

## STONE TOOL PRODUCTION AND FLINT MINING IN ANCIENT EGYPT\*\*

Alfred F. Pawlik

### ABSTRACT

*The Institute of Egyptology at the University of Tübingen, with the aid of the German Research Foundation (DFG), conducts investigations in Middle Egypt since 1991. The fieldworks focus on several localities in the Province of Miniya near the village Šaruna, close to the river Nile. The lithic inventory not only includes a total spectrum of known and characteristic tools of the Old Kingdom (Pharaonic Egypt) but also shows numerous new types and forms. The presence of various blanks and cores and the systematic analysis of the debitage proved the presence of local workshops with their own characteristic tradition.*

*Excursions and field surveys conducted at the flint mines of the nearby Wadi al-Sheikh showed that the majority of the excavated lithic material had high similarities with the mostly tabloid flint found there. This points to a relationship between Šaruna and the huge flint mining area of the Wadi. The material is of excellent quality and due to its tabular form, appropriate especially for the production of the flat bifacial knives and adze blades found in Šaruna.*

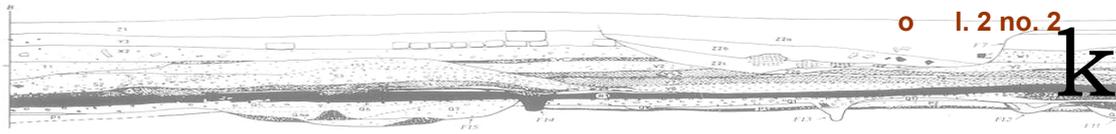
Since 1991 the Institute of Egyptology of the University of Tübingen, with the aid of the German Research Foundation (DFG), has been conducting investigations in Middle Egypt. The fieldworks have focused on several localities in the Province of Miniya near the village Šaruna, close to the river Nile. These are mainly on the site *Kom al-Ahmar* ("Red Hill"), a mound formed by habitation layers since the Neolithic (Huber 1998). Today there is still a small village located on top, the so-called "*Izba*" which simply means "hamlet".

Attached to that pharaonic village was a large necropolis with numerous shaft and chamber graves and several surrounded outposts which are interpreted as watch towers. This necropolis was earlier investigated by the same institute (Gomaà 1983). It was continuously used from the 6th Dynasty of the Old Kingdom up to the Ptomelaic epoch.

To investigate the complexity and continuity of the pharaonic site at Kom al-Ahmar, a network of sondages and profile trenches were laid within the still inhabited *Izba*. Because this place is still occupied, some problems were encountered in planning for the excavations. Most of the trenches and sondages had to be laid according to the available empty spaces within the village and not to actual archaeological needs. The settlement area of the Old Kingdom period showed a larger dimension than the presently existing village. Settlement patterns formed by mudbrick

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\*\* based on the actual lecture presented at the VIIIth International Flint Symposium, Bochum, Germany.



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walls like house foundations, alleys, storage silos, stables etc. have been widely excavated (Figure 1). It seems that Kom al-Ahmar was mainly a peasant community. No indications for either religious or administrative buildings have been found yet. Instead, workshops for the production of pottery and especially stone tools have been detected.

The author had the chance to study the lithic artefacts mostly in the afternoon after the day's excavations had ended. The very limited time and the impossibility of bringing the artefacts for further analysis to his laboratory in Tübingen allowed only a brief examination of the huge material. In 1995, the artefacts were recorded with a simple attribute system and only a small number of the lithic materials were photographed while in 1996, at least for some of the tools, drawings were made. Still, rather interesting and new results and observations could be gained. Kom al-Ahmar is one of the very few sites where, according to the presence of blanks, cores, preparation flakes and pre-forms, workshops for stone tool production could be reconstructed (Pawlik, *in press*).

A large number of stone artefacts and tools have been found, mainly from layers of the Old Kingdom and some from Middle Kingdom layers. Almost all artefacts were made from a high quality, fine-grained flint or "*silex*", to use the general term for this material (Hahn 1993:12). The lithic inventory includes the total spectrum of characteristic Old Kingdom tools as well as numerous so far unknown tool forms. The analysis of blanks and preparation debris gave indications of local workshops with their own distinctive craft tradition. Furthermore, it can be assumed that these workshops produced not only for local consumption but also for trading or exchange with other localities and for use at the nearby necropolis (Gomaà, 1983; Huber 1998:575). The bifacial "butchering knives" in particular, produced in a great variety of forms and sizes and used for ritual butchering during burial ceremonies, give indications for this assumption.

