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Filling the gap between the Fayum Epipalaeolithic and Neolithic

Introduction

The desert around Lake Qarun in the Fayum Depression has been well known for the scatters of elaborate stone tools since the 19th century, and many European antiquarians and archaeologists came to collect them around the turn of the 20th century. These stone tools are presently housed in museums around the world, but many of these stone tools have been left untouched in storage and unpublished, and hence have not received much scholarly attention. This article will describe what are known and unknown about Fayum Epipalaeolithic and Neolithic stone tools, and discuss what kind of new insights can be gained by studying such neglected museum collections. Emphasis is placed on the consideration that some undated tools can probably fill the alleged chronological and technological gap between the Fayum Epipalaeolithic and Neolithic.

Prehistory of the Fayum in publications and museum collections

There are three major publications on the corpus of prehistoric stone tools of the Fayum. The first is an article published by Heyward Seton-Karr in the Annual of the Antiquities Service of Egypt (Seton-Karr 1904). He was a very active British antiquarian who had sound knowledge of prehistoric archaeology through reading scholarly publications and loved prehistoric stone tools. He surveyed a wide area of the Fayum and made a large collection of stone tools. He sorted out the collection reasonably, and considered that most of carefully-retouched stone tools

in his collection would be dated to the Neolithic period by analogy with the stone tools of the European stone age.

The second major publication is one volume of the General Catalogues of the Egyptian Museum in Cairo published by the Canadian archaeologist Charles Currelly (Currelly 1913), and it deals with Seton-Karr's collection. Seton-Karr divided his Fayum collection into small portions and proudly donated them to many museums around the world, without making detailed inventories with destinations. Seton-Karr's Fayum collection in the Egyptian Museum in Cairo is thus only part of his whole collection but covers almost all types of Fayum prehistoric stone tools known to date. In the General Catalogue, Currelly classified Seton-Karr's stone tools more simply and presented good pictures of all tools housed in the Museum.

The third major publication is the British archaeologist Gertrude Caton-Thompson's monograph on her fieldwork and artefact study entitled *The Desert Fayum* (Caton-Thompson and Gardner 1934). She presented a new classification of stone tools and revealed that the users of those tools were Neolithic farmers who also lived on hunting and fishing. Her monograph is presently considered as the most authentic source of information about the prehistory of the Fayum, whereas Seton-Karr's and Currelly's publications tend to be ignored.

It must be kept in mind that Caton-Thompson was a relatively late visitor to the Fayum and that the Fayum was already disturbed by previous visitors' collecting activities when she started her fieldwork in the 1920s. As she mentioned (Caton-Thompson and Gardner 1934: 23, 31, 75, and 78-79), her fieldwork in the Fayum was not possible without Seton-Karr's preceding work, because her concession area (Fig. 1) was the same as his survey area and most of her sites had already been recognised by him and indicated on his survey maps (Seton-Karr 1904: fig.1; 1905, pl. I). Seton-Karr did not describe which stone tool was collected at which site in his publications, but it is possible that most of Caton-Thompson's sites had already been swept by Seton-Karr's collecting activity to a large extent. Therefore, the stone tool assemblage at each site reported by Caton-Thompson was not in an undisturbed state. In fact, Seton-Karr had collected some types of stone tools which had not been collected by Caton-Thompson, and it is obvious that Caton-Thompson's stone tool corpus is not perfect.

In addition, it must also be noted that Caton-Thompson did not publish all of her stone tool collection. It was common in the early 20th century that British archaeologists working in Egypt received financial support from many museums that were in need of nice objects for display, and then the archaeologists gave portions of their finds to the museums in appreciation for their financial support.

