

## STONE TOOL PRODUCTION

## صناعة الأدوات الحجرية

*Thomas Hikade*

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## STONE TOOL PRODUCTION

## صناعة الأدوات الحجرية

Thomas Hikade

Steingeräteherstellung

Industrie lithique

*In ancient Egypt, flint or chert was used for knapped stone tools from the Lower Palaeolithic down to the Pharaonic Period. The raw material was available in abundance on the desert surface, or it could be mined from the limestone formations along the Nile Valley. While the earliest lithic industries of Prehistoric Egypt resemble the stone tool assemblages from other parts of Africa, as well as Asia and Europe, the later Prehistoric stone industries in Egypt had very specific characteristics, producing some of the finest knapped stone tools ever manufactured in the ancient world. Throughout Egypt's history, butchering tools, such as knives and scrapers, and harvesting tools in the form of sickle blades made of flint, underlined the importance of stone tools for the agrarian society of ancient Egypt.*

استخدم المصري القديم الظران أو حجر الصوان في صناعة الأدوات الحجرية منذ العصور الحجرية البكرة وحتى العصور الفرعونية، وكانت المواد الخام اللازمة موجودة بكثرة بالصحراء أو كان يمكن إستخلاصها من تكوينات الحجر الجيري على طول وادي النيل. كانت الصناعة الحجرية المصرية بعصور ما قبل التاريخ مشابهة للصناعة الحجرية بأفريقيا وآسيا وأوروبا، ولكن إختلفت هذه الصناعة في مصر بأخر عصور ما قبل التاريخ وأصبحت فريدة من نوعها ونتج عنها أجود أنواع الأدوات الحجرية بالعالم القديم بأكمله. ان كثرة وإستخدام الأدوات الحجرية على مدار تاريخ مصر القديمة مثل أدوات الجزاره ومنها السكاكين، وأدوات الزراعة ومنها المنجل ذو الحد المصنوع من الظران توضح أهمية الأدوات الحجرية للمجتمع الزراعي بمصر القديمة.

**E**vidence for anatomically modern humans exists for approximately 200,000 years, yet stone tools of a much older age have been found in Africa, Europe, and Asia. These stone tools were made by our ancestors, such as *homo habilis* or *homo erectus*. It is with the latter that we can associate the finds from the Lower Palaeolithic (700,000-175,000 BCE) in Egypt, a time when the climate was semi-arid with savannahs and annual rainfalls of about 250-500 mm (Butzer 1980). Yet, so far, none of the tools have actually been found in association with bones of *homo erectus*.

The Lower Palaeolithic starts with the appearance of the Acheulean industry, named after the site Saint-Acheul in France, which is rarely found in datable contexts in Egypt. Finds of this period were discovered in Western Thebes in Upper Egypt in the 19<sup>th</sup> century (Pitt Rivers 1882 and Schweinfurth 1902, 1903), while finds from Lower Egypt come from Abbasiya, near Cairo (Bovier-Lapierre 1926). A first attempt to summarize the Old Stone Age in Egypt was made by Jacques de Morgan (1897), and surveys along the Nile Valley in Nubia and Egypt, as well as in the Fayum oasis, aimed to document and

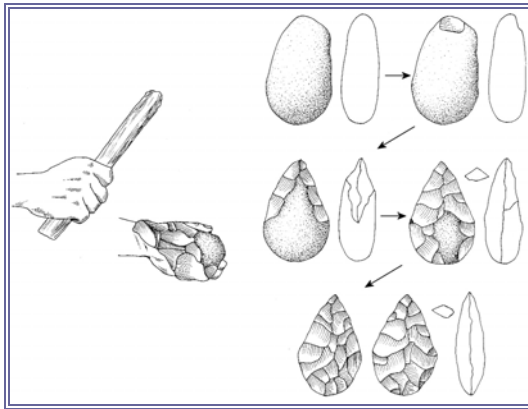


Figure 1. Making a bifacial hand axe.

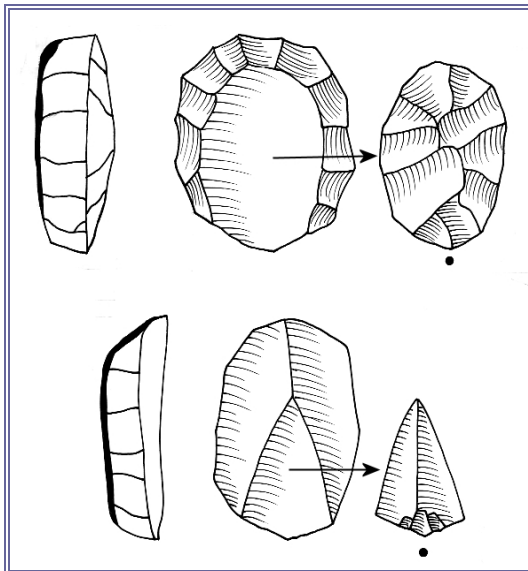


Figure 2. Levallois flake and point.

associate the geology of Egypt with its prehistory (Sandford 1934; Sandford and Arkell 1939). In the early 1930s, excavations were undertaken in the Fayum oasis (Caton-Thompson and Gardner 1934), whence Palaeolithic artifacts were already known (Seton-Karr 1904). The Kharga Upper Acheulean industry was later described as having produced very well-made handaxes with some simple Clactonian choppers (Caton-Thompson 1952). Further south in the Western Desert, at sites such as Bir Tarfawi and Bir Sahara, late Acheulean lakes allowed humans to exploit aquatic resources (Wendorf et al. 1993). A recent study concentrating on the site of Nag Ahmed el-Khalifa, south of

Abydos, which dates to 400,000-300,000 BP, found that the people there fully focused on handaxes as their main tool type, most being of cordiform shape (Vermeersch, P.M. et al. 2000: 57 - 73). Handaxes were indeed the main tool type of the Lower Palaeolithic. *Homo erectus* removed flakes from a nodule on the ventral and the dorsal surface with a direct hammer stone technique, giving the tool an amygdaloid, subtriangular, lanceolate, or cordiform shape with converging edges (fig. 1). The multi-functional ax would have satisfied various needs, such as crushing bones, skinning mammals, scraping hides, etc. - in short, butchering found carcasses or hunted game and, when needed, it could be used as a weapon. It remains surprising that the handax was so long-lasting and dominated flint tools for several hundreds of thousands of years. One reason for this conservatism may have been the inability of early humans to fully integrate knapping skills and toolkits with knowledge of the environment.

### *The Middle Palaeolithic*

The Middle Palaeolithic (175,000-40,000 BCE) saw the appearance of modern humans in Africa and some human remains have been found associated with Middle Palaeolithic material (Wendorf and Schild 1992: 53 - 54). This time period is essentially characterized by a higher stone tool variety in comparison with the Lower Palaeolithic, which also reflects cultural diversity. The lithic industries of the Middle Palaeolithic are also known as Mousterian, after the type site of Le Moustier, a rock shelter in the Dordogne in southwestern France. The Mousterian is characterized by its special core reduction strategy ("Levallois technique"). Using a hard hammer technique, this technique provided control over the size and shape of the final flake. The method also allowed for the production of projectile points, the so-called "Levallois points" (fig. 2). A variant in Egypt and Sudan was the Nubian Levallois point (fig. 3). Levallois points could be attached to a wooden shaft as sharpened spear heads. The instrument could be used as a thrusting weapon, but also could be thrown at prey,

thus reducing the risk of injury during the hunt and enabling the hunting of animals previously out of range.

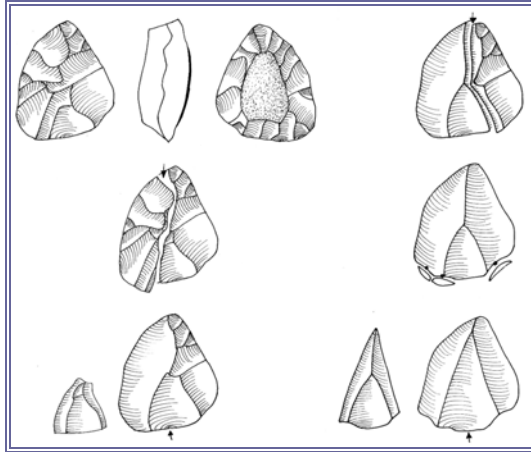


Figure 3. Nubian Levallois point (sequence from top left to bottom right).

