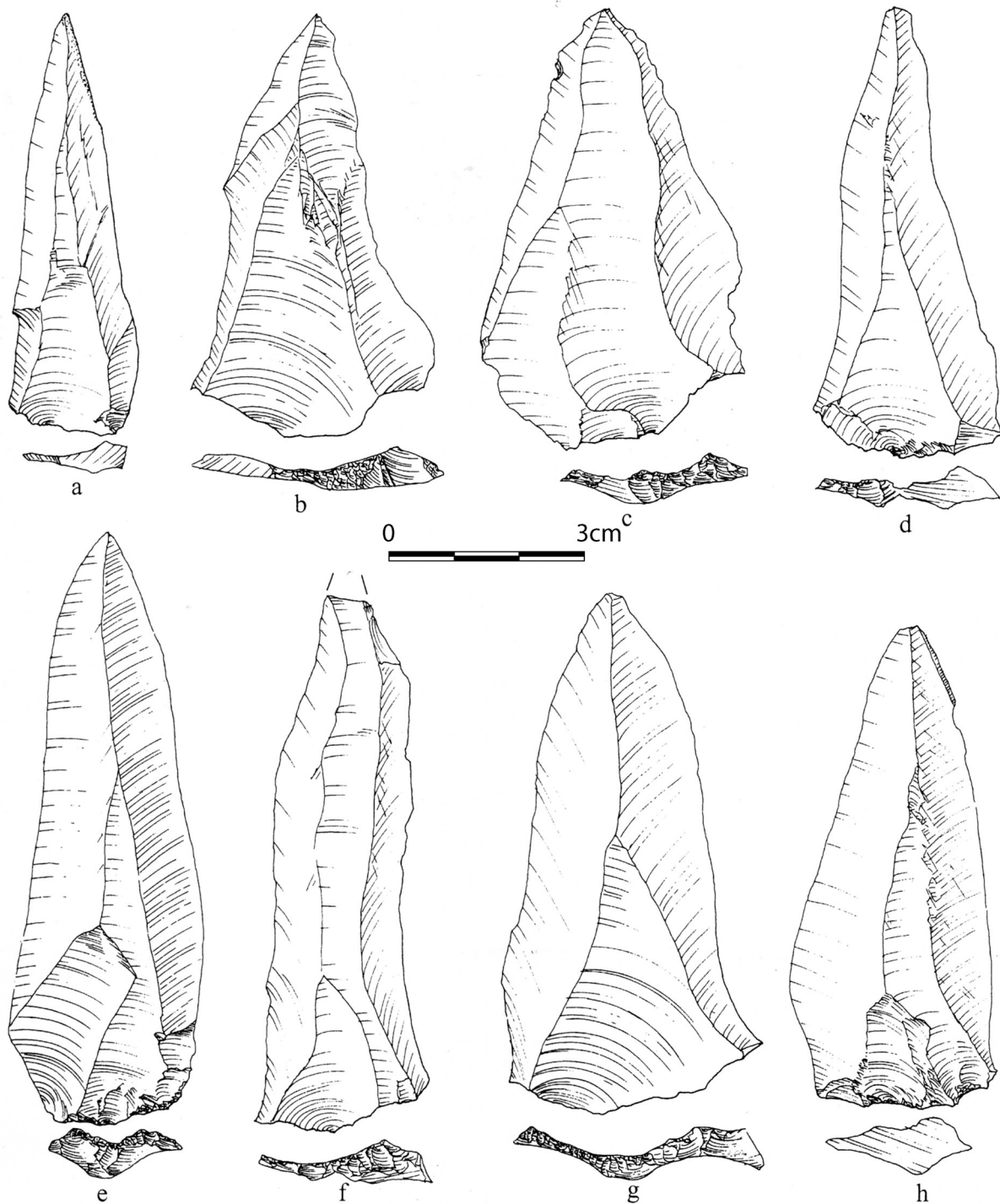


Figure 6 - Rosh Ein Mor, short and elongated triangular Levallois products (from Monigal 2002).

semblages combining both reduction strategies, Levallois and Laminar, in different proportions, each of them likely associated with special tool-kits. Thus the picture we have now is not of a large homogeneous entity, as is often described using designations such as "Early Levantine Mousterian", "Tabun D type" or "Levallois-Mousterian phase 1", but rather the co-existence, on a broad time scale, of human groups belonging to the same large "technical sphere" (Leptolithic tradition) and differentiating themselves by specific combinations in terms of technical systems and tool-kits. Interestingly, the heterogeneity

recognized here is reflected in the repeated difficulties experienced by scholars during the previous decades in identifying the Levallois or non-Levallois character of assemblages such as those from Abou Sif and Hummal that we exposed in our brief historical review (*cf supra*).

