A Missing Chapter of *The Desert Fayum*: Fayum Lithic Artefact Collection in the Allard Pierson Museum, Amsterdam

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Introduction

In the 1920s, the British archaeologist Gertrude Caton-Thompson carried out extensive archaeological research in the Fayum under the auspices of the British School of Archaeology in Egypt and the Royal Anthropological Institute of Great Britain and Ireland. She surveyed many sites on the north-eastern shore of Lake Qarun (**fig. 1**), excavating some of them. Through the survey and excavations, she collected a large number of artefacts and brought them back to Britain. The result of her fieldwork and the study of artefacts were published in 1934 in two volumes entitled *The Desert Fayum*. This publication is still regarded as the most authentic and informative archaeological report on the history of the Fayum from the Epipalaeolithic through to the Neolithic, Predynastic and Old Kingdom to the Greco-Roman periods.
Masterpieces of her artefact collection remained in the Petrie Museum of Egyptian Archaeology in University College London and the British Museum

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in London, but the rest of her collection were distributed before the publication of the report. While a number of Fayum artefacts were sold off to many local museums throughout Britain in order to financially facilitate further field research, many artefacts were generously donated to universities and research institutes both within and outside of Britain as study materials. According to her distribution list on *The Desert Fayum* (Caton-Thompson & Gardner 1934: xiv), her collection was finally distributed to 31 locations in nine countries, including Australia, Britain, Canada, Egypt, France, Ireland, Japan, the Netherlands, and the United States of America.

The Fayum lithic artefacts dealt with in this article come from a collection that is at present housed in the Allard Pierson Museum in Amsterdam, the Netherlands. The collection was initially given to the private museum of a banker, Constant Willem Lunsingh Scheurleer in The Hague in 1926, a gift in appreciation for his financial contribution to field research. However, due to an economic crisis, the collection was sold off and purchased by the Allard Pierson Museum in 1934. The collection is accompanied by a list of objects written by Caton-Thompson herself and includes their original inventory number as well as the number given by the Allard Pierson Museum. Furthermore, we have the information as to which site in the Fayum the pieces were found. Therefore, it is significant to publish this forgotten collection in order to shed some new light on her work and augment our knowledge about the material culture of the Fayum.

Lithic Artefacts in the Allard Pierson Collection

The total number of Fayum lithic artefacts in the Allard Pierson Museum is 88 (**Table 1**) and does not include other kinds of artefacts such as querns, grain rubbers, pottery sherds, bone tools and shell beads. Three of the 88 lithic pieces are cores; the others are retouched and/or polished tools. All complete tools are illustrated in **fig. 2-11**, with three cores and one broken knife handle (**fig. 12-15**). The prehistoric tools in the Allard Pierson Collection represent most prehistoric tool classes described in *The Desert Fayum*, apart from some very rare tool classes such as halberds and ground points. Several tools are dated to later periods representing the Predynastic and Old Kingdom. Therefore, it seems that Caton-Thompson took care to include as many tool classes as possible from different periods in each of distributed packages.

Caton-Thompson neatly recorded the provenance of all artefacts and inscribed them on the surface of each artefact in ink. Most of these inscriptions are still readable, hence it is easy to identify from which site an artefact derived. In the Allard Pierson Collection, only four artefacts have no information about their provenance due to the ink inscriptions no longer being visible.

The Allard Pierson Collection covers almost all surface sites that Caton-Thompson visited and reported on. However, artefacts that were excavated at well-known Neolithic sites such as Kom K, Kom W, Upper and Lower K Pits are not included in the collection. Her surface sites are clustered in two distinct areas on the east and west sides of Moeris Bay located on the north-eastern shore of Lake Qarun (**fig. 1**). The eastern cluster includes Site L, Bench Mark L, Site V, Site X, Site Z, Camp II and Khashmet ed-Dib, whereas the western cluster includes Qasr el-Sagha, Site N, Site O, Site R, Site S, Site T and Dimai. Therefore, it appears that she took care to include as many artefacts

from different sites as possible in each distribution package. Khashmet ed-Dib is the place where she pitched her first camp during the 1924-1925 season's fieldwork. However, no further description of this site has been given in the text of *The Desert Fayum*, though it is indicated on her map; as a consequence, the artefacts from this site are definitely new to us.
In the description of tools in the text and table of this article, Caton-Thompson's tool class terminology is employed without any change. Nonetheless, some chronological considerations on prehistoric tool classes are necessary, because her original assumption on tool chronology is no longer acceptable.

Some Considerations on the Chronology of Fayum Prehistoric Tool Classes

Caton-Thompson roughly classified all Fayum prehistoric tools into 25 classes (Caton-Thompson & Gardner 1934: 19-22). Although the names and sequence of her tool classes are definitely not logical, they are presented here without change. Her tool classes are:

1. ground and polished axes
2. polishes and flaked axes
3. flaked axes
4. adzes
5. gouges
6. planes
7. knife blades
8. daggers, spears, or javelin heads
9. halberds
10. chisels
11. ground points
12. triangular, or slightly hollow-based arrowheads
13. concave-based arrowheads
14. sickle blades
15. leaf-shaped points
16. partially retouched, leaf-shaped points
17. pebble-butted points/knives
18. pebble-backed knives/scrapers
19. side-blow flakes
20. celtiforms
21. scrapers
22. backed blades
23. trihedral rods
24. tanged arrowheads
25. leaf-shaped arrowheads

A meticulous study on the vertical distribution of tools at many surface sites and the excavations of *in situ* tools at Kom K and Kom W allowed Caton-Thompson to understand what tool classes were distributed at what elevations, and to recognise two distinct groups of tool classes according to these elevations. For instance, axes and sickle blades occurred only at higher elevations; their occurrence at such elevations being confirmed at Kom K and

Kom W. The number of backed blades gradually decreased as the elevation rose. Pebble-butted or backed tools were most numerous at middle elevations, though were sparsely seen at lower and higher elevations. Based on such observations, one group of tool classes frequently found at higher elevation was named 'the Neolithic A group,' and another group of tool classes at lower elevation was named 'the Neolithic B group,' with the co-occurrence of several A group tool classes and B group tool classes at middle elevations also observed. Since Caton-Thompson assumed that the lake level continued to decrease through the Neolithic Period, she related the vertical distribution pattern of the A group and B group tools to the lowering lake level. She concluded that cultural changes were at work on the slope of the lakeshore, and that elaborate A group tools degenerated into crude B group tools (Caton-Thompson & Gardner 1934: 55-67).

Accordingly, Caton-Thompson concluded that ground and polished axes (1), polished and flaked axes (2), adzes (4), knife blades (7), daggers, spears, or javelin heads (8), halberds (9), chisels (10), ground points (11), triangular, or slightly hollow-based arrowheads (12), concave-based arrowheads (13) and sickle blades (14) belong to the A group; whereas, backed blades (22) exclusively belong to the B group and tanged arrowheads (24) are likely to belong to the B group. She speculated that flaked axes (3), gouges (5), planes (6), leaf-shaped points (15), partially retouched leaf-shaped points (16), pebble-butted points/knives (17), pebble-backed knives/scrapers (18), side-blow flakes (19), celtiforms (20) and trihedral rods (23) might probably belong to both A and B groups, because they had been found at middle elevations. She also suggested that some of the scrapers (21) and leaf-shaped arrowheads (25) might be dated to the post-Neolithic. On the other hand, she left the date of the majority of: tanged arrowheads (24) and leaf-shaped arrowheads (25) uncertain (Caton-Thompson & Gardner 1934: 19-22). It was revealed later that Caton-Thompson's B group should have been attributed to the Epipalaeolithic and that the A group should definitely be attributed to the Neolithic. According to radiocarbon dates, the time span of the Fayum Epipalaeolithic is approximately 7100-6000 cal. B.C. (Hassan 1988: 142-143 & fig. 2) and the time span of the Fayum Neolithic is either approximately 5200-4500 cal. B.C. (Hassan 1985: 105-106; 1988: 141 & fig. 2), or 5400-4400 cal. B.C. (Hendrickx 1999: 18). It has become common in contemporary literature for the Fayum Epipalaeolithic to be referred to as the Qarunian and the Fayum Neolithic to be called the Fayumian (Hendrickx & Vermeersch 2000; Midant-Reynes 2000). It has also been argued that the Fayum Epipalaeolithic assemblage falls within the general Nilotic and North African microlithic tradition and that there was a considerable chronological and technological hiatus between the Fayum Epipalaeolithic and Neolithic cultures (Wendorf & Schild 1976: 317*ff*). If this argument is true, it must be considered that some of the tool classes that were assumed by Caton-Thompson as belonging to both the A group and B group, must accordingly belong to either the Qarunian or Fayumian. The tool classes that have not been found in the Qarunian assemblages through excavations should belong to the Fayumian, or later cultures. Alternatively, the tool classes that were assumed by Caton-Thompson to belong to both the A group and B group may possibly belong to the transitional period between the Qarunian and the Fayumian.

Much new data on lithic assemblages in Egypt during the Early Holocene has been published in the past decades, and some synthetic studies on the Early Holocene lithic assemblages in Egypt have also been attempted (Kobusiewicz

1996; Vermeersch 1992). Comparable materials have become available after the publication of Caton-Thompson's report on her Fayum research, these include: the Elkabian assemblage in the Nile Valley of Upper Egypt (Vermeersch 1978), the Shamarkian assemblage in the Nile Valley of Nubia (Schild *et al.* 1968), the Siwan assemblage in the Siwa Oasis region close to the western border of Egypt (Cziesla 1989; Hassan & Gross 1987), the Lobo assemblage in the east of the Great Sand Sea (Klees 1989), the 'Bedouin Microlithic' assemblage and other Epipalaeolithic assemblage in Kharga Oasis of the Western Desert (Caton-Thompson 1952; Wendorf & Schild 1980) and the Early Ceramic El Nabta/Al Jerar assemblage in the Nabta-Kiseiba region close to the southern border of Egypt (Wendorf & Schild 2001; Wendorf *et al.* 1984). Comparisons of Fayum artefacts with contemporary lithic assemblages from all over Egypt, while referring to the widely-used Tixier typology of Epipalaeolithic tools in North Africa (Tixier 1963), would be useful in order to determine the attribution of several undated Fayum tool classes to the Qarunian.

Furthermore, comprehensive catalogues of Neolithic lithic artefacts from Merimde Beni Salama and El Omari, which are contemporaneous with the second half of the Fayum Neolithic according to radiocarbon dates, were recently published (Debono & Mortensen 1990; Eiwanger 1984; 1988; 1992; Hendrickx 1999: 18-19 & 60-61). In particular, Merimde Beni Salama provides a sequence of technological development in Neolithic lithic artefacts obtained from a stratigraphic context. Therefore, they provide invaluable comparable examples in determining the attribution of several undated Fayum tool classes to the Fayumian.

It may be said that the trihedral rods (23) can be dated to the Qarunian and somewhat later, because they look identical to Tixier's Type 16 and indeed, this type of tool often appears in the Epipalaeolithic assemblages mentioned above. The latest example of trihedral rods has been found in the earliest level (*Urschicht*) of Merimde Beni Salama, which still bears the microlithic tradition and should probably be dated to the early-middle 6th millennium cal. B.C.; however, they disappear in the subsequent level (*Schicht II*), which was dated to the first half of the 5th millennium cal. B.C. (Eiwanger 1984; 1988).

Other tool classes under consideration are not easy to date because of the limited number of solid comparable examples. It is doubtful that: flaked axes (3), gouges (5), planes (6), leaf-shaped points (15), partially retouched leaf-shaped points (16), side-blow flakes (19), celtiforms (20) and scrapers (21) were present in the Qarunian. As far as we know, these tool classes first appear in the northern half of the Egyptian Western Desert including Kharga, Dakhleh, Farafra Oases and Djara around 5800-5400 cal. B.C. (Barich & Hassan 1987; Caton-Thompson 1952; Gehlen *et al.* 2002; Kindermann 2003; 2004; McDonald 1991; Riemer 2003), precisely representing the transitional stage between the Qarunian and the Fayumian, and having never appeared during the previous period, which is contemporaneous with the Qarunian. Furthermore, ground and polished axes (1) are also sporadically included in the same assemblage of this region (Gehlen *et al.* 2002; Riemer 2003). If 'the 5300 cal. B.C. exodus event' in Djara (Kindermann 2004: 39) did actually take place, these tools would probably have come to the Fayum at the onset of the depopulation of the Western Desert and hence, it is likely that they are dated to the second half of the 6th millennium cal. B.C. Alternatively, it is possible that these tools had already been dispersed into the Fayum without delay around 5800-5400 cal. B.C..