Middle Palaeolithic scrapers are particularly varied (Bordes 1961), whether due to different tool industries made by different people or to varying seasonal activities at different sites. It is also possible that the basic shape and size of scrapers was originally more or less the same (Dibble 1984), and that many scraper types in fact represent different stages in a changing reduction continuum from blank to discarded tool.

Middle Palaeolithic lithic industries in Egypt share some features with the overall picture in North Africa, Europe, and Asia, especially the clear shift away from a bifacial core industry towards a flake/blade industry. Due to the lack of deeply stratified sites, the archaeological record of the Middle Palaeolithic still shows wide chronological gaps from site to site, which makes it difficult to paint a homogeneous picture of the period in Egypt. A few elements are specific to North Africa, like the tanged point for socket-hafting of the Aterian, a Levallois-based industry originally named after Bir el-Ater in Algeria and widespread across the Maghreb, the Sahara, and even south into Niger (Caton-Thompson 1946; Kleindienst 2001).

A late Middle Palaeolithic industry of the southern Nile Valley is known from Khor Musa near the Second Cataract (Marks 1968; Wendorf et al. 1979). It is a well-defined Levallois-based flake-industry in which denticulates and well-made burins played a major role, usually for specific work on bones or wood.

Many of the Middle Palaeolithic sites so far investigated in the Nile Valley are related to the exploitation of chert in the form of cobbles. One such site is Nazlet Khater 4, c. 30 km northwest of Sohag in Middle Egypt (Vermeersch, P.M. et al. 2002: 211 - 271). Nazlet Khater is thus far the oldest subterranean mining site in the world, with many extraction ditches, shafts, and galleries. While finds of human remains and artifacts of the Palaeolithic are very rare, it is from the very late Middle Palaeolithic that we have the first burial of a modern human in Egypt. Near Dendara in Middle Egypt, and in an area of chert mining activity, a child was buried about 55,000 years ago (Vermeersch, P.M.e.a. 1998). A long-used Middle Palaeolithic site with a fireplace with the burnt bones of buffalo and gazelle, as well as catfish and shell, is known from Sodmein Cave in the Eastern Desert (Van Peer et al. 1996).

### *The Upper Palaeolithic*

Due to the lack of a lithic sequence from the Middle to the Upper Palaeolithic, the transition to and the development of the material culture of the Upper Palaeolithic (40,000-35,000 BCE) in the Western Desert and the Nile Valley is still not well understood. Finds from the Dahkla oasis give evidence that the Western Desert was apparently not depopulated and no occupational hiatus existed during that time (Wiseman 2001). One of the very few Upper Palaeolithic sites known from the Nile Valley is the already-mentioned mining site at Nazlet Khater 4 in Middle Egypt. Altogether, the material remains of the Upper Palaeolithic are very scarce in Egypt and future research is needed in order to place the Nile Valley into

the wider scheme of the Upper Palaeolithic in northern Africa.

### *The Final Palaeolithic*

With climate change in the Final Palaeolithic in Egypt (25,000-7000 BCE), aquatic resources were increasingly exploited. Large mammals still complemented the diet, but fish, especially catfish (*Clarias*), clearly became one of the main staples, along with wetland tubers, particularly nut-grass tubers. Microlithic bladelet tools became common in most parts of Northern Africa (fig. 4). Backed bladelet tools are so standardized, non-varying, and consistent in their forms that it is assumed that they were made and used in face-to-face social contexts, playing a significant role in the social identity of the people who manipulated them (Close 2002). Small backed bladeletes, lunates, and triangulates were possibly used as part of composite pieces of equipment like harpoons or spears. With this new industry, a dramatic increase in the produced cutting edge of flint can be observed. For hundreds of thousands of years, the cutting edge gained from 1 kg of raw material remained under 10 m, but the amount of cutting edge now climbed to almost 100 m (Keefer 1993: 21).

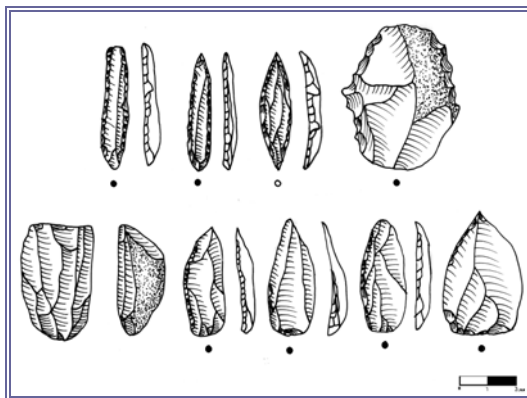


Figure 4. "Typical" Late Palaeolithic tools and core.

The most important site for this period lies at Wadi Kubbaniya north of Aswan (Wendorf et al. 1986-), with almost 30 locales of the Late Palaeolithic. The sites lie on sand dunes,

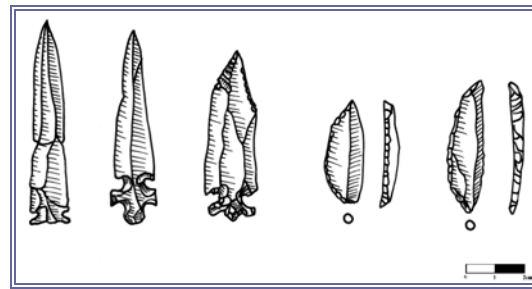


Figure 5. "Helwan points" and lunates (after Schmidt 1996b).

on the plains in front of the dunes, and on high areas near the mouth of the wadi. The chronological sequence between 25,000 and 11,000 BP shows a rather rapid change of material culture with different strategies of sustenance, all competing for the resources along the Nile Valley. This competition was due to high floods during the Holocene wet phase (12,000-8500 BP) in the valley, which were followed by a hyper-arid climate that also limited the living and exploitation space in the alluvial plain. This struggle for resources and the consequences of violent conflicts are well attested by the Wadi Kubbaniya skeleton of a man in his early twenties who was speared from behind (Wendorf and Schild 1986), and by the dozens of people who were killed and buried at Jebel Sahaba (Wendorf 1968a: 954 - 995).

### *The Epipalaeolithic*

The microlithic character of stone tool assemblages remained more or less intact during the Epipalaeolithic (7000-6000 BCE), but showed influences from the Levant (Schmidt 1996b). Tools from Helwan are dominated by scalene bladelet tools, backed triangles, and lunates with some so-called Helwan points (fig. 5) – an elongated projectile point with bilateral notches and a short tang. Retouch can cover the whole point, the tip, or just the hafting area. The majority of these points do not exactly resemble Egyptian points, and their likely origin is the Sinai and the southern Levant, with the best parallels from the Pre-Pottery Neolithic B. In the Fayum, the Epipalaeolithic is known as Qarunian or Fayum B, and dates



to approximately 8200-7200 BP (Brewer 1989; Wendorf and Schild 1976: 155 - 226). The lithic industry possesses a microlithic character based on backed or scalene bladelets, lunates, and triangles. The toolkit ranges from backed pieces (more than 50% of all the tools), notched and denticulated tools, geometrics, and some microburins, to a few endscrapers and even rarer perforators. In Upper Egypt, the campsites of Elkab (c. 8000 BP) yielded a lithic industry, the Elkabian, based on wadi pebbles and consisting mainly of bladelets as well as blade tools (Vermeersch 1970; 1978). Amongst the bladelet tools are backed pieces, lunates, notches, denticulates, and geometrics and microburins. At the Epipalaeolithic site at Tree Shelter in the Eastern Desert, approximately 25 km west of Quseir, hunter-gatherers already visited the place around 7000 BCE. Overall, their lithic industry is strikingly similar to the Elkabian and is characterized by the production of blades and bladelets (Vermeersch 2008: 89 - 94). Yet with respect to tools, endscrapers are rare at Elkab, while at Tree Shelter they account for the majority of tools, indicating hide preparation. Surprisingly, there was also a bifacial arrowhead among the stone tools at Tree Shelter, thus introducing bifacial flaking to this area (Vermeersch 2008: fig. 53.2). The lithic assemblages from the Eastern Desert and Elkab show similarities with sites in the Western Desert, where a similar bladelet technology can be found at sites such as E-72-5 in the Dyke area, and denticulated, notched pieces and microburins are common tool types (Schild and Wendorf 1977). This type of assemblage is also quite similar to the inventories associated with the "Early Neolithic" sites at el-Ghorab and Nabta Playa in the Western Desert (Wendorf and Schild 1998: 101 - 105).