Basically, three categories of blanks were present: preparation flakes from the production of bifacial tools, very regular blades and their cores. The blades were either unretouched and without visible use traces or denticulated at least along one edge, visibly rounded and covered by sickle gloss. Remarkably, measurements of the width showed that median and inner quartiles of both unused and used blades were practically identical, showing that besides denticulation there was no reduction of the width during use and also no "resharpening" was performed. Blades were produced at the site as the presence of ridge blades, core tablets, remnant cores and core fragments among the artefact material indicated. One sixth of all blades were ridge blades. However, there were very few primary ridge blades. Presumably, the initial core preparation with the creation of a leading ridge and a striking platform and the detaching of the primary ridge blade was done outside, most likely directly at the raw material sources before transporting the cores to the village.

A fascinating tool category is the bifacially retouched knife (Figure 2), used for ritual butchering during burial ceremonies based on various illustrations and inscriptions found in several tombs. These knives were produced from a tabular silex in workshops inside the village. Already prepared pre-forms have been found as well as large preparation flakes totally covered with cortex, so that again an import of initially worked pre-forms besides unworked raw material is possible. According to available literature pre-forms and preparation flakes are usually lacking in pharaonic settlements of the Old Kingdom. The explanation, therefore, was that the production

and trade of bifacial knives was organized at a production center for the whole kingdom. Now, one conclusion might be that the locality at Kom al-Ahmar was such a center. Another, however, is that we are just dealing with an "excavation artefact," meaning that preparation debris and pre-forms haven't been collected during excavations or neglected or overlooked during the post-excavational analysis of the findings, since up to now very few lithic archaeologists have been involved in Egyptology and its fieldworks. A total number of 31 bifacial knives have been found until 1996. Some of them fit to the known scheme of knife typology while others showed new forms or combinations of these types. Only one knife belongs to the Middle Kingdom. All others were Old Kingdom artefacts.

The same skills were used in producing bifacial adze blades, only with flaking technique and without grinding (Figure 3). The 19 adze blades found, however all showed a heavy rounding of the edges caused by intensive use. This kind of use pattern really resembles the sickle gloss found on the used blades. It might be possible that these adzes were used for cutting the phytolith-containing leaves of palm trees, but this has to be verified by experiments and use-wear analysis first. Up to now there is only little information about these adze blades. The Izba-adzes showed different forms and cross-sections from those found in Giza and Abydos. Among the findings were no pre-forms or preparation flakes, unlike for the knives and sickle blades.

A great variety of other toolforms completes the lithic inventory of Kom al-Ahmar. Masterpieces of Old Kingdom craftsmanship are bracelets made of flint (Figure 4). This beautiful piece is totally, "trifacially" retouched but without grinding or polishing. Only the ancient Egyptian flintknappers were able to produce these fragile bracelets using a combination of percussion- and pressure technique. Complete and undamaged bracelets are very rare and this is the only complete bracelet found at Kom al-Ahmar so far. A real unicate is an S-shaped bifacial artefact (Figure 5). Both its ends are broken. But there is no sign of damage or wear, so that we can only speculate for its function.

This amazing tool production was supported by the availability of an excellent flint material. The nearest source for that silex is the famous flint mining area of the Wadi al-Sheikh (Figure 6). During both excavation campaigns, excursions to this immensely extended mining field were undertaken on very bumpy rides on the carrier of a tractor from a local transport company. Despite its fame and archaeological importance, very few expeditions led to this place since its first appearance in archaeological science more than a hundred years ago. One reason is the difficult geographical and political situation of this region. Another is the huge extension of the mining areas on the Eocene limestone terraces of the Wadi, which still hasn't been totally surveyed. The latest report about the Wadi was published in 1982 and 1987 by Prof. Gerd Weisgerber from the German Mining Museum and served as a guidebook during the excursions in 1995 and 1996.

The first aim was to collect raw material samples and verify the Wadi al-Sheikh as the major raw material source for the tool production at Kom al-Ahmar. On the other hand, this also meant that the beginning of flint mining activities in the Wadi could be dated at least to the 1st or 2nd dynasty of the Old Kingdom. This might be of interest since previously only material of the younger periods since the Middle Kingdom had been identified and earlier activities were only presumed.



Figure 1 (left) Excavations at Kom al-Ahmar.

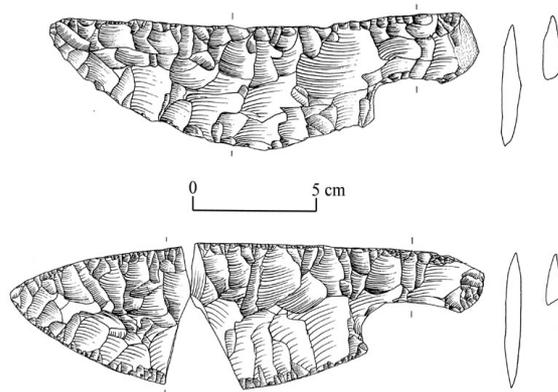


Figure 2 (right) Bifacial knives.