As for tanged arrowheads (24) and leaf-shaped arrowheads (25), Caton-Thompson could not make clear their date. Such arrowheads have only been found in relatively small quantities within stratigraphic levels of the Merimde Neolithic (Eiwanger 1984; 1988; 1992) as well as in the Maadi Predynastic (Rizkana & Seeher 1988). In the Fayum, these classes of arrowheads are quite abundant at such sites as Site V, Camp II and the Z Basin slopes, but are extremely rare at Kom K and Kom W (Caton-Thompson & Gardner 1934: 22, 75-79 & pl. LI). The Fayum tanged arrowheads and leaf-shaped arrowheads are unifacially or bifacially retouched and are fairly similar not only to those from Djara, Lobo, Farafra Oasis, Dakhleh Oasis and their vicinities, which are well dated (Barich & Hassan 1987: fig. 15 & 17; Barich & Lucarini 2002: fig. 7; Barich & Lucarini 2005: fig. 8; Barich *et al.* 1996: fig. 2; Kindermann 2004: fig. 11; Klees 1989: fig. 2 & 4; Kuper 1996: fig. 3; McDonald 1991: fig. 3; McDonald 1996: fig. 2; Riemer 2003: fig. 8; Riemer 2007a: fig. 9), but also to those from Siwa and Kharga Oases that are less well dated (Caton-Thompson 1952: pl. 100; Hassan & Gross 1987: fig. 5.4). Most of these Western Desert examples surely fall in the first half of the 6th millennium cal. B.C. and some may be dated back to the late 7th millennium cal. B.C. In addition, the tanged arrowheads and leaf-shaped arrowheads, similar to the Fayum examples, are well-known in the Pottery Neolithic Culture of the southern Levant during the late 7th-early 6th millennia cal. B.C. (Gopher 1994: 41). It is also acknowledged that the production of bifacially-retouched tanged arrowheads started in Cyrenaica, represented at the site of Haua Fteah during the first half of the 6th millennium cal. B.C., although it is not certain whether it derived from Egypt or the Maghreb (McBurney 1967: 295*ff*). It has recently been proposed that unifacially/bifacially retouched, tanged or leaf-shaped small arrowheads found in the northern half of the Egyptian Western Desert during the late 7th-early 6th millennia cal. B.C. should collectively be referred to as the '(bi) facial techno-complex' (Riemer 2007a; 2007b); however, the appearance of these arrowheads was actually a quite widespread phenomenon from the southern Levant to North Africa along the Mediterranean coast during the late 7th-early 6th millennia cal. B.C. Therefore, it is strongly suggested that most of the tanged arrowheads (24) and leaf-shaped arrowheads (25) in the Fayum can be attributed to either the latter half of the Qarunian, or more likely, the transitional period between the Qarunian and the Fayumian.

Caton-Thompson suggested that the pebble-butted points/knives (17) and pebble-backed knives/scrapers (18) were made on rounded and weathered flat pebbles, representing the most various and numerous of classes, but it is not certain whether they actually existed in the Qarunian. Some tools in these classes seem to be identical to Tixier's Type 15 & 106 and thus, it is no wonder that they existed in the Qarunian. However, tools of these classes are not well known in other Epipalaeolithic assemblages of the 9th-7th millennia cal. B.C. in Egypt. Some pebble-butted/backed knives or scrapers seen in Siwa Oasis (Hassan & Gross 1987: fig. 5.2-i & fig. 5.3-c) are similar to the Fayum examples and seem to be dated to the Early-Middle Holocene. Moreover, pebble-butted/backed knives and scrapers are numerous in the earliest level (*Urschicht*) of Merimde Beni Salama, which would probably be dated to the early-middle 6th millennium cal. B.C.; however, they decreased in later levels (*Schichten II-V*), which were dated to the first half of the 5th millennium cal. B.C. (Eiwanger 1984; 1988; 1992). Therefore, it may be said that these tool classes do not belong to the 'typical' Early Holocene North African technological tradition,

but rather appear in the northern half of the Egyptian Western Desert during the Early-Middle Holocene.

Apparently the Neolithic tool classes such as the concave-based arrowheads (13) may have appeared earlier. It has been suggested that the first appearance of concave-based arrowheads in Dakhleh Oasis can be attributed to the Bashendi; a period that is dated to the late 7th-early 6th millennia cal. B.C. and hence, contemporaneous with the transitional period between the Qarunian and the Fayumian. A supposedly primitive form of the concave-based arrowheads in Dakhleh Oasis has no pointed barbs, but square-ended barbs (McDonald 1991: fig. 3-a). It is no wonder that such a primitive form of this tool class already appeared in the Fayum during the transitional period between the Qarunian and the Fayumian. Indeed, such concave-based arrowheads have been found among Caton-Thompson's B group assemblages at Site G and Site H in the Fayum (Caton-Thompson & Gardner 1934: 62, 67 & pl. L), although she suggested that these concave-based arrowheads might be stray items (Caton-Thompson & Gardner 1934: 21). In addition, Caton-Thompson found concave-based arrowheads along with backed blades in an excavated context at Site Z and considered them to be attributable to the intermediate A-B group (Caton-Thompson & Gardner 1934: 59-60). It is possible that even in the Fayum, concave-based arrowheads appeared prior to the Fayumian.

There is no doubt that concave-based arrowheads quickly evolved and flourished during the Fayumian. Without any chronological considerations, it has been said that there was a virtually infinite variety of concave-based arrowheads in the Fayum (Holmes 1989: 416). However, the Neolithic lithic assemblages found in a stratigraphic context at Merimde Beni Salama show that concave-based arrowheads with square-ended barbs appeared first and predominated in earlier levels (*Schichten II-IV*), whereas concave-based arrowheads with pointed barbs appeared only in later levels (*Schichten IV-V*) (Eiwanger 1983: 64-65; 1992: 44-45, pl. 50 & 51). Given this observation, it is probable that the appearance of concave-based arrowheads with pointed barbs in the Fayum was also later in date during the Fayumian.

Although in very general terms, a comparison with other tool assemblages outside the Fayum suggests that a number of the Fayum prehistoric tool classes may be dated to the period that is believed to represent a hiatus in human habitation during the first half of the 6th millennium cal. B.C. A very tentative chronological reconsideration of the prehistoric tool classes is summarised in **Table 2**. It must be kept in mind that this tool-class-based chronology still contains many ambiguities. A continuing problem is how to prove this suggestion within the Fayum context itself. This hiatus was originally proposed some time ago based on a limited number of radiocarbon dates and controversial interpretations of the lake's recession (Hassan 1986; Kozlowski & Ginter 1993; Wendorf & Schild 1976), as well as insufficient understanding and inadequate comparative studies of Fayum lithic assemblages (Wenke & Casini 1989; Wenke *et al*. 1988). It is possible that new artefacts and radiocarbon dates are obtained from well-preserved, stratified sites within the Fayum, by future archaeological projects, and that they will fill this hiatus, thereby substantiating the gradual transition from the Epipalaeolithic to Neolithic cultures without a considerable break. A re-examination of lake level fluctuations during the periods in question is also needed in order to indicate whether the Fayum was physically inhabitable during this Transitional Period. The present lack of data on the lake level for this Transitional Period does not necessarily mean that the lake dried up and that people consequently abandoned the Fayum.

Some Considerations on Unclassified Tools in the Allard Pierson Collection

Apart from tools that can be classified following Caton-Thompson's terminology, there are some items in the Allard Pierson Collection that cannot be well described using her terminology.

One pointed bladelet from Khashmet ed-Dib (no. 4224 in **fig. 2**) is undeniably different from typical bladelets of the Epipalaeolithic Period. It is made on a thin bladelet that has several scars from a previous knapping sequence on the dorsal face and there is no backing retouch on the longer sides. One longer side and the upper half of another longer side of the bladelet are regularly and continuously retouched from the ventral to dorsal face, while forming a very acute angle with the ventral face, creating a pointed edge on the distal end. This may be called a partly-retouched leaf-shaped point, but it is absolutely distinct from the partly-retouched leaf-shaped points defined by Caton-Thompson, in that her partly-retouched leaf-shaped points are made on larger and thicker cortical blanks. This interesting pointed bladelet seems to be something between the typical bladelets of the Qarunian and bifacially-retouched, leaf-shaped arrowheads of later periods in terms of tool making technique and therefore may probably be dated to later than the Epipalaeolithic Period.

A small number of the bifacially-retouched oval items, of approximately 6-8cm long and 3-4cm wide (nos. 4161, 4174 & 4187 in **fig. 6**), are described as 'celtiforms' by Caton-Thompson, but actually look like 'preforms' in the early stages of the production of a more refined tool, similar to the leaf-shaped points and celtiforms. It seems that major irregularities on the surfaces of the blanks such as cortex, hinges and steps were almost removed with large scars, which run across the faces to the middle; however, short flakes at the edges have yet to be removed. Similar examples have been found in lithic assemblages of the early-middle 6th millennium cal. B.C. from Kharga, Dakhleh and Farafra Oases (Barich & Hassan 1987: fig. 18-1; Caton-Thompson 1952: pl. 102-104; McDonald 1991: fig. 3-k) and described as 'axe' or simply 'bifacial item,' though their possible function has not convincingly been demonstrated nor mentioned at all. It is certainly impossible to discuss the function of such enigmatic bifacial items without microwear studies. Nonetheless, it is significant to consider a possibility that they were not only a compact and economical form for transport, but also a versatile form that could be used as they were, or could easily be refined to produce a finished bifacial tool of different forms depending on the situation in which toolmakers encountered on the move.

Some Notes on the Post-Neolithic Tools in the Allard Pierson Collection

As mentioned above, several tools in the Allard Pierson Collection can be dated to post-Neolithic periods. Post-Neolithic tools are beyond the major concern of the author, but they deserve brief description.

Although not dated by Caton-Thompson on her original list of objects given to the Allard Pierson Museum, two flake scrapers (nos. 4167 & 4168 in **fig. 10**) can probably be dated to the Predynastic-Old Kingdom periods, because very similar examples have been repeatedly found at Old Kingdom sites in the Fayum and hence, Caton-Thompson recognised that they were a distinct

tool class that might have originated from the Predynastic Period (Caton-Thompson & Gardner 1934: 126-127, pl. LVII & LXXX).
Several blades (nos. 4169, 4175, 4207 & 4208 in **fig. 10**) might also probably be dated to the Predynastic or Old Kingdom periods, based on the comparison with a Predynastic assemblage recovered from Qasr Qarun on the southern shore of Lake Qarun (Caton-Thompson & Gardner 1934: pl. LII & LIII; Wenke & Brewer 1992: fig. 3) and Old Kingdom assemblages elsewhere in the Fayum (Caton-Thompson & Gardner 1934: pl. LIV, LV & LXXXI). Caton-Thompson roughly dated the Qasr Qarun assemblage to the Predynastic based on similarities to finds from a Predynastic site at Maadi (Caton-Thompson & Gardner 1934: 69*ff*) and indeed, similar examples of two blades (nos. 4207 & 4208) are abundantly seen in the report of the Maadi lithic artefacts (Rizkana & Seeher 1988: pl. 28-30). It has recently been argued on the basis of considerable differences in pottery vessels between the Fayum Predynastic and the Maadi Culture that the Fayum Predynastic might rather belong to the Naqada Culture of Upper Egypt (Rizkana & Seeher 1987: 61). However, as far as lithic artefacts are concerned, the Fayum types seem to exhibit stylistic elements that are presently recognised as Predynastic in assemblages elsewhere in Egypt (Holmes 1989) and it would suffice to say that they may be dated to the first half of the 4th millennium B.C. Two bifacially-retouched knives (nos. 4202 & 4205 in **fig. 11**) can be dated to the Old Kingdom, because similar examples have been found in the Old Kingdom assemblages of the Fayum (Caton-Thompson & Gardner 1934: 124*ff*, pl. LIV, LV & LXXIX).
According to a list of objects written by Caton-Thompson and given to the Allard Pierson Museum, hollow grinders (nos. 4211, 4212, 4213, 4214, 4215 & 4232 in **fig. 11**) were dated to the Middle Kingdom, but in *The Desert Fayum*, Caton-Thompson described these unique tools as 'dwarf crescent drills' and finally reached a conclusion that these tools should be dated to the Old Kingdom (Caton-Thompson & Gardner 1934: 131 and pl. LXIX). Similar crescent drills have been found around Qasr el-Sagha by different research teams, but have been dated to the Early Dynastic Period (Casini 1984: fig. 3) or the Middle Kingdom (Dagnan-Ginter *et al.* 1984: fig. 42) respectively; it is not certain as to which dating is correct. Similar crescent drills have also been found at a Predynastic settlement in Maadi (Rizkana & Seeher 1988: pl. 80-1) and at an Early Dynastic workshop in Buto (Schmidt 1988: fig. 11-2). Therefore, this type of tool may be roughly dated to between the Predynastic Period and the Middle Kingdom.