#### *The Neolithic (6000-4500 BCE)*

There are several sites in the Western Desert of post-Palaeolithic date that had an important influence on the development of Predynastic stone tool technology. In the Dakhla oasis we find the Beshendi and Sheikh Muftah industries (McDonald 1993, 2003).

The former is a flake industry based on small flint nodules and quartzite. The inventories are characterized by many projectile points, up to 40% of all the tools, many of them bifacially retouched. There are also large bifacial tools present such as foliates and knives. Notched or denticulated pieces, scrapers, perforators, and side-blow flakes complement the tool kit. At Sheikh Muftah sites, imported tabular flint, which was often heat-treated, was the preferred raw material for perforators, scrapers, and denticulated pieces. There are fewer projectile points; a bifacial, tanged arrowhead is the major projectile form. Side-blow flakes, picks, sickles, and a few knives are present as well. Bifacial tools are also found in assemblages from the Farafra oasis (Barich et al. 1996). Calibrated dates for some sites are in the range of around 5900-6500 BCE. Many bifacial tools also come from Rohlfs Cave at Djara, where large, leaf-shaped, bifacial knives with fine, parallel ripples dominate the stone tool assemblages (Kuper 1996: figs. 3 - 4). Common elements at the sites listed above are projectile points and side-blow flakes. Many of the sites in the Western Desert share several Neolithic characteristics, such as pottery and grinding stones, as well as domesticated cattle and a lithic industry with bifacial tools, such as arrowheads, foliates, and knives (McDonald 1996). The Eastern Desert is by far less well explored in comparison to the Western Desert. During the Neolithic, herders came to the already- mentioned site of Tree Shelter, now bringing with them herds of sheep and goat (Linseele and van Neer 2008). Irregular visits to the site ended in approximately 3700 BCE. At the nearby site of Sodmein Cave, people also came to the area, bringing with them large herds of sheep/goat as well (Vermeersch et al. 1994).

Most of the Neolithic sites in the Nile Valley and the adjacent Fayum oasis cover the time span of the fifth millennium BC, with the Fayum A culture probably setting off the sequence in the second half of the sixth millennium BC. The lithic industry of Fayum A (Caton-Thompson and Gardner 1934) is generally characterized by a flake industry

with frequent denticulates, notched pieces, and retouched flakes. Also present are bifacial tools and scrapers on side-blow flakes. Axes often possess a polished working edge. The typical projectile point was the so-called bifacial “Fayum point” with a concave hollow base and long wings.

The site of Merimde Beni-Salame provides a sequence of almost 1000 years during the late 6<sup>th</sup> and first half of the fifth millennium BCE (Eiwanger 1984, 1988, 1992, 1999). The most ancient level is the so-called “Urschicht,” with a flake-blade industry using mainly light brown terrace pebbles. Dorsal retouching is common, while ventral retouches remained scarce, as did end retouching. Coarse tools are represented by scrapers on core caps and some bifacially retouched tools. Amongst the arrowheads, a small artifact stands out (Eiwanger 1984: pl. 57, I.1106). It was completely retouched on the dorsal, while the ventral shows only retouching at the tip and along the shaft. The projectile point has fins and two opposite notches on either margin, similar to the Epipalaeolithic Helwan points. The lithic industry of level II is of a very different character, dominated by bifacials (Eiwanger 1988: pls. 33 - 41). Amongst the various types of bifacials are perforators, sickles, and denticulates, with the latter two often bearing sickle sheen. Another group of bifacial tools are axes with polished cutting edges. A new form of projectile point had a triangular shape with straight ending wings, sometimes finely denticulated edges, and a concave base. Blades were still produced and turned into simple blade tools, but their length increased when compared to the Urschicht. The lithic industry of the youngest phase at Merimde (level III-V) can be seen as a continuation of the bifacial industry from level II. Flintknappers again made use of wadi pebbles, albeit on a small scale. The form of the triangular projectile point was becoming more clearly defined in level IV when it reaches the classical Merimde point for arrows and harpoons alike.

The lithic industry from el-Omari (Debono and Mortensen 1990), south of modern Cairo,

is based on flakes that overwhelmingly use the locally available, roughly fist-sized gravel flint, resulting in relatively small flakes, alongside a core industry for bifacial tools. The latter especially show similarities with Merimde Beni-Salame and the Fayum Neolithic. The main tool types are denticulated and notched pieces, perforators, various retouched pieces, scrapers, and a few sickle blades. A unique tool at el-Omari is the handled knife made on large blades (Debono and Mortensen 1990: 47 - 48, pls. 19.7 - 19.13, 20.1 - 20.3). Made from a grayish flint that was brought to the site in the form of blanks, they feature a steep retouching on the back and a cutting edge on the right and left margin. Microliths are another element at el-Omari reminiscent of an Epipalaeolithic tradition (Debono and Mortensen 1990: pl. 23 nos. 1 - 28). The polished axes from the later phase at el-Omari, however, point to a southern tradition from the Badari region. This late Neolithic industry in Upper Egypt was a flake-blade industry with various retouched pieces, drills, and endscrapers as the dominant tool types (Brunton and Caton-Thompson 1928: 35 - 37, pls. XXVIII and XXIX; Holmes 1989: 93 - 188). Concave-base projectile points are also similar to those from Lower Egypt, but are often more finely made. Knives, adzes, or fishtail knives were rare elements. Although the exact chronological position of the Badarian remains somewhat debated, it is clear that it gives the first evidence for agriculture in Upper Egypt, and that in the region it developed into the Naqada I culture, which is characterized, in regard to its lithic material, by the Mostagedda industry. All in all, the Badarian stone industry is not merely a rough core industry, but a flake-blade industry with increasing standardization of lithic implements.

### *The Predynastic*

With respect to Upper Egypt, a rather homogenous lithic tradition was once assumed, but based on studies by Diane L. Holmes (1989), this tradition was not as coherent as originally presumed, and today three major industries can be separated: the

Badari region, i.e. the Mostagedda industry, the Naqada region, and Hierakonpolis.

The Mostagedda industry, with finds from settlements and cemeteries, developed from its predecessor, the Badarian. The lithic industry was a flake-blade industry on single platform cores with a bladelet technology on heat-treated cores. The raw material is mostly beige, but also brown, and brown-banded. The tool kit contained various perforators, picks, retouched pieces, retouched tabular slabs, sickle stones, axes, and concave-base arrowheads. Over time, the demand for larger tools increased, and people started to mine flint in the limestone cliffs, as the desert cobbles did not deliver the quality or the size required. Larger, regular blades were produced by specialized flintknappers. Knives, axes, or so-called fishtail knives were, however, rare elements. The fishtail knives were made by highly skilled knappers as prestige objects to be carried only by the elite (Hikade 2003b) (fig. 6). They belong to the finest stone tools ever made in Egypt, as do ripple-flaked knives (fig. 7) (Kelterborn 1984; Midant-Reynes 1987). These delicate knives have, on one face, a retouching pattern that resembles ripples, while the opposite side remains purely polished. Only the area of the handle shows bifacial retouching. The cutting edge was often finished with an extremely fine denticulation. Although generally seen as characteristic of the fourth millennium BC, these prestige objects are actually very rare overall. Some flint knives of the late fourth millennium BCE could have amazing dimensions, such as the gigantic pieces from the Main Deposit at Hierakonpolis (Quibell 1900: pl. III) or the recently discovered 50 cm-long example found at Tell el-Farkha in the Nile delta (Ciałowicz et al. 2007: 28, fig. 36b).