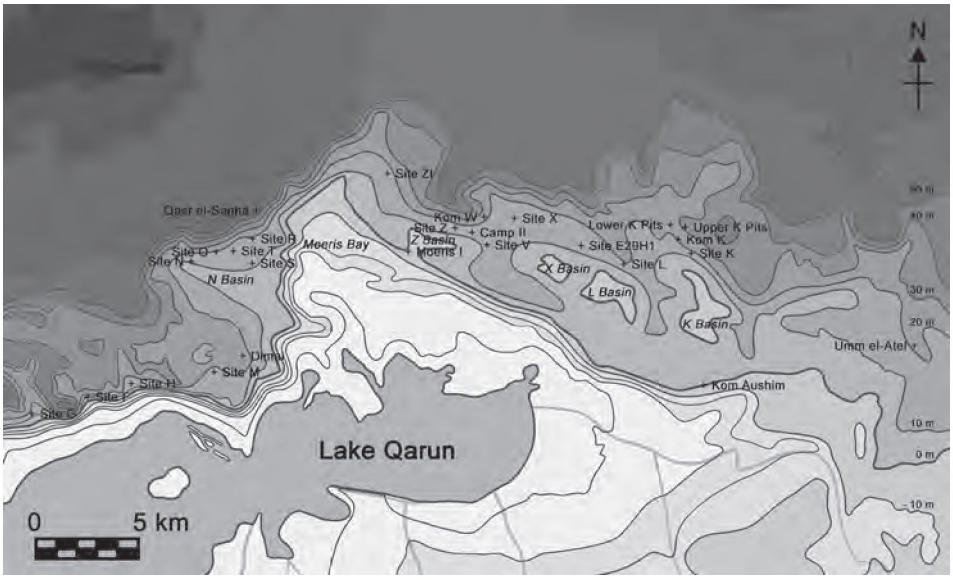


Fig. .1. Map of Caton-Thompson's sites on the northeastern shore of Lake Qarun

Caton-Thompson was not an exception. After a certain number of her finds in the Fayum were left in the Egyptian Museum in Cairo, the rest of her finds including stone tools, pottery and miscellaneous artefacts were brought to the United Kingdom. Masterpieces are kept and displayed in the Petrie Museum of Egyptian Archaeology in University College London and the British Museum, but the rest of her finds were distributed immediately after their arrival in the United Kingdom in 1926 and 1928, and thus long before the publication of *The Desert Fayum* in 1934. It is doubtful that she had enough time to study her collection thoroughly before the distribution. Therefore, it is worth studying her dispersed collection in order to know what are unpublished and to grasp the whole picture of her finds.

Whereas the majority of her collection were given to local museums in the United Kingdom, some portions were generously given to universities and research institutes in and outside of the United Kingdom. According to her distribution list (Caton-Thompson and Gardner 1934: xiv), her collection was finally distributed to 31 locations in nine countries, including Australia, Canada, Egypt, France, Ireland, Japan, the Netherlands, the United Kingdom and the United States. I have visited several museums which are known for housing Caton-Thompson's Fayum artefact collection, and happened to find other collections made by earlier visitors to the Fayum. These collections include many interesting stone tools which have never been exhibited and published.

A critical problem is that most of such collections in museums do not have much information about the exact provenance of individual artefacts. Ink inscriptions on individual artefacts merely say 'Fayum', and there is no clue to knowing exactly where in the Fayum they came from. Only Caton-Thompson neatly inscribed the find location on individual artefacts, and one can see at least which artefact derived from which of the sites she surveyed or excavated in the Fayum. In this situation, it is often said that museum collections of uncertain provenance are useless and worthless study. Nonetheless, it is significant to know what types of stone tools had already been collected before Caton-Thompson came to the Fayum, and to complement her stone tool corpus, through studying earlier visitors' publications and collections presently housed in museums.

Moreover, the present-day Fayum is severely disturbed. As many collectors have come to the Fayum and taken away a number of nice-looking stone tools on the desert surface since the publication of *The Desert Fayum*, very few formal tools are left in the field even though many debitage products are still there. As long as one works in the field, there are not many chances of dealing with formal tools. Another problem is that the Fayum is being rapidly destroyed by modern land use activities like farming and clay mining, and the chance of conducting fieldwork is being lost (Shirai 2010). In this circumstance, no one can say that Fayum stone tool collections in museums are worthless study. Rather, those stone tools in museums, which one cannot expect to obtain in the field anymore, are really important and valuable, and one must seriously consider how to make the most of them for a better understanding of the Fayum prehistory.

Fayum Epipalaeolithic and Neolithic tool classification and chronology

Caton-Thompson identified 25 classes of prehistoric stone tools that she obtained through excavations at some sites like Kom K and Kom W and surface collection at many sites (Caton-Thompson and Gardner 1934, 19-22). They are:

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

She divided them into two groups according to their vertical locations, naming the Neolithic A group and the Neolithic B group respectively. The A group distributed at higher elevations of the slopes of prehistoric lakeshores, whereas the B group distributed at lower elevations of the slopes.

According to her, the A group includes:
1) ground and polished axes
2) polished and flaked axes
4) adzes
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

The B group includes:
22) backed blades
Some types of 24) tanged arrowheads

She speculated that the following tool classes might probably belong to both A group and B group because they were often found at middle elevations:

3) flaked axes
5) gouges
6) planes
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
23) trihedral rods

She also suggested that some of 21) scrapers and some of 25) leaf-shaped arrowheads might be dated to the post-Neolithic. On the other hand, she left the date of the majority of 24) tanged arrowheads and 25) leaf-shaped arrowheads uncertain (Caton-Thompson and Gardner 1934: 19-22).