Provenance of Lithic Artefacts in the Allard Pierson Collection

As far as the Allard Pierson Collection is concerned, the sample size is too small to discuss the spatial distribution of the Fayum tool classes. Hence, it is hard to find concentrations of specific tool classes at specific sites and impossible to understand a lithic assemblage at a specific site during a specific period. For the same reason, it is not easy to argue the occupation length of specific sites. However, the list of finds for each site in *The Desert Fayum* indicates that even though the sample size is small, every single piece of the Allard Pierson Collection is certainly representative of the sites where it was found in terms of the supposed occupation period.

Eastern Cluster

1. Camp II and its vicinity

Caton-Thompson has reported huge quantities of prehistoric retouched tools (651 in total including both Epipalaeolithic and Neolithic tools) and some later (probably Predynastic and Old Kingdom) tools at the site of Camp II. She guessed that the abnormal quantities might be due to a number of reasons such as the site remaining unobserved and therefore un-plundered by local people; an unusually prolonged collecting by her; or, a real superabundance of tools concentrated in such a small area. Large quantities of small tanged or leaf-shaped arrowheads (230 in total) are also remarkable (Caton-Thompson & Gardner 1934: 76-77). The Allard Pierson Collection includes 25 tools from this site.

2. Site L (& Bench Mark L)

A total of 115 prehistoric and some later tools have been reported at Site L (Caton-Thompson & Gardner 1934: 73-74). The Allard Pierson Collection has only three of them.

3. Site V

A total of 185 prehistoric and some later tools have been reported at Site V. This site is close to Camp II and large quantities of small tanged or leaf-shaped arrowheads (62 in total) are remarkable for this site as well (Caton-Thompson & Gardner 1934: 75-76). The Allard Pierson Collection has one Old Kingdom knife and eight prehistoric tools from this site.

4. Khashmet ed-Dib

There is no description of this site in *The Desert Fayum*, its rough location being all that is known. According to Caton-Thompson's map, it appears that Khashmet ed-Dib is located around the edge of an escarpment that steeply falls to the present lakeshore and is close to a Greco-Roman site of Tell er-Rusas. Caton-Thompson has recorded several unnamed Epipalaeolithic sites around this area and it is probable that she called this entire area Khashmet ed-Dib. If the prehistoric find-spot of Khashmet ed-Dib is located around the edge of the escarpment, its elevation is approximately 0 m asl and hence, is the lowest elevation among all prehistoric sites in the Fayum. Four backed bladelets from this site in the Allard Pierson Collection can undoubtedly be dated to the Epipalaeolithic, but one bladelet (no. 4224 in **fig. 2**), whose cutting edges are continuously well-retouched from the ventral to dorsal face, and one pebble-butted point/knife (no. 4148 in **fig. 5**) do not look like typical Epipalaeolithic items. The location and elevation of the site also strongly suggests that all of the tools could be dated to the Epipalaeolithic and Transitional periods.

5. Site X

A total of 111 Neolithic tools are reported in *The Desert Fayum* (Caton-Thompson & Gardner 1934: 74-75), but the Allard Pierson Collection has only one piece from this site.

6. Site Z (& Z Basin)

According to Caton-Thompson, Site Z had been ruthlessly plundered, but nonetheless, 84 Neolithic tools were collected. The Z Basin slopes to the south of Site Z were also surveyed and 79 prehistoric tools with some Old Kingdom artefacts were collected on the surface (Caton-Thompson & Gardner 1934: 77-79). The Allard Pierson Collection has seven pieces from this area.

Western Cluster

1. Dimai

The Dimai area is broadly subdivided into four districts; the West Dimai Basin, the Dimai Irrigation Dyke area, the D3 Wadi and the Southern area. There were 83 tools collected from the West Dimai Basin, 18 from the Dimai Irrigation Dyke area, 52 from the D3 Wadi and seven from the Southern area (Caton-Thompson & Gardner 1934: 85-86). The Allard Pierson Collection has five tools from somewhere in the Dimai area and one of them is a core that has not been mentioned in the report.

2. N Basin south

It has been reported that Old Kingdom artefacts were fairly abundant in the N Basin south (Caton-Thompson & Gardner 1934: 86). But only one Old Kingdom knife from the N Basin south is included in the Allard Pierson Collection.

3. Qasr el-Sagha

It has been reported that the foot of the Qasr el-Sagha scarp was littered with lithic artefacts and that Old Kingdom hollow grinders were particularly abundant (Caton-Thompson & Gardner 1934: 81). The Allard Pierson Collection has six pieces from this site, but five of the six pieces are small hollow grinders. One concave-based arrowhead is undoubtedly dated to the Neolithic.

4. Site N

Site N was the richest in Neolithic artefacts in the western cluster of sites with 175 tools collected (Caton-Thompson & Gardner 1934: 84-85). Five of them are included in the Allard Pierson Collection.

5. Site O (& Area T-O)

Few Neolithic tools were collected at Site O and the Area T-O. Caton-Thompson mentioned that this would be due to taphonomic processes or unusually thorough collecting by antiquarians (Caton-Thompson & Gardner 1934: 83-84). The Allard Pierson Collection has two concave-based arrowheads from this area and they are undoubtedly dated to the Neolithic Period.

6. Site R

A total of 34 tools of the Neolithic were collected at this site (Caton-Thompson & Gardner 1934: 81-82) and the Allard Pierson Collection has two of them. One knife blade from this site in the Allard Pierson Collection can be dated to the Old Kingdom.

7. Site S

A total of 47 Neolithic tools and some Old Kingdom tools have been collected at Site S (Caton-Thompson & Gardner 1934: 82). The Allard Pierson Collection has three of the 47 Neolithic tools.

8. Site T

A total of 37 Neolithic tools and some Old Kingdom tools have been collected at Site T (Caton-Thompson & Gardner 1934: 82-83). The Allard Pierson Collection has three artefacts from this site, but one is a core that was not mentioned in *The Desert Fayum*.

Lithic Raw Materials

Almost all Fayum prehistoric tools are made of medium to fine-grained flint of different colours from light to dark brown. Only one example of Neolithic polished axes (no. 4139 in **fig. 7**) is made of a basalt cobble. The source of basalt is undoubtedly the northern ridge of the Fayum Depression, which is capped by thick layers of basalt.

Except for a polished axe and pebble-butted/pebble-backed tools, there are few clues in the Allard Pierson Collection as to what forms of flint, like nodules or cobbles, were exploited. For the polished axe (no. 4140 in **fig. 7**), a naturally rounded flint cobble of approximately 9cm long, 5cm wide and 3cm thick was used and one end of the cobble was ground and polished from both faces, forming a flat cutting edge. For planes (nos. 4142, 4181 & 4182 in **fig. 3**), pebble-butted points/knives (nos. 4179, 4180, 4152 & 4150 in **fig. 4**, & nos. 4149, 4176 & 4148 in **fig. 5**) and pebble-backed knives/scrapers (nos. 4177, 4151 & 4153 in **fig. 5**, & nos. 4154 & 4183 in **fig. 6**), there is no doubt that subangular or oval, weathered cobbles of more than 9cm long, 3cm wide, and 3cm thick, were commonly used. It may be assumed that cobbles of this size class were also used for making bifacially-retouched tools of smaller sizes. As for larger knives of more than 10cm long (nos. 4207 in **fig. 10** & 4202 in **fig. 11**), it seems likely that nodular or tabular flint was used.

It has been mentioned that the Upper Eocene-Lower Oligocene Formation, which consists of hard limestone with beds of flint, on top of the scarp directly above Qasr el-Sagha, is the only area in the Fayum where flint occurs in a primary geological position (Cagle 1994). However, it must have been possible and easy for prehistoric people to exploit secondary deposits of flint, which would have eroded out from the upland surface and scarp, transporting downslope to the streambed. The presence of such secondary deposits or extensive surface scatters of flint nodules or cobbles that were suitable for tool making has not been reported in the prehistoric habitat of the Fayum.

It was recognised that some tools (nos. 4180 in **fig. 4**, 4148 in **fig. 5** & 4174 in **fig. 6**) were heavily patinated, but had relatively fresh retouch on their edges. These examples suggest that discarded tools that had been exposed on the desert surface were occasionally picked up and reused by re-sharpening the edges.

Some Remarks on Toolmaking Technique

Epipalaeolithic tools

Epipalaeolithic tools are predominated by backed bladelets. Several bladelets (nos. 4189, 4221, 4222 & 4223 in **fig. 2**) suggest that they derived from unfacetted single platform cores. It has been known that Fayum Epipalaeolithic backed bladelets included a variety of types, but backed bladelets in the Allard Pierson Collection, most of which derived from Camp II and Khashmet ed-Dib, do not include arch-backed ones. Most of them are straight-backed and pointed, including double-pointed and double-backed varieties. Backing retouch is obverse or *sur enclume*. Trihedral rods are apparently a variant of double-backed bladelets. Both sides of a bladelet are continuously retouched from the ventral to dorsal face at an angle of more than 45 degrees, forming a triangular or trapezoidal section and the ventral face is also retouched.

Transitional tools

Pebble-butted points/knives and pebble-backed knives/scrapers are the most conspicuous tools during the Transitional Period. There are some clues as to how they were made. Two pebble-backed knives/scrapers (nos. 4154 & 4183 in **fig. 6**) suggest that an elongated pebble was wedged by a hard blow, as indicated by an odd compression fracture at the point of impact on the ventral face and an oval or elongated primary flake with almost 100 % cortex on the dorsal face was removed. One longer side of the primary flake was continuously and regularly retouched from the ventral to dorsal face, forming an angle of less than 90 degrees with the ventral face. Likewise, one plane (no. 4181 in **fig. 3**) suggests that a primary flake was struck off by hard hammer percussion on a cortical platform of a weathered cobble and that all sides of the flake were continuously retouched from the ventral to dorsal face.

Regarding the tanged and/or leaf-shaped arrowheads, it can be presumed that a basic technique for making pointed backed bladelets and trihedral rods of the Epipalaeolithic developed into the pressure flaking and bifacial thinning technique for making formal small arrowheads. Epipalaeolithic toolmakers had already a long period of experience in dealing with tiny pieces of flint and it seems that obverse or *sur enclume* retouching for backing bladelets was simply applied in a slightly different way to making arrowheads. It is interesting to note that the appearance of tanged and/or leaf-shaped arrowheads seem to have been almost concurrent with the decline of backed bladelets and trihedral rods.