As a consequence of this heterogeneity, it is no longer possible to subsume within a single term, such as "Tabun D type" or "Abou Sifian" (these two terms represent only part of the identified variability) or "Early Levantine Mousterian" (with its

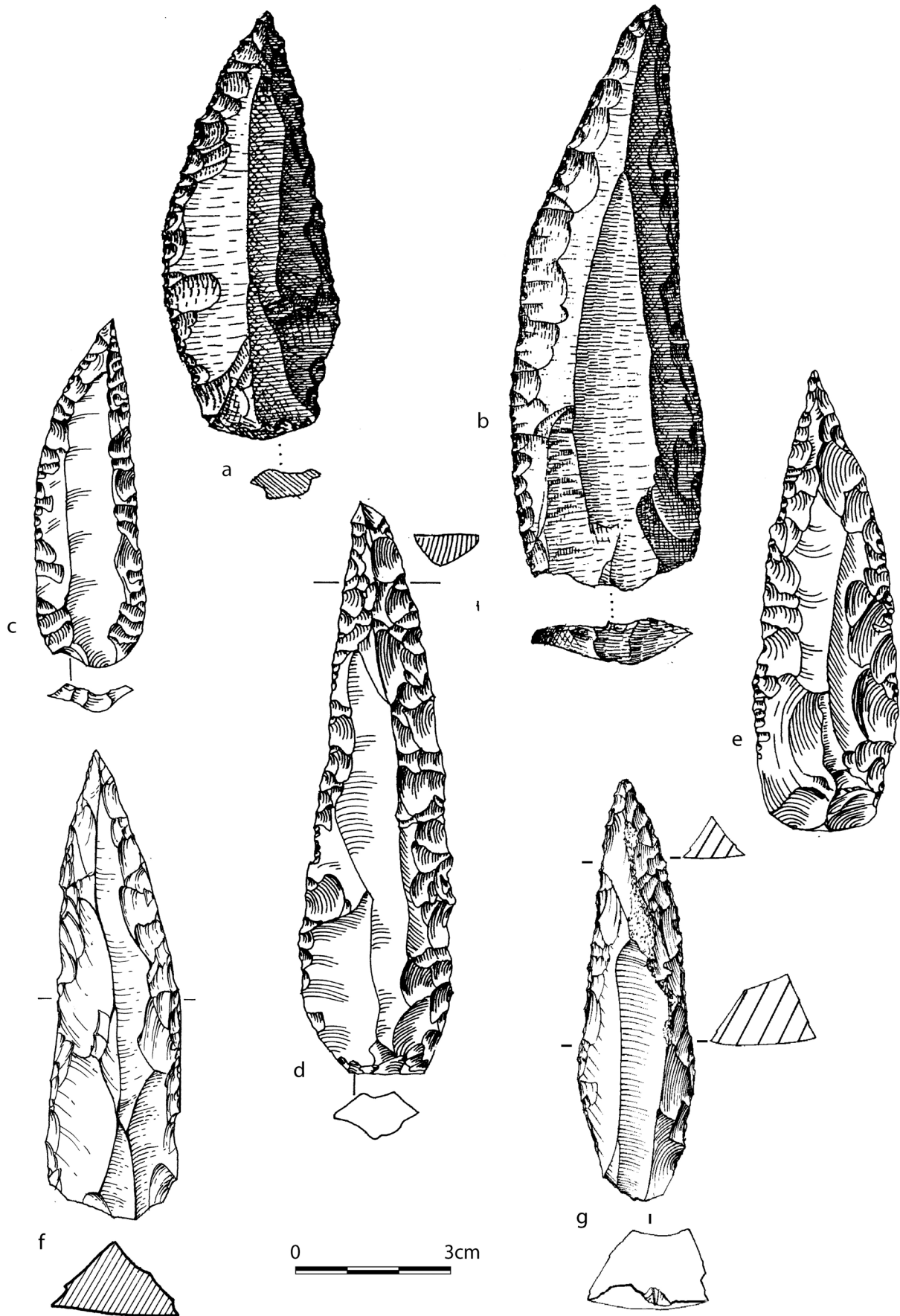


Figure 7 - Thick elongated retouched points. a, b: Abou Sif (from Neuville 1951); c-e: Hummal 1a (from Copeland 1985); f-g: Hayonim lower E and F.