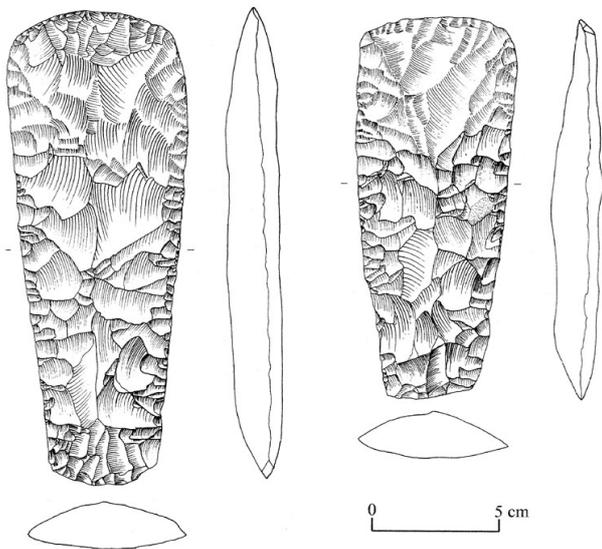
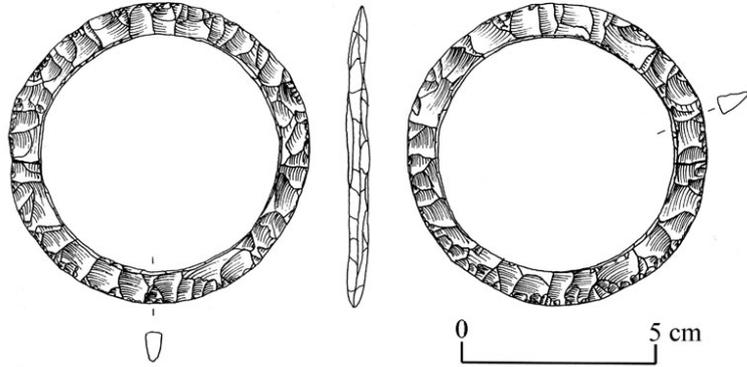
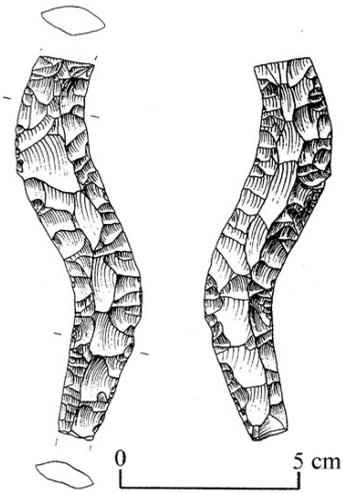


Figure 3 (left) Bifacial adze blades.



**Figure 4 (right)**  
Bracelet made of flint.



**Figure 5 (left)** S-shaped bifacial object.

**Figure 6 (right)** The Wadi al-Sheikh.



Of course, some of the quarries have been explored during the brief survey. In many cases, working areas for the production of preforms and blades were directly attached to the pitmouth. Significant surface structures are pitheaps of limestone, circular walls around the pitholes (Figure 7). The workshop areas with the now dark-brown patinated flint show a sharp contrast to the limestone debris. The extension of the mining area and the distribution of flint material are simply overwhelming. In both campaigns, the team could not reach the end of this seemingly endless Wadi and its flint mines. However, in 1996 it was possible to pinpoint the excursion route with the aid of a GPS receiver and create a rather accurate survey map. The examination of the flint-knapping workshops this time showed that there was a specialized production structure. Obviously, there were separate workshops for the production of bifacial preforms and for the production of blades. Still, no signs of a settlement for the miners and their families have been found. The few stone settings seen, seemed to be rather contemporary. However, the author's assumption is that the miners' villages were not located at the total dry and waterless terraces 40m above the wadi bed. More likely seems a location in the Wadi valley itself. Until today, relatively strong vegetation indicates a high groundwater level and a good chance for building wells. To protect the settlements against the dangerous floods after heavy rains, they might have been situated near the terraces or slightly upwards the slopes. But due to the high grade of erosion in the Wadi it is surely very difficult to discover such a village since it requires an extensive site catchment of the whole area.

In any case, the Wadi al-Sheikh region, maybe the largest monument of ancient Egypt, is worth further exploration and a more extensive research. As a next step, surveying and mapping of the area and the mining fields, the pits, heaps, flint workshops and other structures is necessary to get an overview of the geographical extension, the chronology of the various mining quarters and their relations. Examination of the workshops and the search for settlement patterns should follow, then. It is hoped that this can be done in the near future, although a lot of governmental and financial support is needed.



**Figure 7 (left)** Pitmouth surrounded by limestone pitheaps.

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