Neolithic tools

Formal bifacial thinning and retouching is a feature of Neolithic lithic technology. Concave-based, tanged, leaf-shaped, or triangular arrowheads/spearheads are the most notable tool classes to which bifacial technology was applied. It seems that the sequence of making these bifacial tools was the next step forward from the making of pebble-butted/backed tools mentioned above. The fact that some small bifacial tools (no. 4160 in **fig. 3** & no. 4146 in **fig. 9**) have a cortex in the middle of one face suggests that primary flakes were used for making bifacial tools. It is supposed that the cortex on the dorsal face of an oval, thick primary flake was removed by soft hammer percussion from different directions and moreover, the ventral face was also covered by irregular scars and the flake was made thinner. The bifacial flake was then trimmed into a variety of formal tools. Marginal obverse retouch is continuous and regular.

Summary

A technological observation as well as a tentative chronological re-classification of the tool classes suggests that there is a diachronical continuum in the development of tool making technique, contrary to an early idea that there was a considerable technological hiatus between the Epipalaeolithic and Neolithic Periods. Although it is not yet certain whether the presence of a transitional period can be substantiated archaeologically, it seems more logical to assume such a period for the development of bifacial technology existed, rather than to argue that bifacial technology appeared suddenly out of nowhere in the Fayum during the Neolithic Period.

Microscopic Observation of the Tools

All tools were observed under stereo microscope and metallurgic microscope in order to see if there are microwear traces. Lithic microwear study is not common in Egyptian prehistoric archaeology, partly because it has been argued that use polish did not develop as readily on relatively medium- and coarse-grained Egyptian flint as on European fine-grained flint (Holmes 1987) and partly because it has been argued that high salinity in Egyptian soils could cause damage to the surface of porous Egyptian flint, obscuring microwear traces (Fojud & Kobusiewicz 1982). There are only some microwear studies, but all of them were the studies of Late Palaeolithic materials from Upper Egypt and Nubia, and few studies have been attempted on Epipalaeolithic and Neolithic materials. Therefore, it was expected that studying the Fayum material would be the first step towards an understanding of microwear traces on Epipalaeolithic and Neolithic tools. For the interpretation of microwear traces, experimental tools made of European flint including Rijckholt flint (the Netherlands) and Cap Blanc Nez flint (France), which are housed in the Laboratory of Artefact Studies in the Faculty of Archaeology in Leiden University were referred to, because it was difficult to obtain Egyptian flint for experimental use.

Since most of the objects were collected on the desert surface, it was assumed that they already suffered from sand blasting, water rolling and acidity or alkalinity of dew. Indeed, under a low-power stereo microscope, the surface of many tools is abraded and/or patinated and the edges are dull. Under high-power metallurgic microscope, quite similar patterns of polish, looking like so-called hide polish as well as striations were observed on worked edges of many tools, regardless of supposed different functions of the tools. For example, a serrated sickle blade (no. 4145 in **fig. 9**) and a concave-based arrowhead (no. 4217 in **fig. 8**) of the Neolithic Period have similar rough polish with perpendicular and transverse striations on their worked edges. Versatility of the tools must be taken into consideration, but it seems more reasonable to presume that much of the polish and striations were caused by post-depositional surface modification. In some cases, a number of tiny and sharp striations cover the entire surface of tools and cutting edges, with striations even upon the ink inscriptions on the tools. It is apparent that such striations were caused very recently when many tools were put into a bag and shaken during transportation. Even though some of the polish and striations may possibly indicate traces of use, it is very hard to judge the use of the tools based on such vague polish and striations without replication of similar pieces by experimentation.

Observations under stereo microscope revealed that the cutting edges of several tools had wear traces, which should be called microflaking and would probably have been caused by use contact with hard materials. Such wear traces look more obvious when the degree of wear on both faces of the cutting edges is compared. One face of a cutting edge is more severely worn than another and this may suggest which face of a cutting edge actually contacted the materials being worked on and at what angle and in what motion. In the case of two bladelets (nos. 4189 & 4222 in **fig. 2**), the ventral face of the cutting edge is more heavily worn than the dorsal

face. In the case of two planes (nos. 4141 & 4182 in **fig. 3**) and a celtiform (no. 4230 in **fig. 7**), the unretouched or less retouched face of the cutting edge is more heavily worn than another well-retouched face. In the case of pebble-butted points/knives and pebble-backed knives/scrapers (nos. 4152 in **fig. 4**, 4153 & 4177 in **fig. 5**, & 4183 in **fig. 6**), some have heavier wear traces on the unretouched face of a cutting edge than those on another well-retouched face. Others (nos.4149 in **fig. 5** & 4154 in **fig. 6**) have heavier wear traces on the well-retouched face of a cutting edge than those on another unretouched face. All of these examples suggest scraping or whittling motions and the suggested motions correspond to the tool function guessed purely on the basis of tool morphology. On the other hand, as for one retouched blade (no. 4208 in **fig. 10**), one face of a cutting edge is more heavily worn than another face, suggesting a whittling motion, but several visible striations and a number of microscopic striations on the cutting edge strongly suggest a sawing motion. Therefore, it is not easy to interpret the tool use based only on the microflaking of cutting edges. Again, it is necessary to consider a possibility that microflaking was also caused by post-depositional modification.

It was also notable under a low-power microscope that the preservation of many tools collected at Camp II was very good. The worked edges of the tools are still very sharp and not rounded, though slightly patinated. This fact may support Caton-Thompson's observation that lithic artefacts at Camp II seemed to have been eroded out from steep desert slopes and washed down to a basin floor very recently and hence, they were overlooked by artefact plunderers of the late 19th and early 20th centuries despite their ruthless activities in this area (Caton-Thompson & Gardner 1934: 77-78). In contrast, the preservation of most tools collected at sites in the western cluster was not good. The worked edges and even the entire surface of the tools are heavily abraded and patinated. This may suggest that these tools have been water-rolled by recurrent inundation of the area and then exposed on the desert surface for a long time.

Other features that were observed under a stereo microscope or visible to naked eye and might be considered clues as to the tool use, is the patchy distribution of enigmatic black particles, blackish discolouration and uneven distribution of patina on the tool surface. The unserrated side of a sickle blade (no. 4145 in **fig. 9**) and the lower half of a backed bladelet (no. 4172 in **fig. 2**) are covered by black particles, which may be traces of glue for hafting. A leaf-shaped point (no. 4158 in **fig. 3**) has a section of blackish discolouration on the proximal end, which may also be a trace of glue for hafting. The upper half of a backed bladelet (no. 4188 in **fig. 2**) and a leaf-shaped arrowhead (no. 4200 in **fig. 2**) is covered by patina, whereas the lower half is not patinated and retains sharp edges and ridges. A chisel (no. 4206 in **fig. 9**) has a strangely-shaped unpatinated area on one face and the proximal end of a retouched blade (no. 4207 in **fig. 10**) is not patinated, whereas almost the entire surface is covered by patina. These examples may probably suggest that the intact areas of the tools were originally covered by hafts and therefore escaped patination, although it is also probable that the difference in the extent of patination was caused by the condition of the deposition of the tools.

Final Remarks

Studying Caton-Thompson's Fayum collection in a museum is significant for an understanding of not only her scholarly attitude to her collection, but more interestingly, the lithic technology and use and its transition from the Epipalaeolithic to Neolithic. There must be more tools that were not published by Caton-Thompson, but can still provide clues that broaden our knowledge about the lithic assemblage, lithic technological organisation and its transition. Therefore, studying her forgotten collections in museums around the world is worthwhile. Microscopic observation of the tools was not successful because of the problem with tool preservation; however, it is a useful method when it is employed to tools that were obtained from the primary context by excavators. It is necessary to observe as many tools as possible in order to make a more reasonable interpretation of microwear traces. There is no doubt that excavating the museums around the world that house the Fayum lithic collections will shed more new light on the prehistory of the Fayum.

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Table 1. List of Fayum lithic artefacts housed in the Allard Pierson Museum.

figure	APM number	classification	possible date	provenance	raw material	weight (g)
2	4171	backed bladelet	Epipalaeolithic	Camp II basin	brown flint	0,64
2	4172	backed bladelet	Epipalaeolithic	Camp II	dark brown flint	0,97
2	4173	backed bladelet	Epipalaeolithic	Camp II	light brown flint	0,43
2	4225	backed bladelet	Epipalaeolithic	Camp II-Kom W	mottled brown flint	0,71
2	4170	backed bladelet	Epipalaeolithic	Camp II	dark brown flint	0,90
2	4227	backed bladelet	Epipalaeolithic	Site V	light brown flint	3,11
2	4189	backed bladelet	Epipalaeolithic	Khashmet ed-Dib	dark brown flint	1,04
2	4220	backed bladelet	Epipalaeolithic	Khashmet ed-Dib	light brown flint	3,07
2	4221	backed bladelet	Epipalaeolithic	Khashmet ed-Dib	dark brown flint	2,12
2	4222	backed bladelet	Epipalaeolithic	Khashmet ed-Dib	brown flint	1,39
2	4223	backed bladelet	Epipalaeolithic	Khashmet ed-Dib	dark brown flint	3,93
2	4226	backed blade	Epipalaeolithic	Site V	light brown flint	4,56
2	4188	backed blade	Epipalaeolithic	Z basin	brown flint	2,82
2	4224	bladelet	Epipalaeolithic	Khashmet ed-Dib	dark brown flint	2,58
2	4178	blade	Epipalaeolithic?	Site T	light brown flint	2,48
2	4184	trihedral rod	Epipalaeolithic	Camp II basin-se	dark brown flint	2,94
2	4185	trihedral rod	Epipalaeolithic	Camp II basin-se	brown flint	2,54
12	4209	multiple platform core	Epipalaeolithic?	Site Z	light brown flint	-
13	4210	multiple platform core	Epipalaeolithic?	Site T	light brown flint	-
14	4228	multiple platform core	Epipalaeolithic?	Dimai-w.basin	light brown flint	-
2	4194	tanged arrowhead	Transitional	Camp II basin	light brown flint	0,38
2	4193	tanged arrowhead	Transitional	Camp II	light brown flint	0,48
2	4197	tanged arrowhead	Transitional	Camp II basin	light brown flint	1,07
2	4196	tanged arrowhead	Transitional	Dimai	light brown flint	0,67
2	4195	leaf-shaped arrowhead	Transitional	Camp II basin	light brown flint	0,40
2	4201	leaf-shaped arrowhead	Transitional	Camp II	brown flint	3,00
2	4200	leaf-shaped arrowhead	Transitional	Camp II	brown flint	4,21
3	4141	gouge	Transitional?	Site V-Camp II	mottled brown flint	42,32
3	4182	plane	Transitional	Site V	brown flint	35,46
3	4181	plane	Transitional	Dimai-nw	brown flint	24,78
3	4142	plane	Transitional	Site N	brown flint	26,15
3	4158	leaf-shaped point	Transitional	Bench Mark L	brown flint	24,52
3	4186	leaf-shaped point	Transitional	Site V	light brown flint	18,80
3	4160	leaf-shaped point	Transitional	Site S	brown flint	8,99
4	4159	partially retouched, leaf-shaped point	Transitional	Camp II	light brown flint	20,69
4	4165	partially retouched, leaf-shaped point	Transitional	Camp II	light brown flint	9,55
4	4179	pebble-butted point/knife	Transitional	Camp II-Kom W	brown flint	39,88
4	4180	pebble-butted point/knife	Transitional	Camp II-Kom W	beige flint	23,46
4	4152	pebble-butted point/knife	Transitional	Khashmet ed-Dib	brown flint	17,94
4	4150	pebble-butted point/knife	Transitional	Site T	dark brown flint	18,32
5	4149	pebble-butted point/knife	Transitional	Site X	brown flint	34,51
5	4177	pebble-backed knife/ scraper	Transitional	Dimai	mottled brown flint	13,65
5	4176	pebble-butted point/knife	Transitional	Site N	beige flint	46,58
5	4148	pebble-butted point/knife	Transitional	Khashmet ed-Dib	brown flint	45,42
5	4151	pebble-backed knife/ scraper	Transitional	Site S	dark brown flint	26,37
5	4153	pebble-backed knife/ scraper	Transitional	Site L	brown flint	16,31

