Interregional Contacts in the Later Prehistory
of Northeastern Africa
Poznań 1996

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Raw material procurement in the Tarifian and in the Naqada Culture: a case study from the Nile Valley in Upper Egypt

Introduction

One aspect of investigations into lithic inventories of Predynastic Egypt is the question of lithic raw material procurement and processing. The discussion of the issue is particularly difficult as the basic raw material used in chipping techniques, viz. flint, was widespread in this section of the Nile Valley in Upper Egypt.

Investigations into the differentiation of flints have been limited so far to the Theban Gebel where considerable variability of both macro- and microscopic characteristics, also mineralogical and geochemical differentiation of flints have been established in the vertical cross-section of limestone rocks of the Theban Gebel (Ginter et al. 1985: 17). Simultaneously, excavations were conducted by the authors of this paper on the multilayer sites located at the foot of the Gebel i.e.: El Tarif and Armant. This has enabled us to evaluate types of local raw materials which were used, and the place and method of their processing within the area of the settlement. In addition, the importance of specialized workshops, located always in the vicinity of extraction points, for supplying the settlement with raw material, has been evaluated (Fig. 1).

Because the territorial range of the survey conducted near the raw material deposits was relatively limited the question of mesolocal raw materials has presented more problems. Identification of areas of deposits of these raw materials was difficult, sometimes impossible. A similar situation was found also in the region north of Western Thebes as far as Hemamieh where the imported Theban raw materials occur as mesolocal accompanied by other raw material whose provenance has not been determined.

We have not established, in the explored area, the presence of extralocal flints from deposits located at a distance of more than a hundred kilometres. In all likelihood absence of extralocal materials is connected with the abundance of

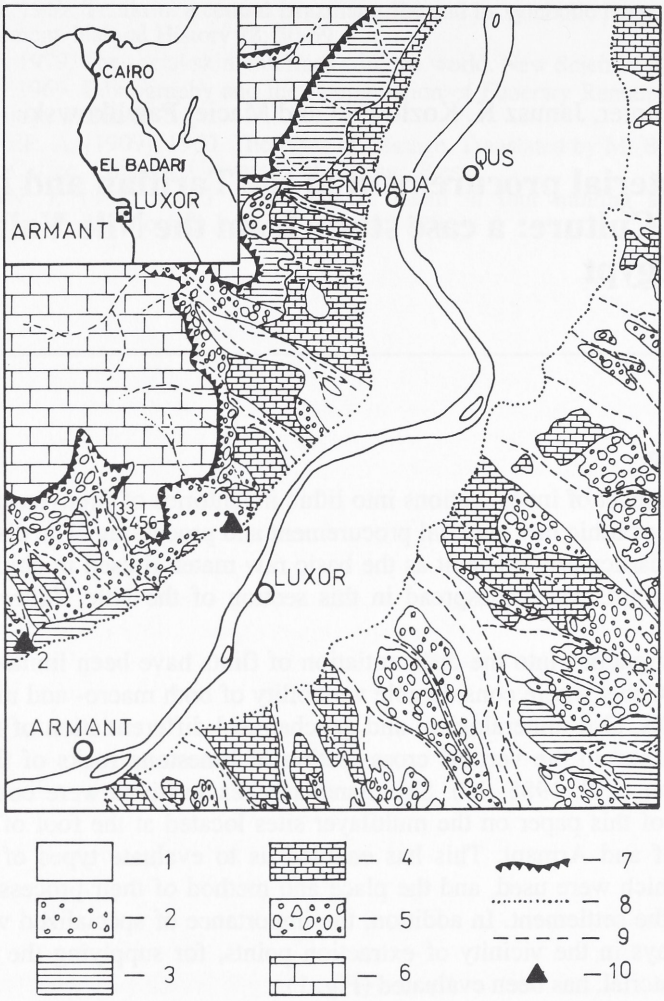

Fig. 1. Map of the surveyed area. Numbered sites: 1 El Tarif, 2 Armant MA 21/83.

1 Floodplain,
2 younger pediment,
3 Neo-Nile silts,
4 Dendara-Qena formations,
5 Pliocene formation,
6 Theban Limestones,
7 cliff,
8 limit between low desert area and cultivation zone,
9 wadi beds,
10 multilayer Predynastic sites.

local flints and imports from nearby deposits. On the other hand, we have recorded some extralocal raw materials other than flint, which were not worked, as a rule, by chipping technique.

Although the present work is based only on selected and incomplete results of investigations, it is nevertheless the first attempt at describing the sys-

tem of raw materials procurement in the cultures of Predynastic Upper Egypt. In terms of chronology the present paper covers the period of development of the Tarifian (5th mill. B.C.) and the Naqada culture (4th and 4/3rd mill. B.C.). We have compared two taxonomic units focusing our attention in particular on the differences within the sequence of the development of the Naqadian layers in the site of Armant (MA 21/83), and the differences between synchronous sites of the Naqada culture viz. between the site of El Tarif and the younger phase of the site MA 21/83.