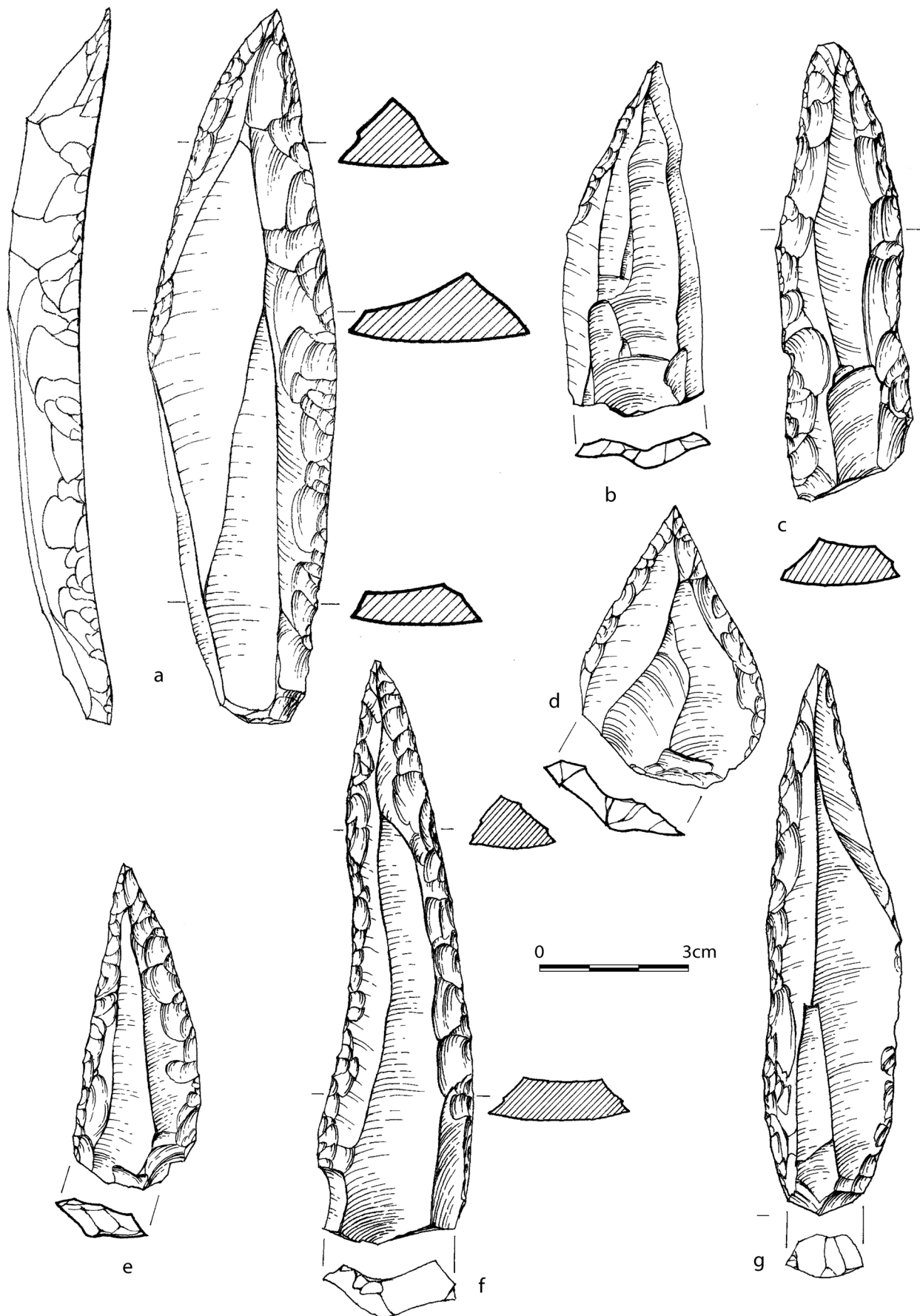


Figure 8 - Hayonim Lower E and F. a-c, e-g: elongated retouched points; d: short retouched point (Mousterian point).