As she assumed that the lake level kept lowering 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 the A group at higher elevations was earlier in date than the B group at lower elevations, and that elaborate A group tools degenerated into crude B group tools through time (Caton-Thompson and Gardner 1934: 55-67).

New research by the Combined Prehistoric Expedition in the 1960s revealed that the B group is actually earlier in radiocarbon date than the A group and must be understood as an Epipalaeolithic culture named the Qarunian because it is characterised by microlithic tools. The A group was also radiocarbon-dated by using a sample from Kom W, the type site of the A group, and was recognised as the true Neolithic culture because of its lithic manufacturing techniques characterised by polishing and bifacial pressure flaking. The Fayum Epipalaeolithic falls in the 7th millennium BC, whereas the Fayum Neolithic falls in the middle 5th millennium BC. It was also revealed through geological observations that the lake level was fluctuating and seemed to have dropped at the transition between the Epipalaeolithic and Neolithic. Based on these new data, it was argued that there was a great chronological and technological break between the Epipalaeolithic and Neolithic, and it was asserted that the Fayum had been deserted and abandoned at the end of the Epipalaeolithic, and about 1200 years later, reoccupied by new

people who brought new technology (Wendorf and Schild 1976: 317-319). These argument and assertion were uncritically accepted by another research team that came to the Fayum in the 1980s (Wenke et al. 1988; 1989).

However, one problem still remains. Even though the A group and B group were radiocarbon-dated and reconsidered as Neolithic and Epipalaeolithic respectively, the transitional group at middle elevations, which was presumed by Caton-Thompson to belong to both A group and B group, was not considered at all, and many tools found at middle elevations are not surely dated. A question is whether there was really a great chronological and technological break between the Epipalaeolithic and Neolithic. The present situation is merely that several radiocarbon dates were obtained from high elevations and low elevations but not from a middle elevation. Therefore, it can be argued that the break between the two culture groups was actually made by this manner of sampling, and that undated tools at middle elevations may probably fill the alleged chronological and technological gap. I have argued elsewhere that some undated tool classes like 6) planes, 17) pebble-butted points/knives, 18) pebble-backed knives/scrapers, and 19) side-blow flakes could most probably be dated to the 6th millennium BC because similar well-dated tools are currently known at several sites in the Egyptian Western Desert (Shirai 2010; 2011). In the following, I would like to show some more tools which may be dated to the asserted blank period between the Epipalaeolithic and Neolithic, and to discuss that there may have been no considerable chronological break between them.

Some tool classes of the presumably transitional group

a) Small leaf-shaped or tanged arrowheads

Caton-Thompson collected hundreds of small arrowheads, but she was not sure about their date, as mentioned above. She presented only a small number of arrowheads as of uncertain date (Caton-Thompson and Gardner 1934: 22 and pl. LI), and did not publish all of her arrowhead collection in detail. Her unpublished collection in museums actually includes a variety of arrowheads (Fig. 2).

Thanks to the development of field research in the Egyptian Western Desert after the time of Caton-Thompson, such small arrowheads are currently well known in the northern half of the Egyptian Western Desert, and their first appearance is considered to be around 6500 cal BC (Riemer 2007a; 2007b; Kindermann 2010; McDonald 2013). It must be stressed here that these types of small arrowheads were quite common in the contemporaneous southern Levant. The southern Levant has a long tradition of making unifacially- or bifacially-

retouched, large arrowheads of up to 10 cm long since the Pre-Pottery Neolithic B (henceforth PPNB), but from around 6500 cal BC, much smaller arrowheads of less than 4 cm long appeared and became popular through the Pottery Neolithic (6500-5800 cal BC) (Gopher 1994; Rosen 2012). The spread of small arrowheads was almost simultaneous in the southern Levant and the Egyptian Western Desert. In this circumstance, it is very unlikely that only the Fayum was isolated from this trend. It is reasonable to consider that the undated small arrowheads of the Fayum in question are most likely to be dated to the middle 7th – early 6th millennia BC, which has been asserted as a blank period between the Fayum Epipalaeolithic and Neolithic.