The raw material of the Naqada lithic industry is overwhelmingly a beige flint from the higher slopes of the local wadis, with a few rare pieces made from silicified limestone or obsidian. The industry is a flake industry with relatively small flakes. Over time, larger and more regular blades were also made from

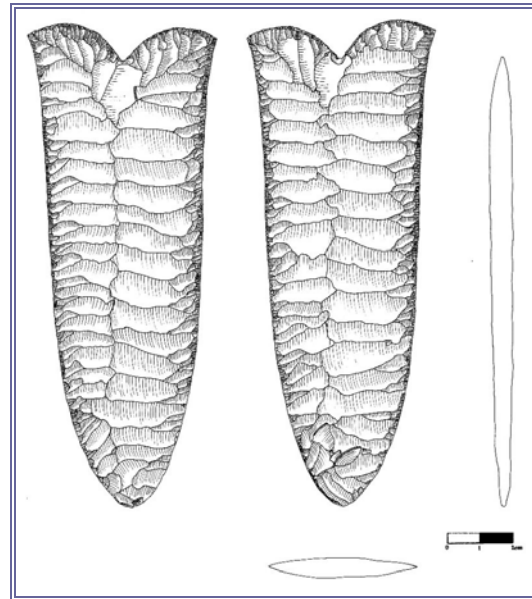


Figure 6. Fishtail knife from tomb U-127 from Cemetery U at Abydos.

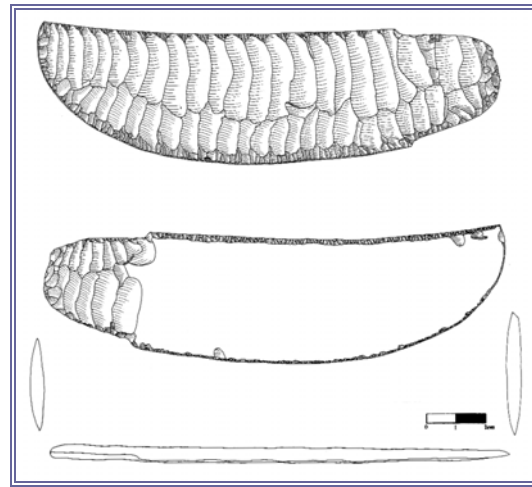


Figure 7. Ripple-flaked knife from tomb U-503 from Cemetery U at Abydos.

much larger cores. While the flake industry is the dominant technology in the settlement site, larger blades and bladelets, some from heat-treated cores, and tools thereof, dominate the collections from the cemeteries. The main non-bifacial tool categories are burins, notched or denticulated pieces, truncations, sickle blades, end- and sidescrapers, small and larger perforators, and various other retouched implements.



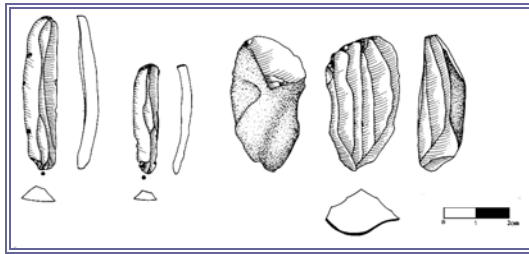


Figure 8. Micro endscraper and bladelet core from Maadi.

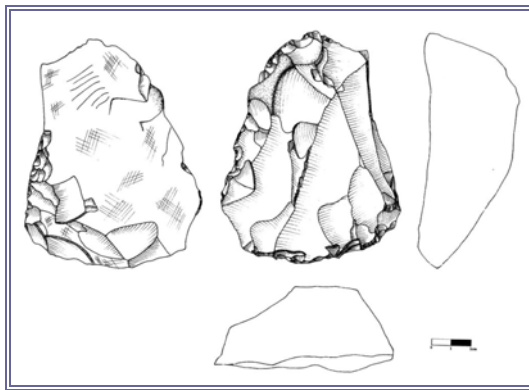


Figure 9. Flint axe from Maadi.

The lithic industry at Hierakonpolis is a combination of a flake industry, a distinct blade technology, and a glossy bladelet technology (Holmes 1989: 284 - 321). Flake technology dominates the earlier assemblages, while larger regular blades indicate developments during the Naqada II period, showing a uniting element in the lithic assemblages throughout the Nile Valley. A special segment of stone tool production comes from HK29A, known as the first ceremonial building in Egypt and often referred to as the ancient National Shrine of Upper Egypt (Holmes 1992). Here, bifacial thinning flakes indicate the production of bifacial tools, and an abundance of microdrills points to the manufacture of stone beads. A new element of flintknapping, clearly showing the outstanding craftsmanship of the time, is the production of flint artifacts in the shape of animals. Made by pressure flaking, the range of animals encompasses wild animals such as hippopotamus (fig. 12) and ibex, but also cows, goats, and even dogs. These artifacts probably functioned as votive offerings

(Friedman 2005, 2007). So far, approximately 60 animal figures in flint are known, the provenanced ones mostly from Hierakonpolis, thus it seems that we are dealing with a Hierakonpolis specialty (Friedman 2000: 14, 17).

At the site of Adaima about 20 km north of Hierakonpolis we can observe the dichotomy of a local and non-local lithic industry quite typical for Predynastic Egypt (Briois 2000, 2001, 2002; Briois and Landier 2003; Briois and Midant-Reynes 2008; Briois et al. 2004; Midant-Reynes and Prost 2002). The local industry is characterized by the use of locally available pebbles for overwhelmingly expedient tools such as scrapers, borers, or denticulated pieces made on the spot (Briois and Midant-Reynes 2008: fig. 4). All stages of the production sequence can be found in the lithic assemblage for this industry at Adaima. The non-local lithic industry comprised finished bifacial knives and regular blades sometimes used as blanks for sickle blades which had been made by specialized craftsmen and brought to the settlement (Briois and Midant-Reynes 2008: figs. 5 and 6).

At the onset of the fourth millennium BC, we can observe a sophisticated blade and bladelet industry in the north of Egypt. In this so-called Maadi/Buto culture, larger blades were often retouched to make perforators, backed pieces, and end-scrapers (Schmidt 1993, 1996a). At the site of Maadi, a particularly rich assemblage can be studied (Caneva et al. 1989; Hikade 2003a; Rizkana and Seeher 1988). Small bladelets, often with a twisted long axis, were struck from small cores and often turned into micro-endscrapers (fig. 8). Another dominant tool type is the burin, mostly made on existing tools that were altered to make an implement for carving wood, bones, and possibly also for drilling holes in materials such as leather. Bifacials are generally rare at Maadi. Until recently, it was believed that copper replaced flint for larger tools at Maadi. This assumption was based on a lack of heavy stone tools from older excavations. However, one recently excavated

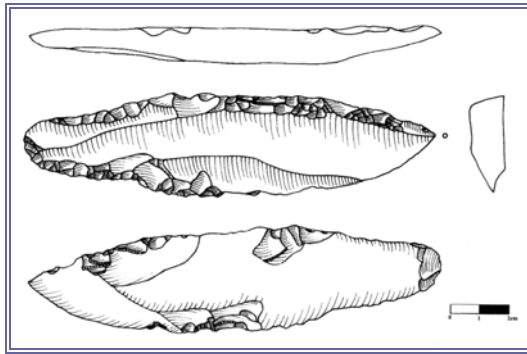


Figure 10. Upper Egyptian Hemmamije knife found at Maadi.

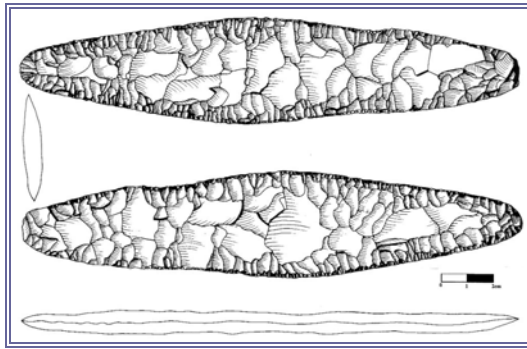


Figure 11. Upper Egyptian rhomboid flint knife found at Maadi.

flint ax (fig. 9) shows that copper had not replaced flint entirely (Hikade 2003a). Upper Egyptian knives of the type Hemmamije (fig. 10), bifacial rhomboid (fig. 11), and fishtail knives at Maadi show contact with the south. Two more groups can be considered imports from outside Egypt: the so-called Canaanite blades, which are large regular harvesting tools, and the circular or tabular scrapers (Schmidt 1984). Together with the foreign underground dwellings, these are clear indications that Maadi was part of a larger trading and exchange network and acted as the entrepôt to Egypt.