6	4154	pebble-backed knife/ scraper	Transitional	Site V	light brown flint	16,74
6	4183	pebble-backed knife/ scraper	Transitional	Site Z	brown flint	14,05
6	4166	side-blow flake	Transitional	Site R	light brown flint	24,46
6	4187	celtiform?	Transitional	Site Z	dark brown flint	23,30
6	4161	celtiform?	Transitional?	Site S	dark brown flint	43,39
6	4174	celtiform?	Transitional?	Site Nb	brown flint	37,35
7	4230	celtiform	Transitional	unknown	light brown flint	44,22
7	4229	celtiform	Transitional	Site Z	light brown flint	37,06
7	4140	ground and polished axe	Neolithic	Site L	dark brown flint	168,25
7	4139	ground and polished axe	Neolithic	Site N	basalt	89,00
7	4163	triangular, or slightly hollow-based arrowhead	Neolithic	Camp II	dark brown flint	12,31
7	4162	triangular, or slightly hollow-based arrowhead	Neolithic	Dimai-w	dark brown flint	8,84
7	4164	triangular, or slightly hollow-based arrowhead	Neolithic	unknown	dark brown flint	11,16
8	4191	concave-based arrowhead	Neolithic	Camp II	dark brown flint	3,22
8	4190	concave-based arrowhead	Neolithic	Camp II	mottled brown flint	4,64
8	4231	concave-based arrowhead	Neolithic	unknown	dark brown flint	5,03
8	4217	concave-based arrowhead	Neolithic	Area T-O	light brown flint	6,45
8	4219	concave-based arrowhead	Neolithic	Qasr el-Sagha	dark brown flint	8,71
8	4218	concave-based arrowhead	Neolithic	Site T	dark brown flint	9,85
8	4216	concave-based arrowhead	Neolithic	Site O	dark brown flint	10,38
9	4156	knife blade	Neolithic	Site R	brown flint	39,47
9	4204	knife blade	Neolithic	Site Z	dark brown flint	36,12
9	4206	chisel	Neolithic	Site N	dark brown flint	23,79
9	4143	sickle blade	Neolithic	Camp II basin	brown flint	20,28
9	4144	sickle blade	Neolithic	Camp II	mottled brown flint	11,50
9	4145	sickle blade	Neolithic	Camp II	mottled brown flint	11,55
9	4146	sickle blade	Neolithic	Site N	brown flint	9,77
10	4167	scraper	Predynastic-Old Kingdom	Site V-w	dark brown flint	14,33
10	4168	scraper	Predynastic-Old Kingdom	Site Nb	brown flint	20,65
10	4175	blade	Predynastic-Old Kingdom	Camp II-Kom W	light brown flint	7,69
10	4169	blade	Predynastic-Old Kingdom	Camp II-Kom W	beige flint	4,35
10	4208	retouched blade	Predynastic	Site Z	light brown flint	14,48
10	4207	retouched blade	Predynastic	Site V	light brown flint	37,15
15	4203	knife handle	Old Kingdom	Site V	light brown flint	-
11	4202	knife blade	Old Kingdom	N Basin-s	brown flint	41,89
11	4205	knife blade	Old Kingdom	Site R	brown flint	28,60
11	4211	hollow grinder	Old Kingdom	Qasr el-Sagha	brown flint	16,38
11	4212	hollow grinder	Old Kingdom	Qasr el-Sagha	brown flint	11,18
11	4213	hollow grinder	Old Kingdom	Qasr el-Sagha	dark brown flint	12,99
11	4214	hollow grinder	Old Kingdom	Qasr el-Sagha	brown flint	6,92
11	4215	hollow grinder	Old Kingdom	Qasr el-Sagha	brown flint	12,82
11	4232	hollow grinder	Old Kingdom	unknown	brown flint	13,43

Table 2. Chronological reconsideration of Caton-Thompson's Fayum tool classes.

	culture	Epipalaeolithic						transitional		Neolithic				
	cal.BC	8000			7000			6000			5000			4000
1	ground and polished axes													
2	polished and flaked axes													
3	flaked axes													
4	adzes													
5	gouges													
6	planes													
7	knife blades													
8	daggers, spears, or javelin heads													
9	halberds													
10	chisels													
11	ground points													
12	triangular or slightly hollow-based arrowheads													
13	concave-based arrowheads													
14	sickle blades													
15	leaf-shaped points													
16	partially retouched, leaf-shaped points													
17	pebble-butted points/knives													
18	pebble-backed knives/scrapers													
19	side-blow flakes													
20	celtiforms													
21	scrapers													
22	backed blades													
23	trihedral rods													
24	tanged arrowheads													
25	leaf-shaped arrowheads													

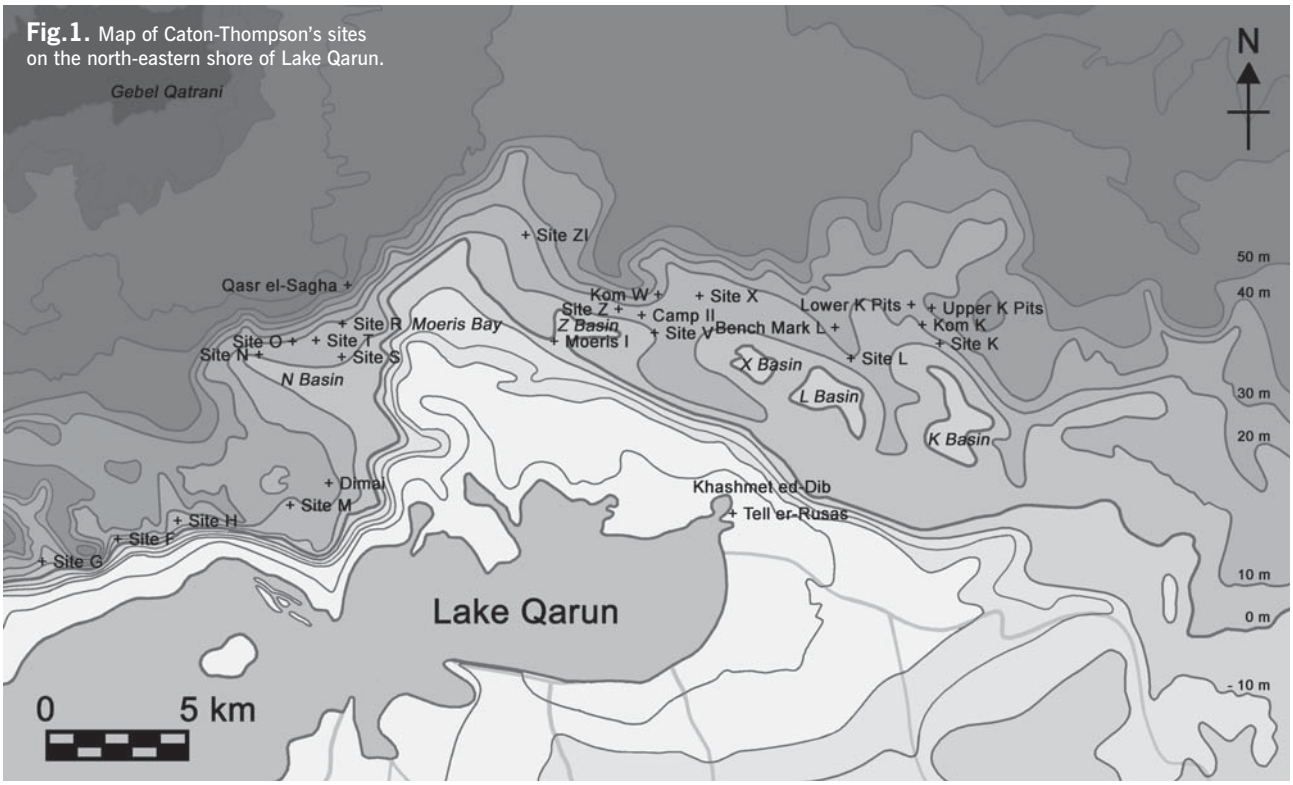

Fig.1. Map of Caton-Thompson's sites on the north-eastern shore of Lake Qarun.

Fig.2
Blades/bladelets, trihedral rods, tanged arrowheads and leaf-shaped arrowheads.

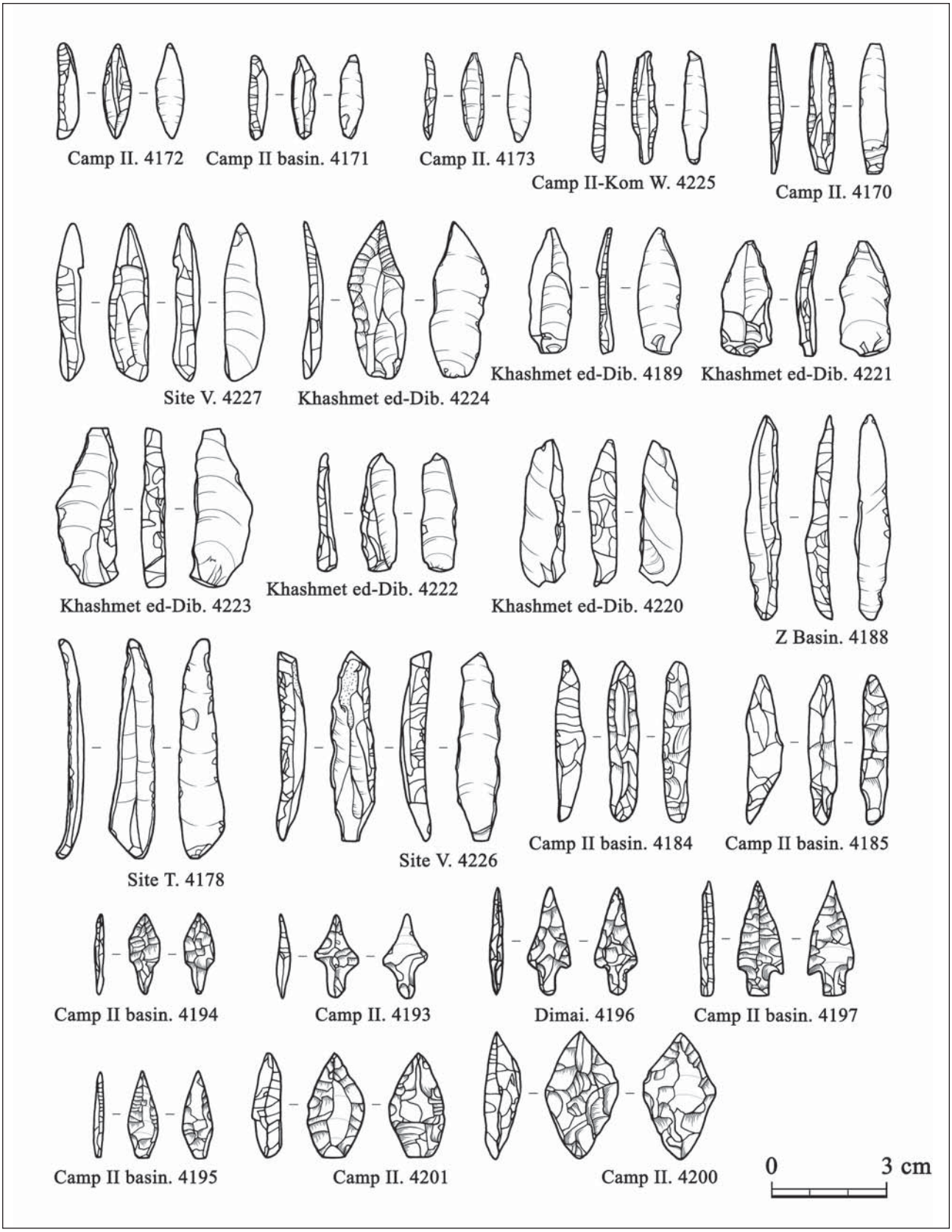

Fig.3
Gouge, planes and leaf-shaped points.