Major groups of raw materials and their provenance

The western bank of the Nile in the region of Thebes is built of sedimentary rocks containing numerous flint nodules. This is in contrast with the Eastern Desert which is built from igneous, metamorphic and detric rocks which do not contain flint. The most complete cross-section of limestone rocks is found in the Theban Gebel itself where over 30 levels of occurrence of flint nodules have been identified. Naturally, only some of these flints had properties which answered the requirements of prehistoric man. Among the types with high fissibility three groups, macroscopically distinguishable, should be mentioned: grey flint referred to as "Theban", grey-pink flint, and green flint.

Grey flint is present in several levels of Theban limestones from the floor to the top part. Grey-pink and green flints are contained primarily in the middle part of the sequence of Theban limestones, in the neighbourhood of structural platforms above the column weathering series (Fig. 2). All the flint types, also those with poor fissibility, occur as well in secondary deposits viz.:

1. in gravitational fans and scree sheets at the foot of the cliff, and on structural platforms,
2. in the pediments and wadi beds carrying material from the hills to the Nile Valley.

Our investigations have confirmed that all the types of deposits were used as the source of raw material.

The types of flints enumerated above are easily distinguishable on the basis of their macroscopic features such as, first of all, colour. It should be pointed out, however, that mineralogical examination of these flints reveals fairly close proportions of chalcedony (87-93%), quartz (5.6-10.2%), carbonates (1.1-1.4%) and opaque minerals (invariably 0.1%). Grain fractions are also similar. Grey-pink flint is an exception as it does not contain the fraction bigger than 10μ which influences the quality of this type of raw material. Differences between the above-mentioned raw materials become apparent only in geochemical characterization. Thus, green flint differs considerably from grey flint in respect of the content of minerals such as Na, K, Mn, Ni, Cu, Pb and Cr. Grey-pink flint, on the other hand, differs from the latter type in respect of the content of Na and Mn.

In the Predynastic series under investigation all the enumerated macroscopic types are represented both by specimens derived from primary deposits or