In light of all of the tool categories, we should not forget that for all lithic cultures of the Predynastic, a large number of *ad hoc* or expedient tools, which defy any categorization, supplemented the stone tool kit.

It is after this long – in some parts diverse, and in others quite similar – development of



Figure 12. Flint hippopotamus from Hierakonpolis (c. 10 cm long).

the lithic industries from the seventh to fourth millennium BCE that finally, with the end of the fourth millennium BCE, and then in particular during the Early Dynastic Period, we see an increasing standardization of Egyptian knapped stone tools.

### *Dynastic Egypt*

The trend towards standardization continued in the Early Dynastic Period (3030-2650 BCE). At Helwan, finds were discovered from a flint workshop that obviously specialized in the production of large bifacial knives (Hikade 1999), sometimes of enormous dimensions. One such knife, probably used by King Djoser or a high priest during the burial of King Khasekhemwy at Abydos, was 72 cm long (Hikade 1997). Large bifacial knives were manufactured in special workshops either in settlements, e.g., at Buto (Kindermann 2008), or next to cemeteries, as evidenced at Helwan (Hikade 1999). The use of flint knives is depicted in many slaughtering scenes in the Old Kingdom tombs of Giza and Saqqara. The mastaba of Ptahhotep serves as a good example (de Garis Davies 1901: pl. XXIII), showing butchers cutting off the legs of cattle with large knives. In the lower register of this wall scene, at the left and in the middle of the upper register, a man is shown resharpening (Egyptian *pdt*) a used knife with a retouching stick.

One of the most common tool types of the Early Dynastic Period down to the end of the 4<sup>th</sup> Dynasty is the once so-called “razor blade” (Reisner 1927: 26), which is, in fact, a bi-truncated tool on a very regular, large blade.

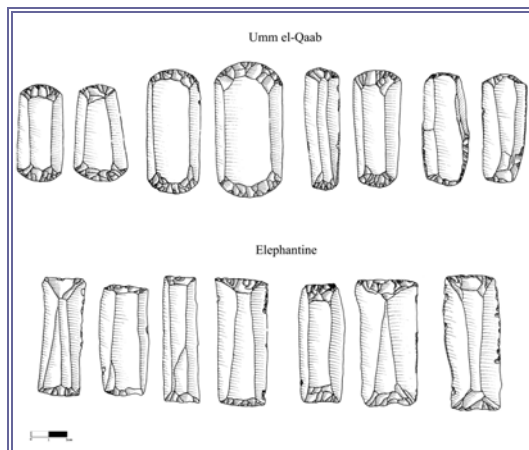


Figure 13. Sequence of regular, bi-truncated blade tools from Umm el-Qaab (1<sup>st</sup> Dynasty) and Elephantine Island (2<sup>nd</sup> to 5<sup>th</sup> Dynasty).

The early forms of the 1<sup>st</sup> Dynasty were oval in shape, becoming rectangular from the 2<sup>nd</sup> Dynasty onwards (fig. 13). The tool was used throughout the country and was supplied by specialized workshops. On the island of Elephantine, it is so common that it makes up one third of all tools dating to the Early Dynastic Period and the early Old Kingdom, and it was possibly as multi-functional as a Swiss Army Knife (Hikade 2002).

Larger, Old Kingdom assemblages of knapped stone tools were also discovered at Giza (Conard 2000; Kromer 1978), and the importance of the flint sickle for the agrarian society of ancient Egypt is mirrored at sites such as Kom el-Hisn (Wenke et al. 1988). From Ain Asil in the Dakhla oasis comes an assemblage from the second half of the third

millennium BCE that features a high amount of scrapers, indicating a special task such as hide processing (Midant-Reynes 1998). The use of flint tools continued throughout the second millennium BCE as the raw material was cheap and plentiful and thus more affordable and accessible than metal. The tomb of the nomarch Amenemhet at Beni Hasan (BH2) of the 12<sup>th</sup> Dynasty (Griffith 1896: 33 - 38, pls. VII - X; Newberry 1893: 31, pl. XI) has a scene showing the mass production of flint knives by men (Lundt 2008). In wall decoration, the shape of the knives of the Old Kingdom, the First Intermediate Period, and Middle Kingdom look very similar. They have a straight back and a convex cutting edge. However, in most cases the handles were more elaborate in the Old Kingdom (Hikade and Van Haarlem 2006).

A fine lithic sequence from the Middle to the New Kingdoms can be studied at the sites of Tell el-Daba and Qantir in the eastern Nile Delta (Tillmann 1986, 1992). Lithic assemblages are also known from the New Kingdom capital at Tell el-Amarna (Miller 1987). Right down to the first millennium BCE, flint was used as a raw material for implements such as arrowheads. The finds in the royal tombs at el-Kurru (Dunham 1950: 13 - 18, pl. LXXIc) are a good example of this.

The specialized craftsmanship of flintknapping probably came to an end in the first millennium BCE.

## Bibliographic Notes

For a very good introduction to flintknapping in general see Whittaker (1994). A comprehensive work on stone tool assemblages for Prehistoric and Pharaonic Egypt is still a *desiderata*, and thus the reader has to refer to various site reports and articles. For a brief overview of Prehistoric Egypt see Hendricks and Vermeersch (2000); for a more extensive work, see the monograph by Midant-Reynes (2000). For the Lower Palaeolithic see also the earlier work by Caton-Thompson and Gardner (1934), which provides a wide range of illustrations of Old Stone Age tools, as well as the summary given by J.D. Clark (1992). F. Wendorf (1968b), and the studies by P.M. Vermeersch and his team (1970, 1978, 1992, 1994, 1998, 2000, 2002) are essential for the Middle and Upper Palaeolithic. The site at Wadi Kubbania (Wendorf et al. 1986-) is the key site that provides the chronological sequence for the time between c. 22,000-11,000 BP and its associated

lithic industries. A survey of the transition phase from the Middle and Upper Palaeolithic to the Epipalaeolithic of Egypt in the broader framework of northern and eastern Africa is provided by P.M. Vermeersch (1992). The interaction between the people of the Western Desert and the Nile Valley, as well as the history of research in the Western Desert from 1850 onwards, are summarized by R. Kuper (2002). The archaeological sequence of a fully Neolithic settlement in Lower Egypt is covered in detail by Eiwanger's work at Merimde (Eiwanger 1984, 1988, 1992), which can be supplemented by material from the recently studied stone tools from el-Omari (Debono and Mortensen 1990). For the fourth millennium BC, an early study of stone tools by Huzzayin (1937) on material from Armant was one of the first detailed studies, but the seminal study by Holmes (1989) is crucial. Her studies have shown the various differences between tool assemblages from throughout Upper Egypt that only became more homogenous at the very end of the Predynastic. A comprehensive study of lithic industries for the Dynastic Period is still lacking.