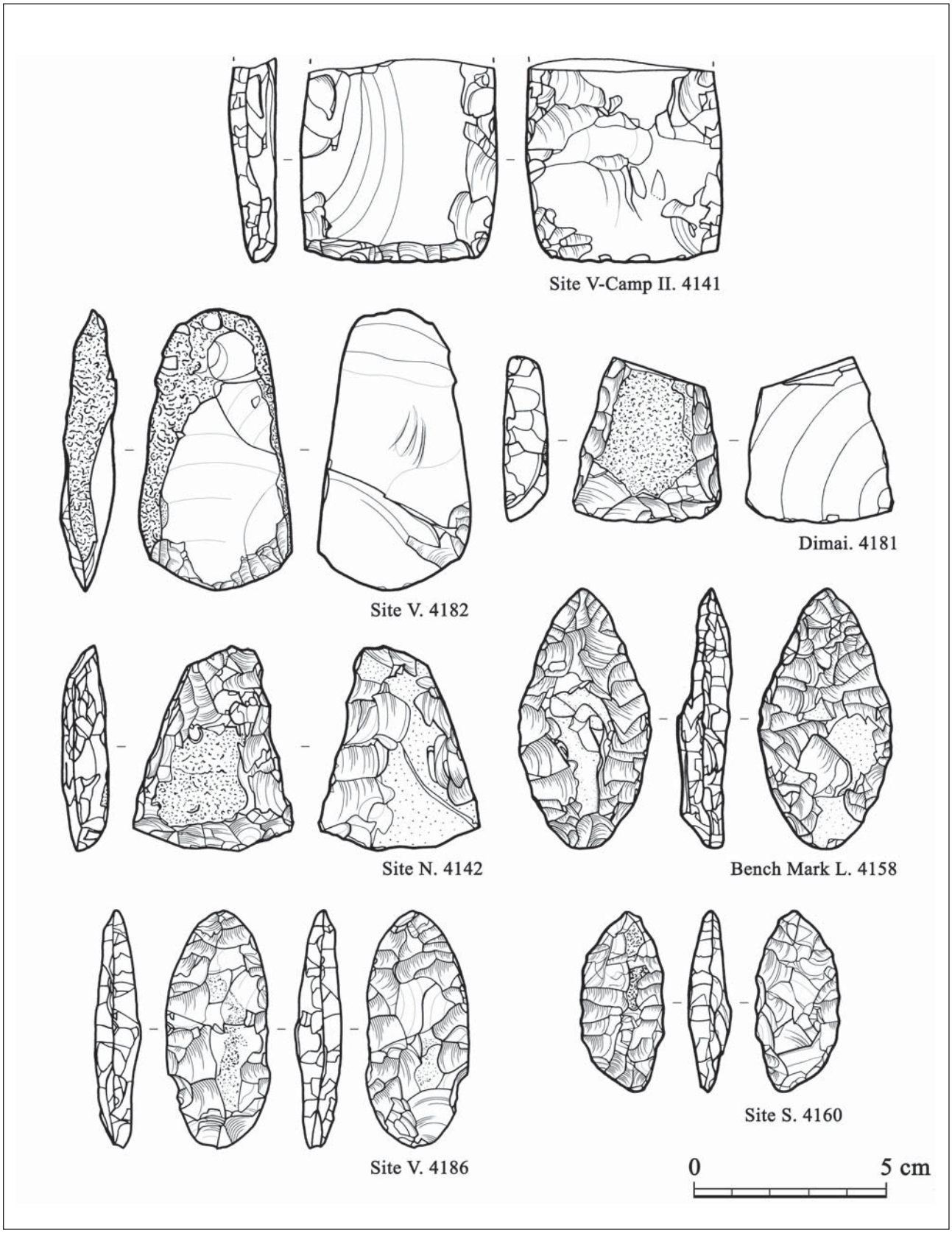

Fig.4
Partially retouched leaf-shaped points and pebble-butted points/knives.

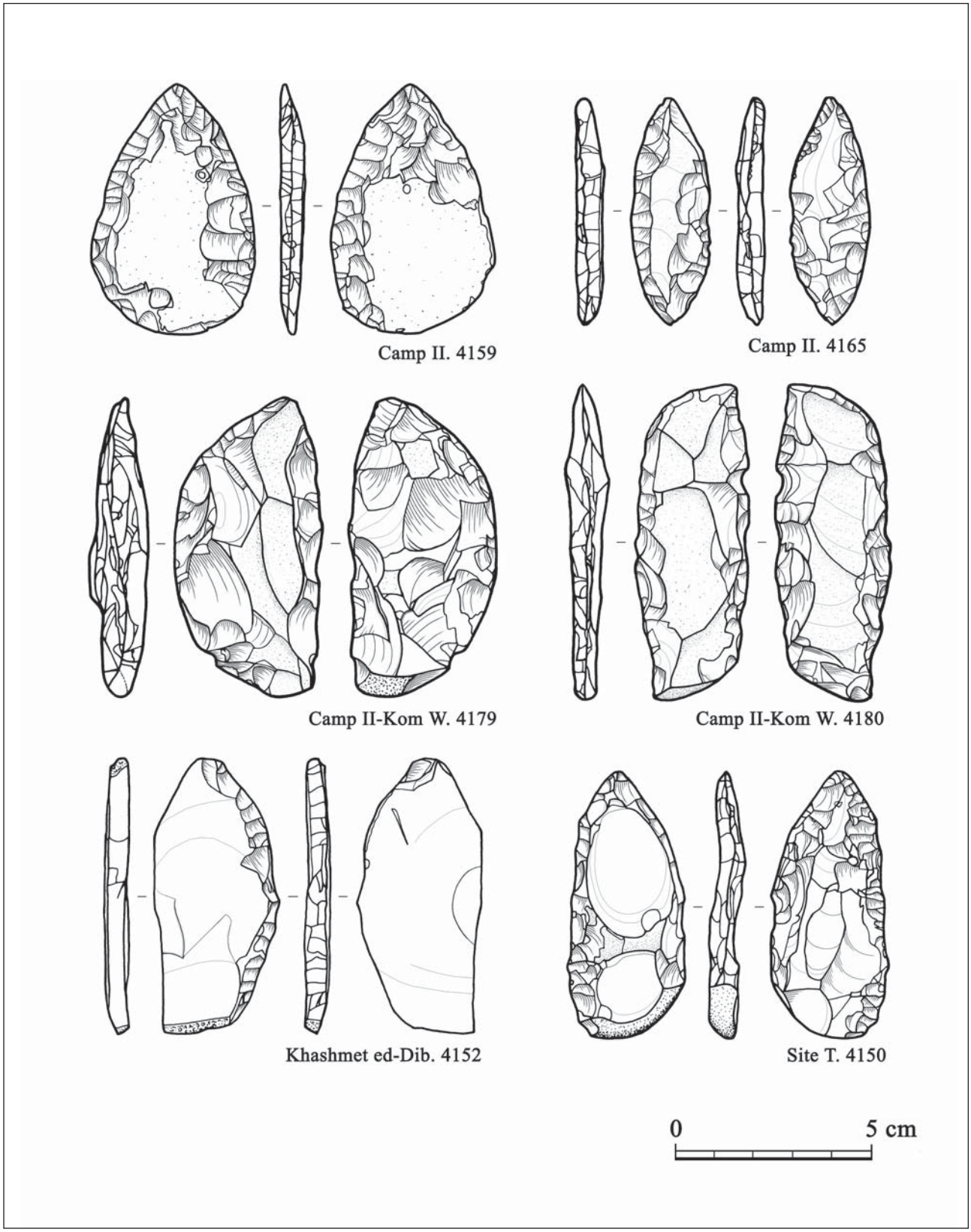

Fig.5
Pebble-butted points/knives and pebble-backed knife/scraper.

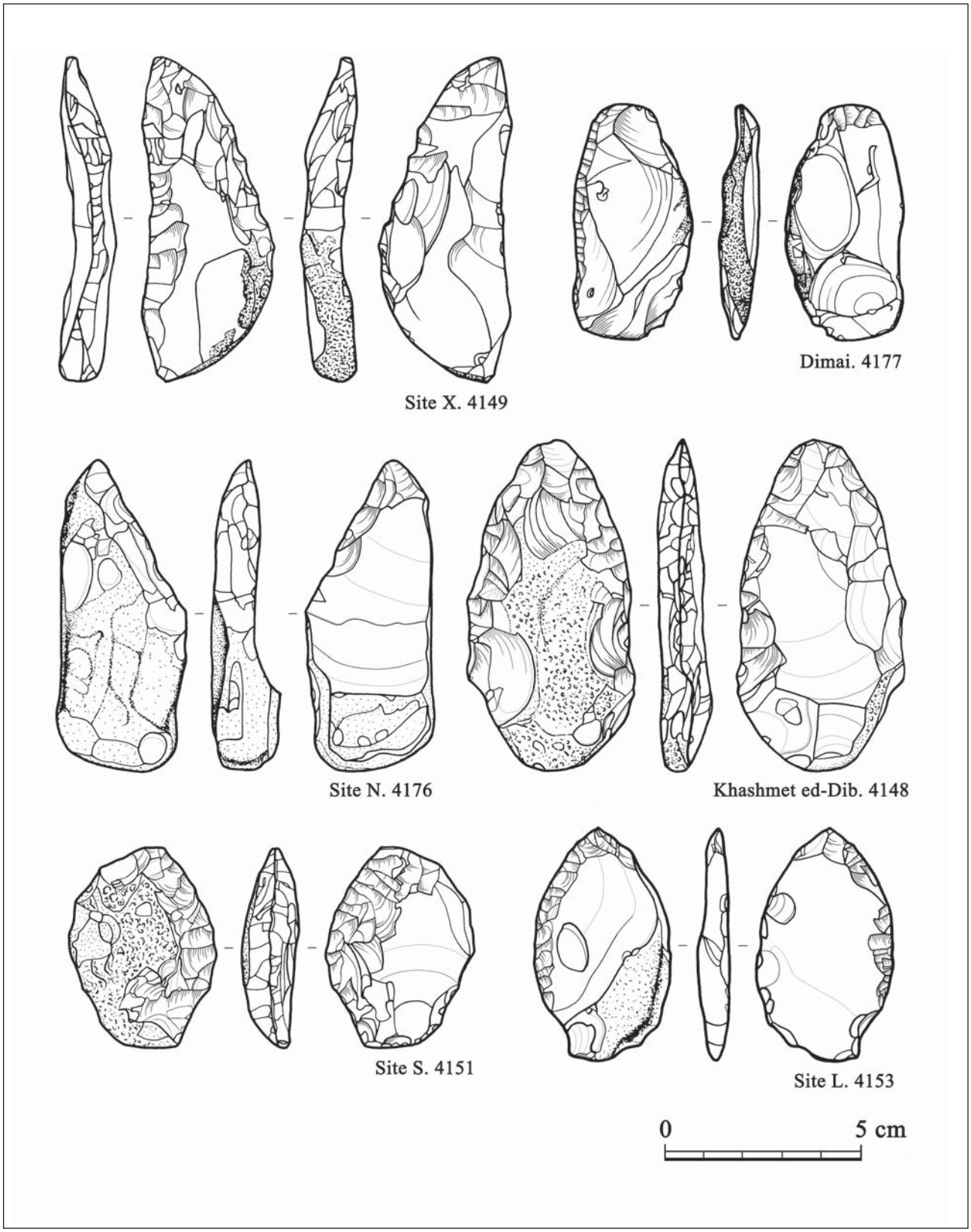

Fig.6
Pebble-backed knives/scrapers, side-blow flake and celtiforms.