When the assemblage of small arrowheads in the Fayum is examined in detail, tanged and winged short arrowheads, which are very similar to the Haparsa points of the Pottery Neolithic in the southern Levant, look outstanding. This type of arrowhead, as shown at right in the lower row in Fig. 2, is rare to absent at other sites in the Egyptian Western Desert, and their rarity or absence becomes the basis for an argument that small leaf-shaped or tanged arrowheads may have developed in the Egyptian Western Desert independently of the cultural influence from the southern Levant (McDonald 2013). It is not certain whether this was really the case, but it seems certain that their presence in the Fayum suggests a stronger cultural connection between the southern Levant and Fayum around the middle 7th – early 6th millennia BC, and this is only natural, considering the close distance between them.

b) Knives and daggers

Other tools that may be dated to the alleged blank period between the Fayum Epipalaeolithic and Neolithic are some types of knives. According to Caton-Thompson's classification, there are several types of knives (Caton-Thompson and Gardner 1934: 20-21 and pls. XXXVI-XXXVII, XLI-XLII and XLIV). However, her typology is difficult to understand, because she did not focus on the blade form but on the presence of cortex on the tool surface, and separated a pebble-butted knife class, a pebble-backed knife class and a dagger class from a knife blade class. By focusing on the blade form, they can be reconsidered as A) slender, tapered, single-edged form (the chef's knife type), B) slender, tapered, double-edged form (the dagger type), C) broad, tapered, single-edged form (the butcher knife type), D) long, narrow, single-edged form with a slight curve to the tip (the katana type), E) broad, single-edged form broadening to the tip which ends obliquely (the machete type).

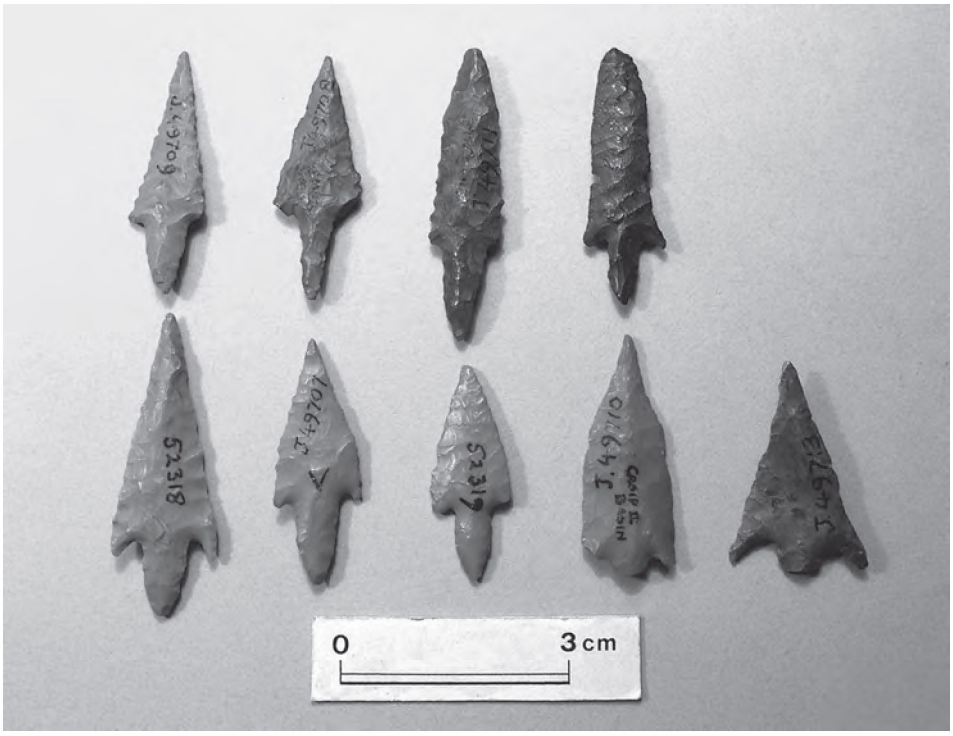


Fig. 2. Small arrowheads from various sites (Cairo JE49709, JE49708, JE49711, JE49712, JE52318, JE49707, JE52319, JE49710, JE49713)

In the southern Levant, complete examples of daggers are very few and most of them are fragmentary, but they certainly appeared no later than the early 6th millennium BC in the Mediterranean coastal regions (Olami *et al.* 1977). On the other hand, there are many complete examples of elaborate daggers and knives of both straight and curved forms at such sites as Djara and Farafra Oasis in the Egyptian Western Desert, and they are dated to the middle 6th millennium BC (Barich and Lucarini 2002; Kindermann 2010; Barich *et al.* 2012). Many of them are characterised by patches of calcareous cortex on one face or both faces, and this suggests that tabular flint nodules from limestone beds were used.