## References

- Barich, Barbara E., Fekri A. Hassan, and Alessandra A. Stoppiello  
1996 Farafra Oasis between the Sahara and the Nile. In *Interregional contacts in the later prehistory of northeastern Africa*, Studies in African Archaeology 5, ed. Lech Krzyżaniak, Karla Kroeper, and Michał Kobusiewicz, pp. 71 - 79. Poznań: Poznań Archaeological Museum.
- Bordes, François  
1961 *Typologie du paléolithique ancien et moyen*. 2 vols. Publications de l'Institut de préhistoire de l'Université de Bordeaux. Mémoire 1. Bordeaux: Delmas.
- Bovier-Lapierre, Pere  
1926 Les Gisements Paléolithiques de la Plaine de l'Abbasieh. *Bulletin de l'Institut d'Égypte* 8, pp. 257 - 275.
- Brewer, Douglas J.  
1989 *Fishermen, hunters, and herders: Zooarchaeology in the Fayum, Egypt (ca. 8200-5000 bp)*. British Archaeological Reports International Series 478. Oxford: B.A.R.
- Briais, François  
2000 Les industries lithiques d' Adaïma. Étude des matériaux de 1997-1999. *Bulletin de l'Institut français d'archéologie orientale* 100, pp. 462 - 465.  
2001 Adaïma. L'industrie lithique. *Bulletin de l'Institut français d'archéologie orientale* 101, pp. 474 - 479.  
2002 Adaïma. L'industrie lithique. *Bulletin de l'Institut français d'archéologie orientale* 102, pp. 457 - 461.
- Briais, François, and Guilhem Landier  
2003 Adaïma. L'industrie lithique. *Bulletin de l'Institut français d'archéologie orientale* 103, pp. 505 - 509.
- Briais, François, and Beatrix Midant-Reynes  
2008 Lithic industries from Adaïma: Between farmers and craftsmen. In *Egypt at its origins 2: Proceedings of the international conference "Origin of the State. Predynastic and Early Dynastic Egypt," Toulouse (France), 5th - 8th September 2005*, Orientalia Lovaniensia Analecta 172, ed. Beatrix Midant-Reynes, and Yann Tristant, pp. 21 - 31. Leuven: Peeters.
- Briais, François, Guilhem Landier, and Jean-Pierre Delage  
2004 Adaïma. L'industrie lithique. *Bulletin de l'Institut français d'archéologie orientale* 104, pp. 604 - 607.
- Brunton, Guy, and Gertrude Caton-Thompson  
1928 *The Badarian civilisation and Predynastic remains near Badari*. British School of Archaeology in Egypt Publications 46. London: British School of Archaeology in Egypt.

Butzer, Karl W.

- 1980 Pleistocene history of the Nile Valley in Egypt and Lower Nubia. In *The Sahara and the Nile: Quaternary environments and prehistoric occupation in northern Africa*, ed. Martin A. J. Williams Williams, and Hugues Faure, pp. 253 - 280. Rotterdam: Balkema.

Caneva, Isabella, Marcella Frangipane, and Alba Palmieri

- 1989 Recent excavations at Maadi (Egypt). In *Late prehistory of the Nile Basin and the Sahara*, Studies in African Archaeology 2, ed. Lech Krzyżaniak, and Michał Kobusiewicz, pp. 287 - 293. Poznań: Poznań Archaeological Museum.

Caton-Thompson, Gertrude

- 1946 The Aterian industry: Its place and significance in the Palaeolithic world. *Journal of the Royal Anthropological Institute of Great Britain and Ireland* 76(2), pp. 87 - 130.  
1952 *Kharga Oasis in Prehistory*. London: University of London.

Caton-Thompson, Gertrude, and Elinor Gardner

- 1934 *The desert Fayum*. London: The Royal Anthropological Institute of Great Britain and Ireland.

Ciałowicz, Krzysztof, Robert Słaboński, and Joanna Dębowska

- 2007 *Kość i złoto: początki sztuki egipskiej: z wykopalisk Instytutu Archeologii Uniwersytetu Jagiellońskiego i Muzeum Archeologicznego w Poznaniu*. Poznań: Poznańskie Towarzystwo Prehistoryczne.

Clark, J. Desmond

- 1992 The Earlier Stone Age/Lower Paleolithic in North Africa and the Sahara. In *New light on the Northeast African past: Current prehistoric research: Contributions to a symposium, Cologne 1990*, Africa Praehistorica 5, ed. Frank Klees, and Rudolph Kuper, pp. 17 - 37. Köln: Heinrich-Barth-Institut.

Close, Angela E.

- 2002 Backed bladelets are a foreign country. In *Thinking small: Global perspectives on microlithization*, Archeological Papers of the American Anthropological Association 12, ed. Robert G. Elston, and Steven L. Kuhn, pp. 31 - 44. Arlington, VA: American Anthropological Association.

Conard, Nicholas J.

- 2000 Flint artifacts from the 1988/89 excavation at Giza. *Mitteilungen des Deutschen Archäologischen Instituts, Abteilung Kairo* 56, pp. 21 - 42.

de Garis Davies, Norman

- 1901 *The mastaba of Ptahbetep and Akhethetep at Saqqarah II: The mastaba*. Archaeological Survey of Egypt 9th Memoir. London: Egypt Exploration Fund.

Debono, Fernand, and Bodil Mortensen

- 1990 *El Omari: A Neolithic settlement and other sites in the vicinity of Wadi Hof, Helwan*. Archäologische Veröffentlichungen 82. Mainz am Rhein: Philipp von Zabern.

Dibble, Harold L.

- 1984 Interpreting variation of Middle Palaeolithic scrapers: Function, style, or sequence of reduction. *Journal of Field Archaeology* 11, pp. 431 - 436.

Dunham, Dows

- 1950 *The royal cemeteries of Kush I: El Kurru*. Cambridge, MA: Harvard University Press.

Eiwanger, Josef

- 1984 *Merimde-Benisalame I: Die Funde der Urschicht*. Archäologische Veröffentlichungen 47. Mainz am Rhein: Philipp von Zabern.  
1988 *Merimde-Benisalame II: Die Funde der mittleren Merimdekultur*. Archäologische Veröffentlichungen 51. Mainz am Rhein: Philipp von Zabern.  
1992 *Merimde-Benisalame III: Die Funde der jüngeren Merimdekultur*. Archäologische Veröffentlichungen 59. Mainz am Rhein: Philipp von Zabern.  
1999 Merimde Benisalame. In *The encyclopedia of the archaeology of ancient Egypt*, ed. Kathryn A. Bard, pp. 501 - 505. London: Routledge.



Friedman, Renée

- 2000 Figures in flint. *Nekhen News* 12, pp. 14 - 17.
- 2005 Excavating Egypt's early kings. *Nekhen News* 17, pp. 4 - 6.
- 2007 The columned hall at HK6 and other wonders. *Nekhen News* 19, pp. 7 - 9.

Griffith, Francis Llewelyn

- 1896 *Beni Hasan: Part III*. Archaeological Survey of Egypt 5th Memoir. London: Egypt Exploration Fund.

Hendrickx, Stan, and Pierre Vermeersch

- 2000 Prehistory: From the Palaeolithic to the Badarian culture. In *The Oxford history of ancient Egypt*, ed. Ian Shaw, pp. 16 - 40. Oxford: Oxford University Press.

Hikade, Thomas

- 1997 Ein außergewöhnliches Silexmesser aus Abydos. *Mitteilungen des Deutschen Archäologischen Instituts, Abteilung Kairo* 53, pp. 85 - 89.
- 1999 An Early Dynastic flint workshop at Helwan, Egypt. *Bulletin of the Australian Centre for Egyptology* 10, pp. 47 - 57.
- 2002 Die lithischen Industrien des Alten Reiches auf Elephantine. *Mitteilungen des Deutschen Archäologischen Instituts, Abteilung Kairo* 58, pp. 305 - 322.
- 2003a Die Lithik. *Mitteilungen des Deutschen Archäologischen Instituts, Abteilung Kairo* 59, pp. 180 - 186.
- 2003b Getting the ritual right - fishtail knives in Predynastic Egypt. In *Egypt - temple of the whole world: Studies in honour of Jan Assmann*, Studies in the History of Religions 97, ed. Sibylle Meyer, pp. 137 - 151. Leiden and Boston: Brill.

Hikade, Thomas, and Willem Van Haarlem

- 2006 Recent results of research at Tell Ibrahim Awad. In *imelines: Studies in honour of Manfred Bietak*, Orientalia Lovaniensia Analecta 149, ed. Ernst Czerny, Irmgard Hein, Hermann Hunger, Dagmar Melman, and Angela Schwab, pp. 385 - 394. Leuven: Peeters.

Holmes, Diane L.