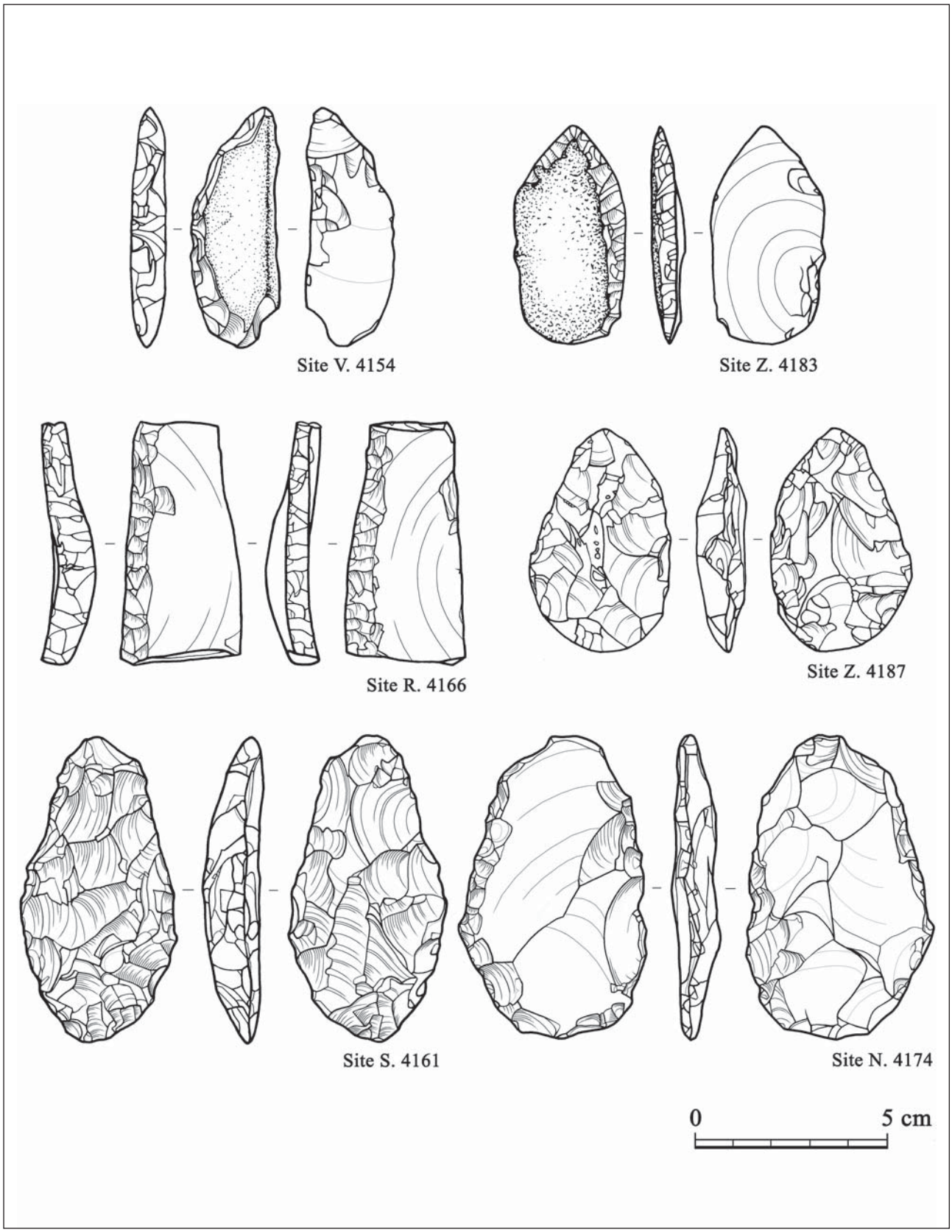

Fig.7

Celtiforms, ground and polished axes and triangular or slightly hollow-based arrowheads.

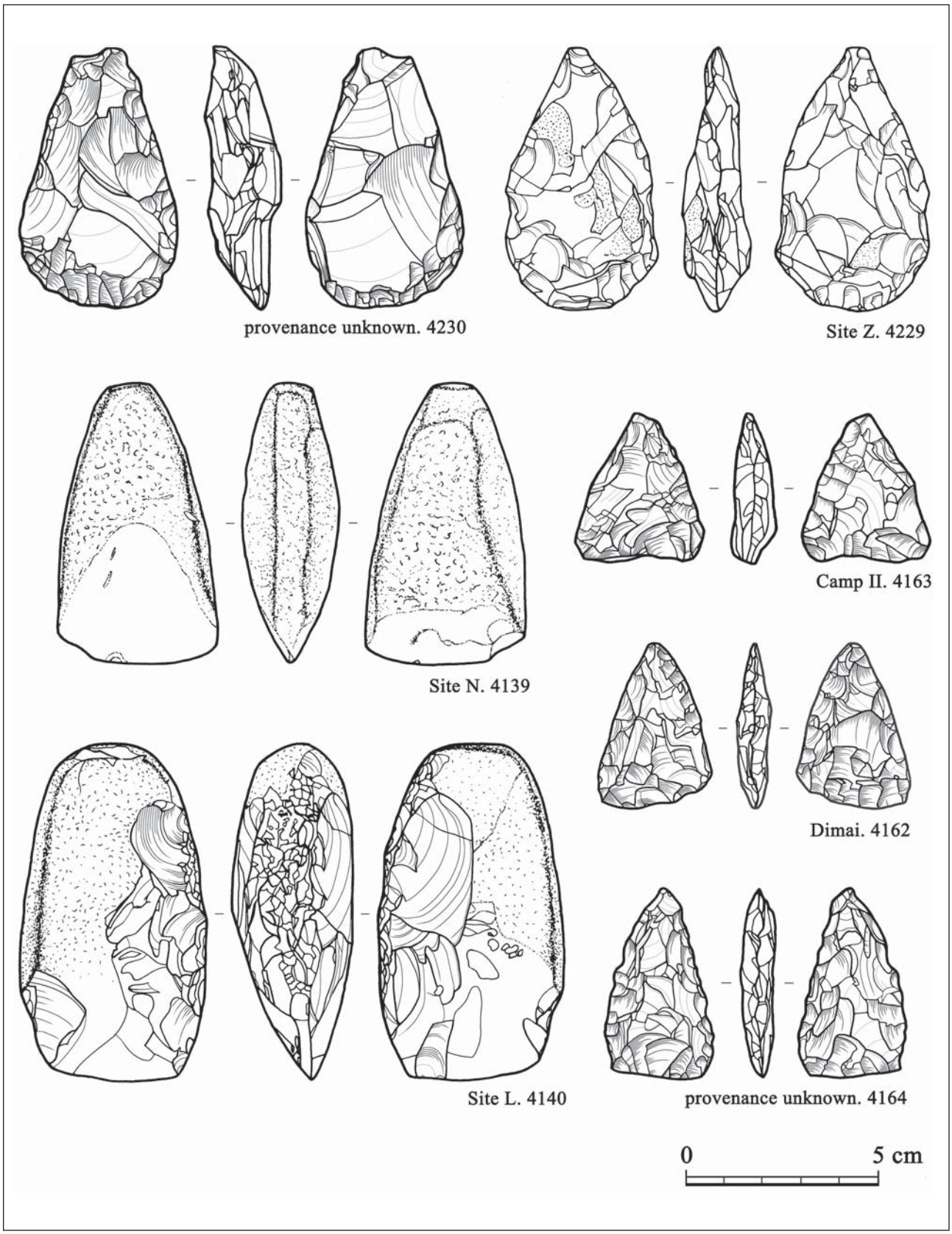

Fig.8
Concave-based arrowheads.

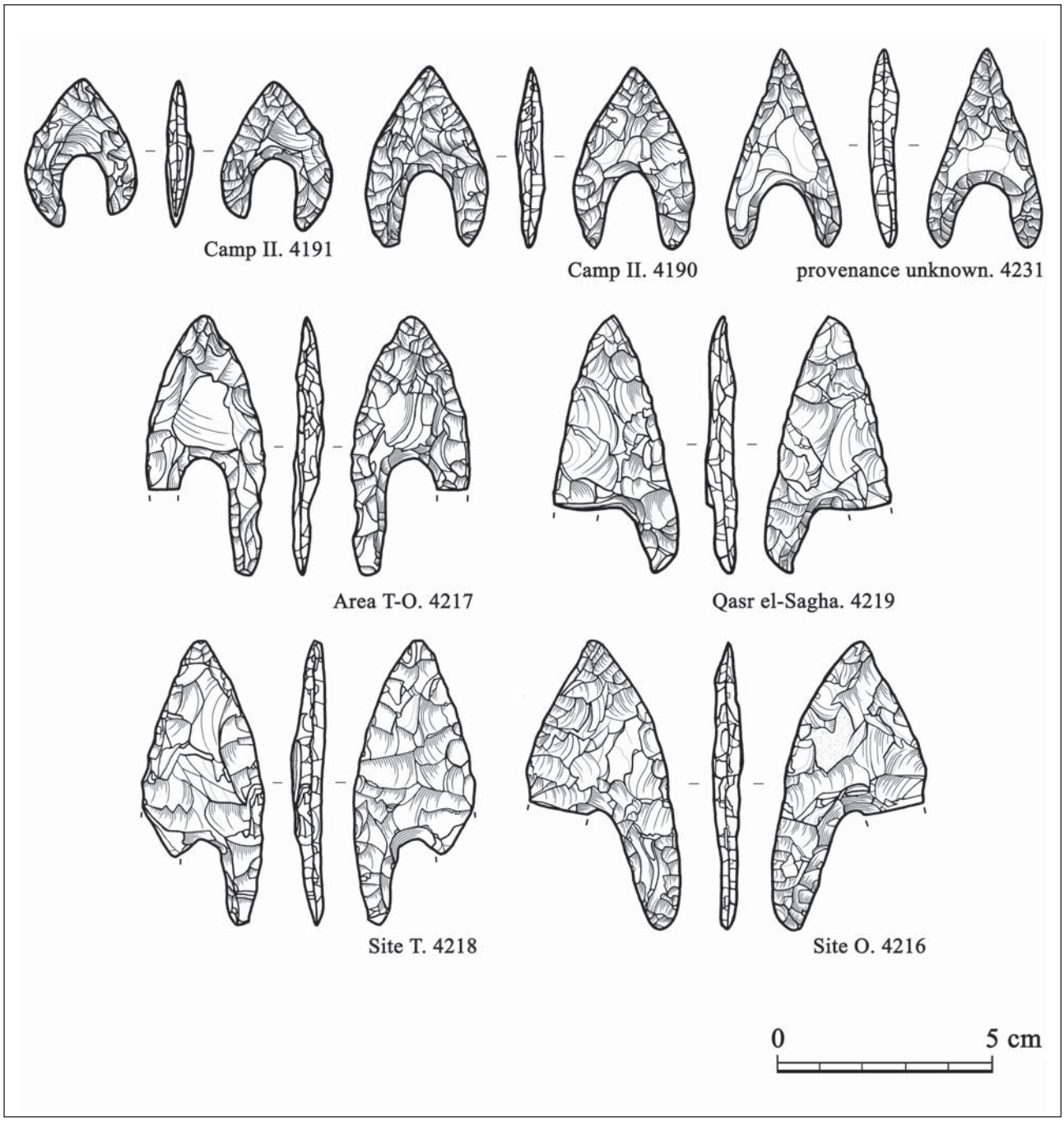

Fig.9
Knife blades, chisels and sickle blades.