As long as one reads Caton-Thompson's publication, the variation of knives in the Fayum looks different from that in other contemporaneous sites in the Egyptian Western Desert. As she mentioned (Caton-Thompson and Gardner 1934: 20-21), some Fayum examples of the chef's knife type retain large patches of calcareous cortex on one face, but these seem to be few. The majority in the Fayum are pebble-butted and/or pebble-backed knives which have a tapered blade and

brown cortex on butt and/or lateral side. This suggests that rounded flint cobbles, which naturally occur in the Fayum, were preferentially used. Daggers and curved knives, which are common in the Egyptian Western Desert, are not well presented in Caton-Thompson's publication, except for one example for each (Caton-Thompson and Gardner 1934: pl. XXXVII-6 and pl. XLIV-2).

However, some examples in unpublished Caton-Thompson's collection (Figs. 3-5) demonstrate that the Fayum actually had more daggers and curved knives which are comparable to those from the sites in the Egyptian Western Desert mentioned above. Therefore, it can be considered that such knives and daggers in the Fayum are not stray items, but that their presence probably indicates the continuous human occupation of the Fayum in the middle 6th millennium BC.

Fig. 3. Dagger from Site K (Cairo JE52325)

c) Serrated sickle blades

Bifacially pressure-flaked, unilaterally serrated sickle blade is a hallmark of the Fayum Neolithic which is represented by type sites like Upper and Lower K Pits, Kom K and Kom W dated to around 4500 cal BC. However, it can be argued that its first appearance in the Fayum may have been much earlier in date than previously believed.

Sickle blades are apparently for harvesting cereal crops, and their first appearance in Egypt is most likely related to the diffusion of farming from the southern Levant to somewhere in Lower Egypt. The southern Levant has a long history of sickle blade making. According to some synthetic studies of the development of sickle blades in the southern Levant (Rosen 1997: 134-140; Gopher *et al.* 2001), sickle blades of the PPNA and PPNB were usually made from large blades or blade segments with slight lateral side serration, and thus their body form was narrow. It was in the PPNC and Pottery Neolithic Yarmukian culture in the 7th millennium BC that sickle blades were made from blade segments or flakes and were sparsely and deeply serrated bifacially on one or two lateral sides though the body was not thor-

oughly pressure-flaked bifacially. It was only in the Pottery Neolithic Lodian culture of the early-middle 6th millennium BC that flakes were thoroughly pressure-flaked bifacially, and their one lateral side was densely and shallowly serrated. Their body form tended to be wide. Such elaborate sickle blades declined in the southern Levant in the subsequent Wadi Raba and Qatifian cultures of the late 6th - early 5th millennia BC, and coarse serration on one lateral side of a blade or blade segment became common. The sickle blades of the Fayum Neolithic are most similar to those of the Lodian, but the sickle blade of the Lodian type disappeared in the southern Levant approximately 1000 years before they appeared at the type sites of the Fayum Neolithic mentioned above. Therefore, this chronological gap must be explained.

As shown in Figs. 6-8, there are variations in the sickle form in the Fayum, but Caton-Thompson has not highlighted these variations. She just mentioned that there were a pointed form and a rectangular form (Caton-Thompson and Gardner 1934: 21). The pointed and wide form was very common not only at Kom K and Kom W but also at the Levels II, III, IV and V of Merimde Beni Salama which are known to fall in the middle-late 5th millennium BC (Eiwanger 1988; 1992), but the narrow form with coarse serration is not common in Merimde. Coarsely serrated narrow sickle blades are not uncommon at surface sites in the Fayum (Caton-Thompson and Gardner 1934: Pl.XL), though it seems that the variation shown in Fig. 6 is a rare example even in the Fayum. Their exact dates are not obtained. It is not certain whether all of the variations are in the same period.

Fig. 4. Knife from Site Z (Cairo JE49739)

Fig. 5. Knife from Area L-X (Cairo JE52302)

Fig. 6. Sickle blade from Site X (Cairo JE52304)

Recently, some coarsely serrated narrow sickle blades have been discovered in the middle of the Egyptian Western Desert where there is no permanent standing water and no evidence of crop farming. At Seton Hill, which is approximately 150 km to the southwest of the Fayum, a bifacially flaked, unilaterally serrated sickle blade, whose tip is broken but is considered to have been pointed, has been collected on the surface, and is roughly dated to 5600-5200 cal BC based on associated diagnostic artefacts of the region (Kindermann 2010: 107-108, 471-472, fig. 302-1). Another four bifacially flaked, unilaterally serrated sickle blades, three of which are broken but are considered to have been pointed, have been found at different localities in Abu Gerara, approximately 400 km to the southwest of the Fayum. The localities are dated to around 5600-5200 cal BC based on a radiocarbon date and associated diagnostic artefacts (Riemer 2010: 612-632, 652, 659, fig. 33-1 and 33-2, fig. 70-5 and fig. 76-5). It is difficult to explain why there were sickle blades in such places, but it can be assumed on the basis of their presence in that period that the narrow form with coarse serration may be earlier in date than the wide form with fine serration, and that the first appearance of coarsely serrated narrow sickle blades in the Fayum would probably have been in the early-middle 6th millennium BC.

d) Flaked axes

Flaked axe of the trapezoidal or triangular form is also a hallmark of the Fayum Neolithic. As flaked axe did not exist in the preceding period, it is most likely that the axe was mainly used for shrub clearance at the beginning of farming and derived from the southern Levant.