- 1989 *The Predynastic lithic industries of Upper and Lower Egypt. A comparative study of the lithic traditions of Badari, Nagada and Hierakonpolis*. 2 vols. British Archaeological Reports International Series 469; Cambridge Monographs in African Archaeology 33. Oxford: B.A.R.

Huzzayin, Suliman

- 1937 The flint industry. In *Cemeteries of Armant I*, Memoir of the Egypt Exploration Society 42, ed. Sir Robert Mond, and Oliver Humphrys Myers. London: Egypt Exploration Society.

Keefer, Erwin

- 1993 *Steinzeit*. Sammlungen des Württembergischen Landesmuseums Stuttgart 1. Stuttgart: Theiss.

Kelterborn, Peter

- 1984 Towards replicating Egyptian Predynastic flint knives. *Journal of Archaeological Science* 11, pp. 433 - 453.

Kindermann, Karin

- 2008 Lithic technology and production sequences: Recent investigations from Tell el-Farai'n/Buto. In *Abstracts of papers presented at the third international colloquium on Predynastic and Early Dynastic Egypt*, ed. Renée Friedman, and Liam McNamara, p. 118. London: British Museum.

Kleindienst, Maxine R.

- 2001 What is the Aterian? The view from Dakhleh Oasis and the Western Desert, Egypt. In *The oasis papers 1: The proceedings of the first conference of the Dakhleh Oasis Project*, Monograph (Dakhleh Oasis Project) 6, ed. C.A. Marlow, and A.J. Mills, pp. 1 - 14. Oxford: Oxbow Books.

Kromer, Karl

- 1978 *Siedlungsfunde aus dem frühen alten Reich in Gizeh: Österreichische Ausgrabungen 1971-1975*. Denkschriften (Österreichische Akademie der Wissenschaften. Philosophisch-Historische Klasse) 136. Vienna: Verlag der Österreichischen Akademie der Wissenschaft.

Kuper, Rudolph

- 1996 Between the oases and the Nile – Djara: Rohlf's Cave in the Western Desert. In *Interregional contacts in the later prehistory of northeastern Africa*, Studies in African Archaeology 5, ed. Lech Krzyżaniak, Karla Kroeper, and Michał Kobusiewicz, pp. 81 - 91. Poznań: Poznań Archaeological Museum.
- 2002 Routes and roots in Egypt's Western Desert: The early Holocene resettlement of the eastern Sahara. In *Egypt and Nubia: Gifts of the desert*, ed. Renée Friedman, pp. 1 - 12. London: British Museum Press.

Linseele, Veerle, and Wim van Neer

- 2008 Faunal remains from the Tree Shelter Site. In *A Holocene prehistoric sequence in the Egyptian Red Sea area: The Tree Shelter*, Egyptian Prehistory Monographs 7, ed. Paul M. Vermeersch, pp. 79 - 84. Leuven: University Press.

Lundt, Marquardt

- 2008 Egyptian flint work, Part I. *Chips* 20(3), pp. 4 - 13.

Marks, Anthony

- 1968 The Khormusan: An Upper Pleistocene industry in the Nile Valley. In *The prehistory of Nubia*, ed. Fred Wendorf, pp. 315 - 391. Taos, NM: Fort Burgwin Research Center; Dallas: Southern Methodist University Press.

McDonald, Mary M.A.

- 1993 Cultural adaptations in Dakhleh Oasis, Egypt, in the Early to Mid-Holocene. In *Environmental change and human culture in the Nile Basin and northern Africa until the second millennium BC*, Studies in African Archaeology 4, ed. Lech Krzyżaniak, Michał Kobusiewicz, and John Alexander, pp. 199 - 209. Poznań: Poznań Archaeological Museum.
- 1996 Relations between Dakhleh oasis and the Nile Valley. In *Interregional contacts in the later prehistory of northeastern Africa*, Studies in African Archaeology 5, ed. Lech Krzyżaniak, Karla Kroeper, and Michał Kobusiewicz, pp. 93 - 99. Poznań: Poznań Archaeological Museum.
- 2003 Dakhleh Oasis in Predynastic and Early Dynastic times: Bashendi B and the Sheikh Muftah cultural units. *Archéo-Nil* 12, pp. 109 - 120.

Midant-Reynes, Béatrix

- 1987 Contribution à l'étude de la société prédynastique: Le cas du coteau "ripple-flake". *Studien zur Altägyptischen Kultur* 14, pp. 185 - 224.
- 1998 *Le silex de 'Ayn-Asil, oasis de Dakbla*, Balat Documents de fouilles 34. Cairo: Institut français d'archéologie orientale.
- 2000 *The prehistory of Egypt from the first Egyptians to the first pharaohs*. Translated by Ian Shaw. Oxford and Malden, MA: Blackwell Publishers.

Midant-Reynes, Béatrix, and Dominique Prost

- 2002 Le matériel lithique. In *Adaïma 1. Economie et habitat*, Fouilles de l'Institut français d'archéologie orientale du Caire 45, ed. Beatrix Midant-Reynes, and Nathalie Buchez. Cairo: Institut français d'archéologie orientale.

Miller, Robert

- 1987 Flaked stone from the Workmen's Village. In *Amarna Reports IV*, Occasional Publications 4, ed. Barry J. Kemp, pp. 144 - 153. London: Egypt Exploration Society.

Morgan, Jacques de

- 1897 *Recherches sur les origines de l'Égypte: Ethnographie préhistorique et tombeau royal de Nagadeh*. Paris: E. Leroux.

Newberry, Percy Edward

- 1893 *Beni Hassan: Part I*. Archaeological Survey of Egypt 1st Memoir. London: Kegan Paul, Trench, Trübner.

Pitt Rivers, Augustus Henry Lane-Fox

- 1882 On the discovery of chert implements in stratified gravel in the Nile Valley, near Thebes. *Journal of the Royal Anthropological Institute* 11, pp. 382 - 400.

- Quibell, James E.  
1900 *Hierakonpolis*. Part 1. Egyptian Research Account Memoir 4. London: Bernard Quaritch.
- Reisner, George A.  
1927 Hetep-heres, mother of Cheops. *Bulletin of the Museum of Fine Arts, Special Supplement* 25, pp. 1 - 36.
- Rizkana, Ibrahim, and Jürgen Secher  
1988 *Maadi II: The lithic industries of the Predynastic settlement*. Archäologische Veröffentlichungen 65. Mainz am Rhein: Philipp von Zabern.
- Sandford, Kenneth S.  
1934 *Paleolithic man and the Nile Valley in Upper and Middle Egypt: A study of the region during Pliocene and Pleistocene times*. Oriental Institute Publications 18. Chicago: The University of Chicago Press.
- Sandford, Kenneth S., and William J. Arkell  
1939 *Paleolithic man and the Nile Valley in Lower Egypt, with some notes upon a part of the Red Sea littoral: A study of the regions during Pliocene and Pleistocene times*. Oriental Institute Publications 46. Chicago: The University of Chicago Press.
- Schild, Romuald, and Fred Wendorf  
1977 *The prehistory of Dakbla Oasis and adjacent desert*. Wrocław: Zakład Narodowy im. Ossolińskich.
- Schmidt, Klaus  
1984 Zur Frage der ökonomischen Grundlagen frühbronzezeitlicher Siedlungen im Südsinai. Herstellung und Verhandlung von Plattensilexabschlaggeräten. *Mitteilungen des Deutschen Archäologischen Instituts, Abteilung Kairo* 40, pp. 261 - 264.  
1993 Comments to the lithic industry of the Buto-Maadi culture in Lower Egypt. In *Environmental change and human culture in the Nile Basin and northern Africa until the second millennium B.C.*, Studies in African Archaeology 4, ed. Lech Krzyżaniak, Michał Kobusiewicz, and John Alexander, pp. 267 - 277. Poznań: Poznań Archaeological Museum.  
1996a Lower and Upper Egypt in the Chalcolithic: The evidence of the lithic industries. In *Interregional contacts in the later prehistory of northeastern Africa*, Studies in African Archaeology 5, ed. Lech Krzyżaniak, Karla Kroeper, and Michał Kobusiewicz, pp. 279 - 289. Poznań: Poznań Archaeological Museum.  
1996b Helwan in Egypt: A PPN site? . In *Neolithic chipped stone industries of the Fertile Crescent, and their contemporaries in adjacent regions: Proceedings of the Second Workshop on PPN Chipped Lithic Industries, Institute of Archaeology, Warsaw University, 3rd-7th April 1995*, Studies in Early Near Eastern Production, Subsistence, and Environment 3, ed. Stefan Karol Kozłowski, and Hans Georg Gebel, pp. 127 - 135. Berlin: Ex Oriente.
- Schweinfurth, Georg A.  
1902 Kiesel-Artefacte in der diluvialen Schotter-Terrasse und auf den Plateau-Höhen von Theben. *Zeitschrift für Ethnologie* 34, pp. 293 - 310.  
1903 Steinzeitliche Forschungen in Oberägypten. *Zeitschrift für Ethnologie* 35, pp. 798 - 822.
- Seton-Karr, Henry W.  
1904 Fayoom Flint Implements. *Annales du Service des Antiquités d'Égypte* 4, pp. 145 - 186.
- Tillmann, Andreas  
1986 Ein Steingeräteinventar des Neuen Reiches aus Qantir/Piramesse (Ägypten). *Archäologisches Korrespondenzblatt* 16, pp. 149 - 155.  
1992 Die Steinartefakte des dynastischen Ägypten, dargestellt am Beispiel der Inventare aus Tell el-Dab'a und Qantir. PhD dissertation, University of Tübingen, Germany.
- Van Peer, Phillip, Paul M. Vermeersch, Jan Moeyersons, and Wim Van Neer  
1996 The Palaeolithic sequence at Sodmein Cave, Red Sea Mountains, Egypt. In *Aspects of African archaeology: Papers from the 10th Congress of the Pan-African Association for Prehistory and Related Studies*, ed. Gilbert Pwiti, and Robert Soper, pp. 149 - 156. Harare: University of Zimbabwe Publications.