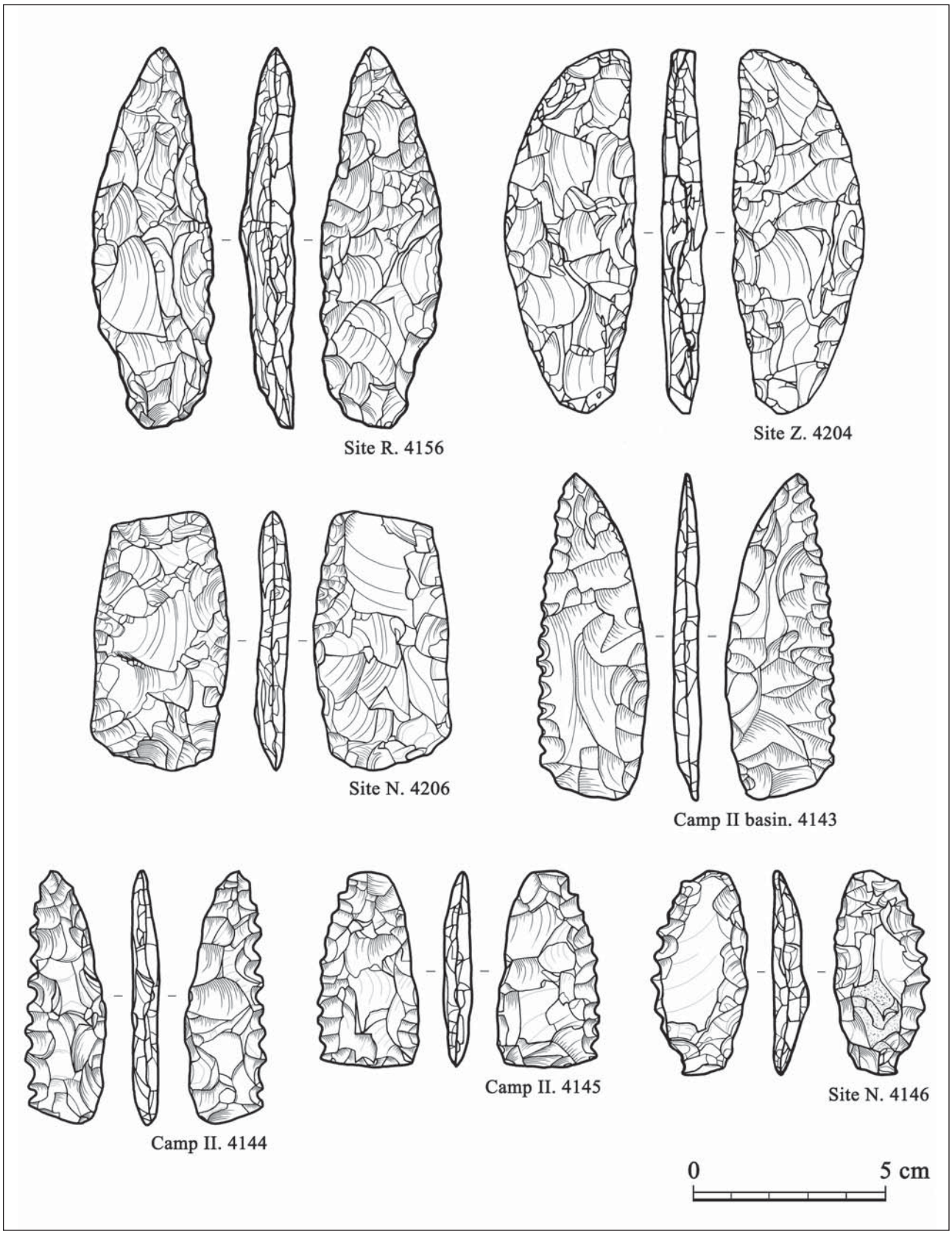

Fig.10
Scrapers, blades and retouched blades.

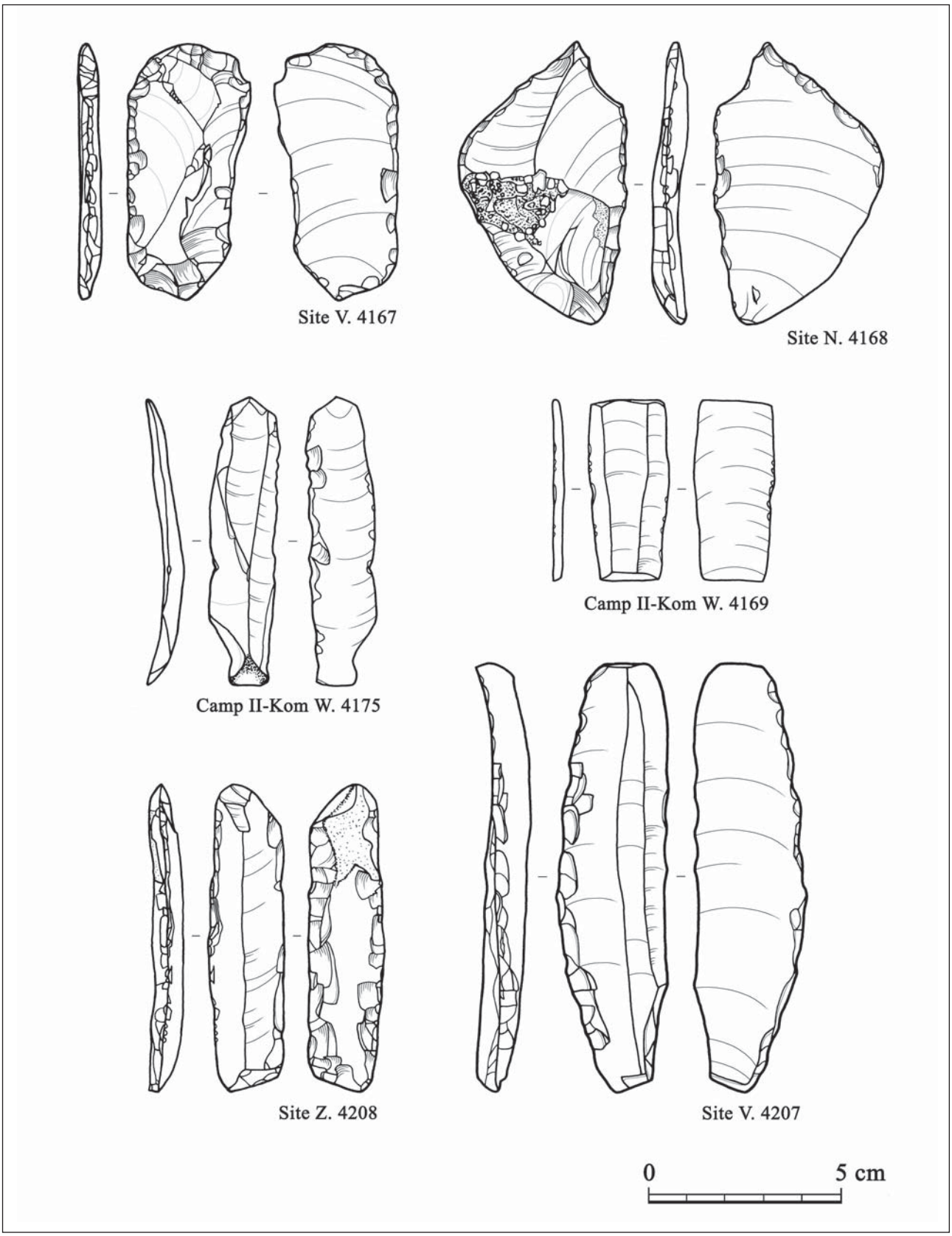

Fig.11
Knife blades and hollow grinders.

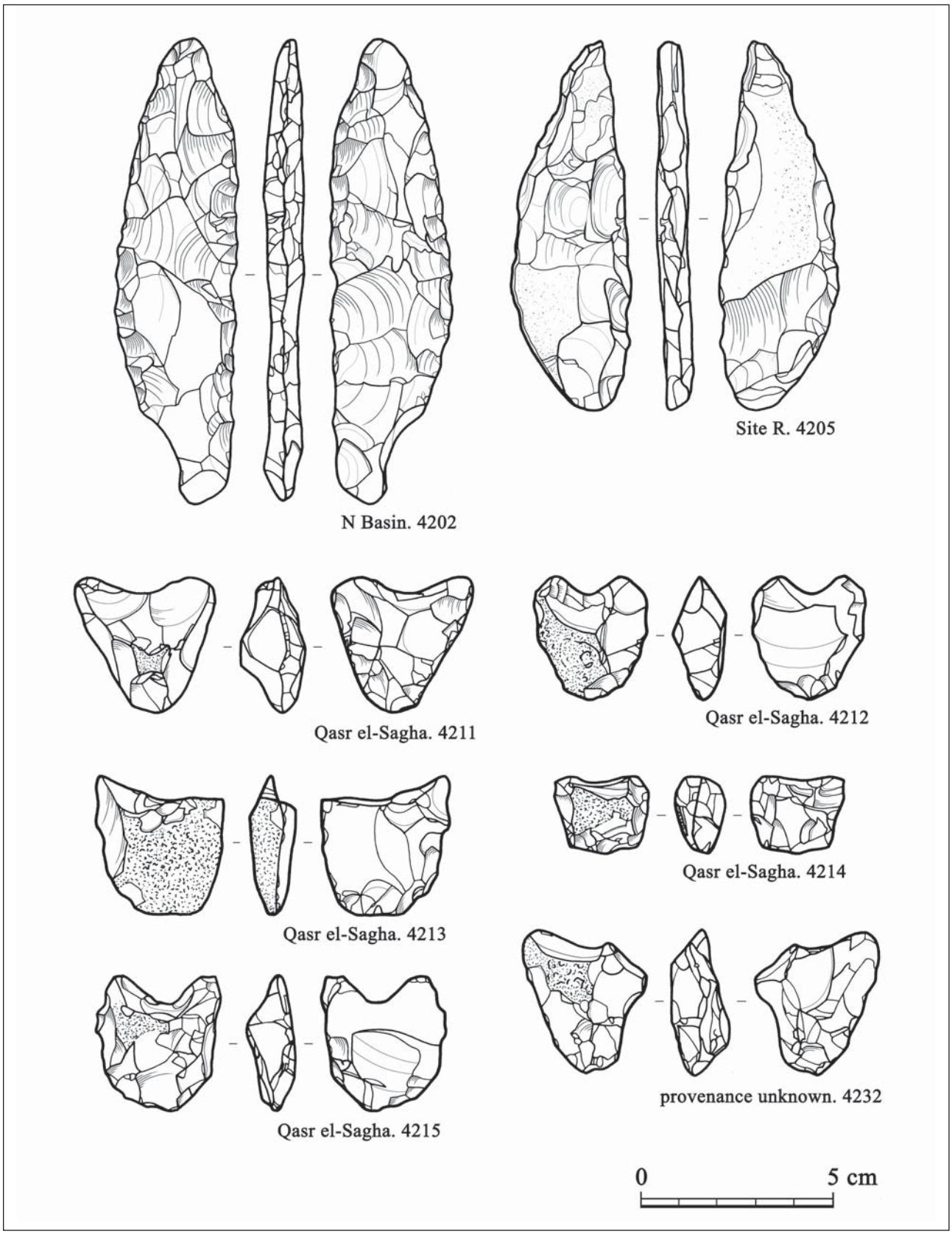

Fig.12
Core (no. 4209).

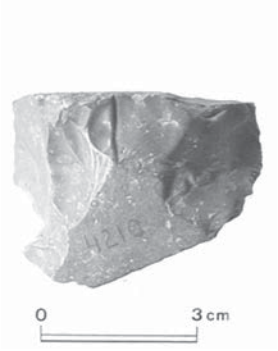

Fig.13
Core (no. 4210).

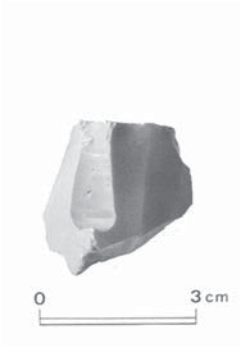

Fig.14
Core (no. 4228).

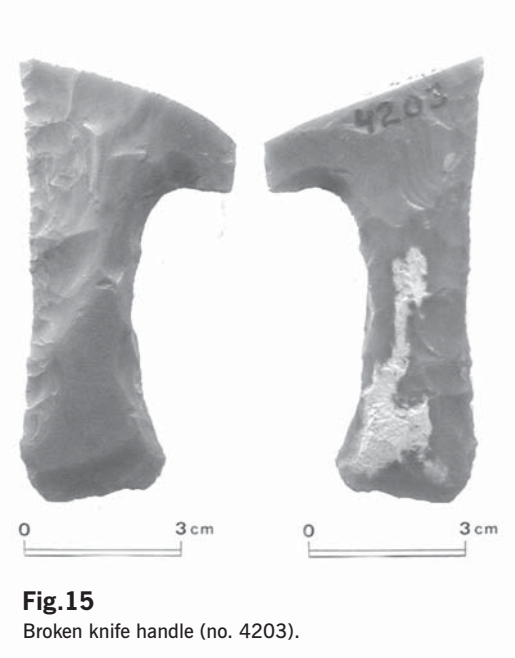

Fig.15
Broken knife handle (no. 4203).