The southern Levant has a long history of stone axe making. Flaked axes of oval to trapezoidal forms with polished working edge already appeared in the Middle PPNB, and there has been no notable technological development until

the Pottery Neolithic. Then, stone axes started to decline and were gradually replaced by rather elongated ones that should be called adzes and chisels through the Chalcolithic (Rosen 1997; Barkai 2005). Although not dealt with in a comprehensive study of axes in the prehistoric southern Levant (Barkai 2005), there seems to have been a unique axe making convention of leaving a patch of cortex on top of a body in the Pottery Neolithic Lodian culture (Yeivin and Olami 1979). As it is not difficult to remove such a patch of cortex in the making process, it appears to have been left there intentionally. However, such a patch of cortex does not seem to have had any practical function, and probably it is intended to show the raw material source as a brand mark. This odd feature is known in the examples from the type sites of the Fayum Neolithic (Fig. 9). In particular, Kom W has yielded the largest number of axes in the Fayum, and Caton-Thompson noted that flaked axes from Kom W frequently retain a patch of cortex on top of their bodies (Caton-Thompson and Gardner 1934: 26). However, not many illustrations and pictures of such axes are published, and such a patch of cortex is easily overlooked unless one handles real objects in museums.

As is the case with serrated sickle blades, the flaked axes of the Lodian type disappeared in the southern Levant approximately 1000 years before they appeared at the type sites of the Fayum Neolithic mentioned above. Therefore, this wide chronological gap needs to be explained. Unlike the serrated sickle blades, no comparable examples of axes are known in other regions of Egypt for arguing that the first

Fig. 7. Sickle Blade from Site X (Cairo JE49121)

Fig. 8. Sickle blade from Site X (Cairo JE52307)

appearance of such peculiar axes in Egypt was in the early-middle 6th millennium BC. However, considering that it is unlikely for such tools to appear suddenly out of nowhere in Egypt, it is no wonder if they derived from the Lodian of the southern Levant and appeared first somewhere in Lower Egypt and then in the Fayum as early as the 6th millennium BC, and persisted for a long time.

Fig. 9. Flaked axe from Lower K Pit 87 (Cairo JE52299)

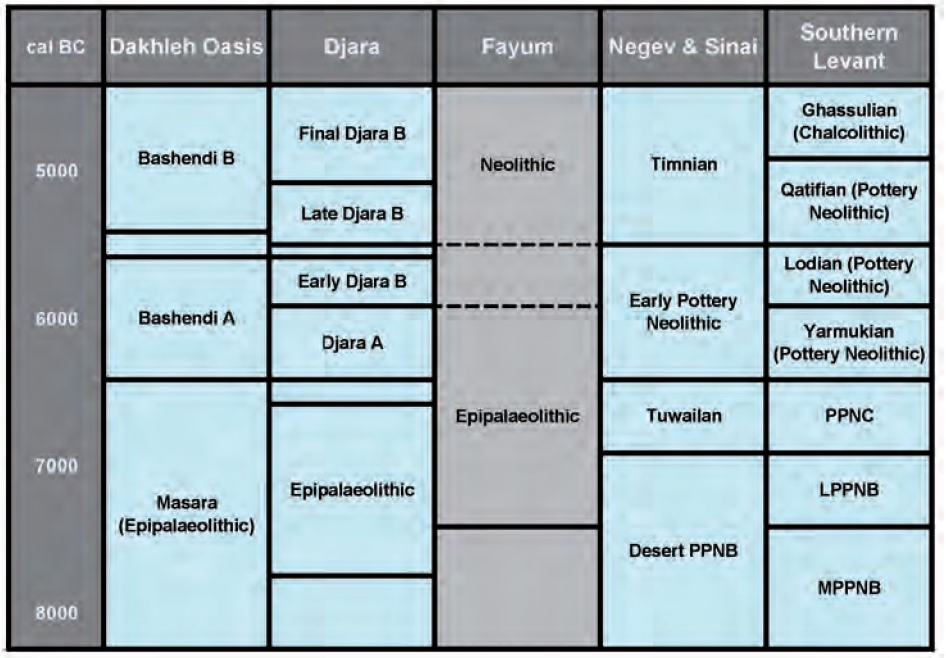
Discussions

It has been suggested that some tools in the Fayum might be put in the early 6th millennium BC, which had been asserted as a blank period between the Fayum Epipalaeolithic and Neolithic. It has also been demonstrated that farming-related tools in the Fayum Neolithic are similar to those of the Pottery Neolithic Lodian culture of the southern Levant that flourished in the early 6th millennium BC. Based on these things, new discussions are needed.