- Vermeersch, Paul M.  
 1970 L'Elkabien: Une nouvelle industrie épipaléolithique à Elkab en Haute Égypte: sa stratigraphie, sa typologie. *Chronique d'Égypte* 89, pp. 45 - 67.  
 1992 The Upper and Late Palaeolithic of northern and eastern Africa. In *New light on the Northeast African past: Current prehistoric research: Contributions to a symposium, Cologne 1990*, ed. Frank Klees, and Rudolph Kuper, pp. 99 - 153. Köln: Heinrich-Barth-Institut.  
 2008 *A Holocene prehistoric sequence in the Egyptian Red Sea area: The Tree Shelter*. Egyptian Prehistory Monographs 7. Leuven: Leuven University Press.
- Vermeersch, Paul M., G. Gijssels, and Étienne Paulissen  
 2000 Acheulean at Nag Ahmed El Khalifa. In *Palaeolithic living sites in Upper and Middle Egypt*, Egyptian Prehistory Monographs 2, ed. Paul M. Vermeersch, pp. 57 - 73. Leuven: Leuven University Press.
- Vermeersch, Paul M., Étienne Paulissen, and Tim Vanderbeken  
 2002 Nazlet Kahter 4, an Upper Palaeolithic underground chert mine. In *Palaeolithic quarrying sites in Upper and Middle Egypt*, Egyptian Prehistory Monographs 4, ed. Paul M. Vermeersch, pp. 211 - 271. Leuven: Leuven University Press.
- Vermeersch, Paul M., Phillip van Peer, Jan Moeyersons, and Wim van Neer  
 1994 Sodmein Cave site, Red Sea mountains (Egypt). *Sahara* 6, pp. 31 - 40.
- Vermeersch, Paul M. et al.  
 1998 A Middle Palaeolithic burial of a modern human at Taramsa Hill, Egypt. *Antiquity* 72, pp. 475 - 484.
- Vermeersch, Pierre  
 1978 *L'Elkabien: Épipaléolithique de la Vallée du Nil égyptien*. Brussels: Fondation Égyptologique Reine Elisabeth; Leuven: Universitaire Pers.
- Wendorf, Fred  
 1968a Site 117: A Nubian Final Paleolithic graveyard near Jebel Sahaba, Sudan. In *The prehistory of Nubia*, Vol. 2, ed. Fred Wendorf, pp. 954 - 995. Taos, NM: Fort Burgwin Research Center; Dallas: Southern Methodist University Press.  
 1968b *The prehistory of Nubia*. Vol. 2. Taos, NM: Fort Burgwin Research Center; Dallas: Southern Methodist University Press.
- Wendorf, Fred, and Romuald Schild  
 1976 *Prehistory of the Nile Valley*. New York: Academic Press.  
 1986 *The Wadi Kubbania skeleton: A Late Paleolithic burial from southern Egypt*. Dallas: Southern Methodist University Press.  
 1992 The Middle Palaeolithic of North Africa. In *New light on the Northeast African past: Current prehistoric research: Contributions to a symposium, Cologne 1990*, Africa Praehistorica 5, ed. Frank Klees, and Rudolph Kuper, pp. 39 - 78. Köln: Heinrich-Barth-Institut.  
 1998 Nabta Playa and its role in Northeastern African prehistory. *Journal of Anthropological Archaeology* 17(2), pp. 97 - 123.
- Wendorf, Fred, Romuald Schild, and Herbert Haas  
 1979 A new radiocarbon chronology for Prehistoric sites in Nubia. *Journal of Field Archaeology* 6(2), pp. 219 - 223.
- Wendorf, Fred, Romuald Schild, and Angela E. Close  
 1986- *The prehistory of Wadi Kubbania*. (3 volumes: 1986 - 1989). Dallas: Southern Methodist University Press.  
 1993 *Egypt during the last interglacial: The Middle Paleolithic of Bir Tarfawi and Bir Sahara East* New York: Plenum Press.
- Wenke, Robert, Paul E. Buck, Hany A. Hamroush, Michal Kobusiewicz, Karla Kroeper, and Richard W. Redding  
 1988 Kom el-Hisn: Excavation of an Old Kingdom settlement in the Egyptian Delta. *Journal of the American Research Center in Egypt* 25, pp. 5 - 34.

Whittaker, John C.

1994 *Flintknapping: Making and understanding stone tools*. Austin: University of Texas Press.

Wiseman, Marcia F.

2001 Problems in the Prehistory of the Late Upper Pleistocene of the Dakhleh Oasis. In *The oasis papers 1: The proceedings of the first conference of the Dakhleh Oasis Project*, Monograph (Dakhleh Oasis Project) 6, ed. C.A. Marlow, and A.J. Mills, pp. 15 - 25. Oxford: Oxbow Books.

## *Image Credits*

Figure 1. Making a bifacial hand axe. (Illustration by the author.)

Figure 2. Levallois flake and point. (Illustration by the author.)

Figure 3. Nubian Levallois point (sequence from top left to bottom right). (Illustration by the author.)

Figure 4. “Typical” Late Palaeolithic tools and core. (Illustration by the author.)

Figure 5. “Helwan points” and lunates (after Schmidt 1996b). (Illustration by the author.)

Figure 6. Fishtail knife from tomb U-127 from Cemetery U at Abydos. (Illustration by the author.)

Figure 7. Ripple-flaked knife from tomb U-503 from Cemetery U at Abydos. (Illustration by the author.)

Figure 8. Micro endscraper and bladelet core from Maadi. (Illustration by the author.)

Figure 9. Flint axe from Maadi. (Illustration by the author.)

Figure 10. Upper Egyptian Hemmamijje knife found at Maadi. (Illustration by the author.)

Figure 11. Upper Egyptian rhomboid flint knife found at Maadi. (Illustration by the author.)

Figure 12. Flint hippopotamus from Hierakonpolis (c. 10 cm long). (Photograph courtesy of The Hierakonpolis Expedition.)

Figure 13. Sequence of regular, bi-truncated blade tools from Umm el-Qaab (1<sup>st</sup> Dynasty) and Elephantine Island (2<sup>nd</sup> to 5<sup>th</sup> Dynasty). (Illustration by the author.)