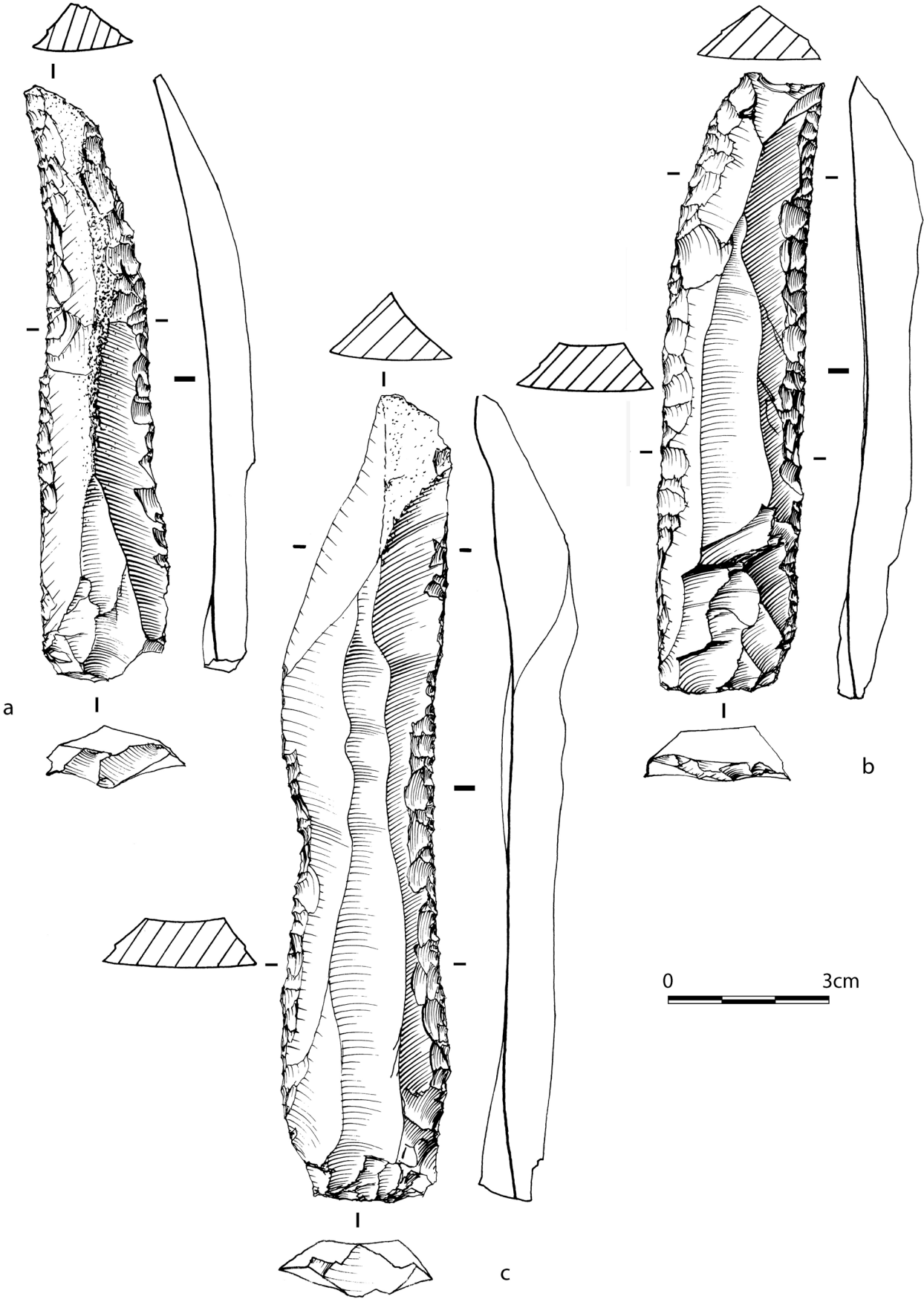


Figure 9 - Hayonim Lower E and F. a-c: retouched blades on narrow thick blanks.

chronological implications), all assemblages which only share the blade character but differ in terms of core reduction strategies, tool-kits and chronology.

In the present state of our knowledge, most of the systematic and intentional blade productions developed at an early date in the Middle Palaeolithic sequence. However, a few blade-oriented assemblages – such as Ain Difla and Nahal Aqev, which are technologically similar to "Early Levantine Mousterian" and thus are labelled as such – appear to be more recent (contemporary with Late Middle Palaeolithic) (Lindly & Clark 1987, Schwarcz *et al.* 1979), a statement that should be confirmed by more careful dating and stratigraphic control. Marks (1992) pointed out that the so-called "Early" Levantine Mousterian can be temporally late.

This suggests first that the presence of blade-gear assemblages should not be considered as a chronological criterion (as equal to Early Middle Palaeolithic), and also renders the current nomenclature inappropriate. In fact, we should avoid the term "Early Levantine Mousterian" for all these elonga-

ted assemblages and rather use a general term such as "Middle Palaeolithic blade assemblages", adding "early" or "late" when the chronostratigraphical position is known. We should be precise also about the main characteristic (predominance of elongated points and blades, frequent occurrence of UP tools). Then it will be easier to discuss the meaning of these differences, whether they are related to the techno-economic situation or are really significant in terms of technical traditions.

Finally it should be stressed that while the elongated products (retouched or not) obtained from diverse production systems are probably the most distinctive trait of these early Middle Palaeolithic assemblages, most of them also display a component of short blanks, struck from a separate core reduction, often using the Levallois method. This means that technical needs at that time were fulfilled by different *chaînes opératoires*. This indicates a complexity never reported for the following Middle Palaeolithic, during which the technical repertoire was finally focused on the Levallois method with all its internal variability in terms of modalities and end-products.

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