From a technological point of view, the first discussion is whether it is good to think that the Fayum Epipalaeolithic culture continued until around 6000 cal BC (*cf.* Shirai 2012). As described above, small bifacial arrowheads and large bifacial knives and daggers seem to have spread in the Egyptian Western Desert from around 6500 cal BC, and this is a great technological change and a hallmark of a new age, like the Bashendi A phase of Dakhleh Oasis and the Djara A phase of Djara. As Table 1 indicates, there is no consistency in chronological sequence between the Fayum and its neighbouring regions, and only the Fayum chronology looks very strange. Therefore, this Fayum chronology has to be reconsidered. The Fayum Epipalaeolithic should better end around 6500 cal BC at the latest, and a transitional period prior to the Neolithic needs to be inserted, especially if the original definition of the Fayum Neolithic by Caton-Thompson based on the type sites like Kom K and Kom W dated to the middle 5th millennium BC is kept unchanged.

The second discussion is whether the old assertion that the Fayum was deserted and abandoned around the end of the 7th millennium BC and later reoccupied by new comers with new technology is still acceptable. The lack of radiocarbon dates in a certain period in question is not necessarily the evidence for the de-

Table 1. Early-Middle Holocene chronology of Egypt and the southern Levant



population in the Fayum but may have been caused by the lack of data collecting at right sites. Even though geological data suggest that the lake level has been fluctuating and lowering, lithic evidence seems to suggest that the Fayum had never been deserted and abandoned but had been continuously occupied throughout the 7th-6th millennia BC.

If this was really the case, the third discussion is whether the Fayum Neolithic culture should be considered as a foreign culture brought by new comers. While the Fayum Neolithic culture had many tools in common with contemporaneous cultures of the Egyptian Western Desert, it was strongly influenced by the Pottery Neolithic Lodian culture, as exemplified by farming-related tools. However, the timing of the appearance of Lodian cultural influence and its long persistence in the Fayum despite its quick disappearance in the southern Levant and no more similarity in material culture between the Fayum and southern Levant thereafter suggest that the contact between them was minimum and very short-term, regardless of whether it was by human migration or by trade. On the other hand, as represented by elaborate concave-based arrowheads, the morphological development of some tool classes which are not directly related to farming activities

in the Fayum Neolithic is definitely autonomous, as comparable developments are known neither in the southern Levant nor in the Egyptian Western Desert. Therefore, the uniqueness of the Fayum Neolithic culture must be understood in terms of the persistence and diversification of tools rather than just the adoption of some foreign elements. Even though the human migration from the southern Levant to somewhere in Lower Egypt at the time of the diffusion of farming is not deniable, it seems that its demographic impact on the Fayum population was not great and that the Fayum Neolithic material culture was developed mostly by indigenous people.

REFERENCES

BARICH, B. E. and G. LUCARINI. 2002. Archaeology of Farafra Oasis (Western Desert, Egypt): A Survey of the Most Recent Research. *Archéo-Nil* 12: 101-108.

BARICH, B. E., LUCARINI, G., GALLINARO, M. and M. HAMDEN. 2012. Sheikh/Bir El Obeiyid: Evidence of sedentism in the Northern Farafra Depression (Western Desert, Egypt). In: J. Kabaciński, M. Chłodnicki and M. Kobusiewicz (eds.), *Prehistory of Northeastern Africa: New Ideas and Discoveries* (= Studies in African Archaeology 11): 255-278. Poznań.

BARKAI, R. 2005. *Flint and Stone Axes as Cultural Markers: Socio-Economic Changes as Reflected in Holocene Flint Industries of the Southern Levant*. Berlin.

CATON-THOMPSON, G. and E. W. GARDNER. 1934. *The Desert Fayum*. London.

CURRELLY, C. T. 1913. *Catalogue Général des Antiquités Égyptiennes du Musée du Caire Nos. 63001-64906: Stone Implements*. Le Caire.

EIWANGER, J. 1988. *Merimde-Benisalâme II: Die Funde der mittleren Merimdekultur*. Mainz am Rhein.

EIWANGER, J. 1992. *Merimde-Benisalâme III: Die Funde der jüngeren Merimdekultur*. Mainz am Rhein.

GOPHER, A. 1994. *Arrowheads of the Neolithic Levant: A seriation analysis*. Winona Lake.

GOPHER, A., BARKAI, R. and A. ASAF. 2001. Trends in sickle blades production in the Neolithic of the Hula Valley, Israel. In: I. Caneva, C. Lemorini, D. Zampetti and P. Biagi (eds.), *Beyond Tools: Redefining the PPN Lithic Assemblages of the Levant*: 411-425. Berlin.

KINDERMANN, K. 2010. *Djara: Zur mittelholozänen Besiedlungsgeschichte zwischen Niltal und Oasen (Abu-Muharik-Plateau, Ägypten) Teil 1*. Köln.

MCDONALD, M. M. A. 2013. Whence the Neolithic of Northeastern Africa? Evidence from the Central Western Desert of Egypt. In: N. Shirai (ed.), *Neolithisation of Northeastern Africa*: 175-192. Berlin.

OLAMI, Y., BURIAN, F. and E. FRIEDMAN. 1977. Givat Haparsa: A Neolithic site in the coastal region. *Eretz Israel* 13: 34-47.

RIEMER, H. 2007a. Out of Dakhla: Cultural diversity and mobility between the Egyptian Oases and the Great Sand Sea during the Holocene humid phase. In: M. Chłodnicki, K. Kroeper and M. Kobusiewicz (eds.), *Archaeology of Earliest Northeastern Africa* (= Studies in African Archaeology 9): 491-526. Poznań.

RIEMER, H. 2007b. When hunters started herding: Pastro-foragers and the complexity of Holocene economic change in the Western Desert of Egypt. In: M. Bollig, O. Bubenzer, R. Vogelsang and H.-P. Wotzka (eds.), *Aridity, Change and Conflict in Africa*: 105-144. Köln.

RIEMER, H. 2010. Archäologischer Survey auf dem südlichen Abu-Muharik-Plateau. In: *Djara: Zur mittelholozänen Besiedlungsgeschichte zwischen Niltal und Oasen (Abu-Muharik-Plateau, Ägypten) Teil 2*: 547-714. Köln.

ROSEN, S. A. 1997. *Lithics after the Stone Age: A Handbook of Stone Tools from the Levant*. Walnut Creek.

ROSEN, S. A. 2012. Lithic industries during the Holocene period. In: D. T. Potts (ed.), *A Companion to the Archaeology of the Ancient Near East*: 236-260. Oxford.

SETON-KARR, H. W. 1904. Fayoom Flint Implements. *Annales du Service des Antiquités de l'Égypte* 5: 145-186.

SETON-KARR, H. W. 1905. Discovery of A Neolithic Settlement in the W. Desert N. of the Fayoum. *Annales du Service des Antiquités de l'Égypte* 6: 185-187.

SHIRAI, N. 2010. *The Archaeology of the First Farmer-Herders in Egypt: New Insights into the Fayum Epipalaeolithic and Neolithic*. Leiden.

SHIRAI, N. 2011. A missing chapter of The Desert Fayum: Fayum lithic artefact collection in the Allard Pierson Museum, Amsterdam. *Archéo-Nil* 21: 115-146.

SHIRAI, N. 2012. The Fayum Epipalaeolithic in the light of new discoveries. In: J. Kabaciński, M. Chłodnicki and M. Kobusiewicz (eds.), *Prehistory of Northeastern Africa: New Ideas and Discoveries* (= Studies in African Archaeology 11): 225-253. Poznań.

WENDORF, F. and R. SCHILD. 1976. *Prehistory of the Nile Valley*. New York.

WENKE, R. J., LONG, J. E. and P. E. BUCK. 1988. Epipaleolithic and Neolithic Subsistence and Settlement in the Fayum Oasis of Egypt. *Journal of Field Archaeology* 15: 29-51.

WENKE, R. and M. CASINI. 1989. The Epipaleolithic-Neolithic transition in Egypt's Fayum Depression. In: L. Krzyżaniak and M. Kobusiewicz (eds.), *Later Prehistory of the Nile Basin and the Sahara* (= Studies in African Archaeology 2): 140-155. Poznań.

YEIVIN, E. and Y. OLAMI. 1979. Nizzanim -A Neolithic site in Nahal Evtah: Excavations of 1968-1970. *Tel Aviv* 6: 99-135.