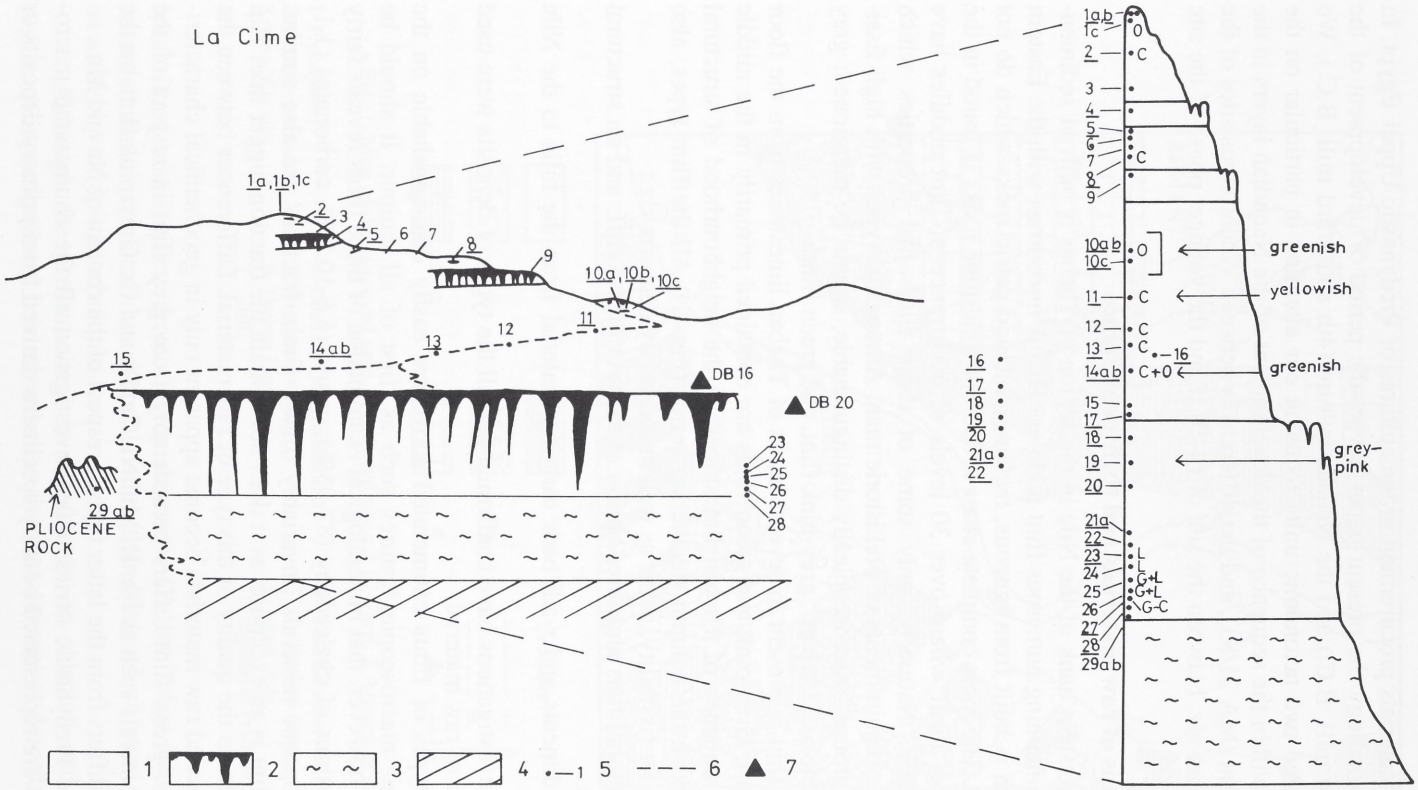

Fig. 2. Flint outcrops in the profile of the Theban Gebel:
1 - Theban Limestone, 2 - Theban limestone beds with culumn weathering, 3 - Esna shales, 4 - scree at the foot of the hill, 5 - sampling spots and numbers indicating flint samples, 6 - paths.

gravitational fans as well as from alluvial deposits. The latter have cortex which is river-worked in varying degree or patinated surfaces without cortex.

In the archaeological sites in the investigated region we have distinguished several types of raw materials which have no analogues in the local Theban limestones. This is first of all black flint, opaque, almost matt, present in the form of spherical nodules. In the investigated area these flints are found only as small chunks (which are unsuited for processing) in the Qena sands. This indicates that deposits of this raw material are located in the areas to the south. At the same time we know that a similar raw material is found in Palaeolithic sites in the region of Esna. To the same group of flints belong as well transparent pink flints with opaque, light intercalations, and opaque grey flints with slightly glossy surfaces. Possibly, these flints come from limestones north of the investigated region. However, the precise location of their deposits is not known, nor the location of deposits of several other types found e.g. on the sites in the region of Hemamieh.

Besides flint the investigated sites contained as well metamorphic and igneous rocks. Rocks like this are not known in the Nile Valley or in the adjacent part of the Western Desert. These are rocks such as rhyolite-porphiry, keratophyre-trachyte, diabase and fine-crystalline red granite. These rocks occur in the region of Wadi Hammamat where identical diabases are abundant and where metamorphic rocks of the type of serpentine and trachyte have been identified. Therefore, the enumerated rocks all come from the Eastern Desert and the state of preservation of primary surfaces indicates that they were collected from alluvial sediments in that region.

Some of the sedimentary rocks found on the investigated sites also come from the Eastern Desert. This is, for example, breccia antica whose quarries were exploited in the region of Wadi Hammamat in the Pharaonic period. The data concerning the provenance of metamorphic shales and nummulithic limestones are less precise.

The Tarifian

Our characterization of raw materials of the Tarifian is based on the data from the site in El Tarif (Ginter et al. 1979a: 19). The general structure of the series of more than two thousand artefacts is dominated by the grey "Theban" flint which accounts for 81.9% of raw materials. It is interesting that the local green flint is present only in trace quantities amounting to only 0.2% whereas flints which are probably mesolocal viz.: greyish (6.2%), black (4.6%) and pink (1.0%) occur in significant proportions (Fig. 3).

The general structure of major groups of artefacts made in grey "Theban" flint shows that the whole of the cycle of technological operations was carried out in the area of the settlement. This is confirmed by the fairly high ratio of cores and the high index of flakes. Wholly cortical specimens are represented (more than 5%) as well as partially cortical (more than 43%). The proportion of flakes

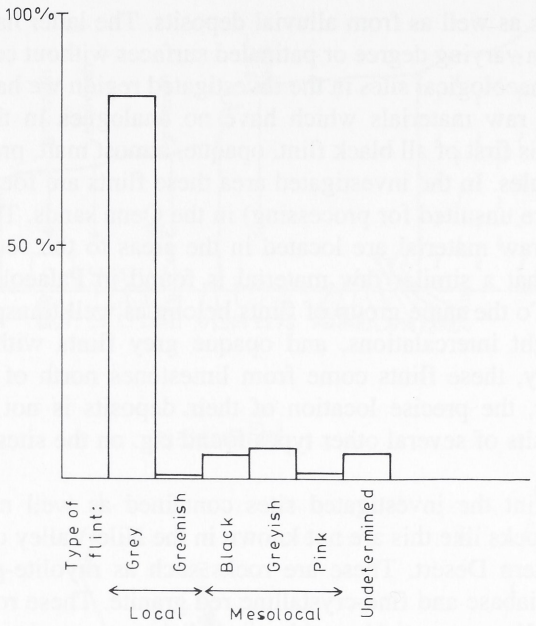

Fig. 3. El Tarif. General quantitative structure of flint types used in the Tarifian layer.

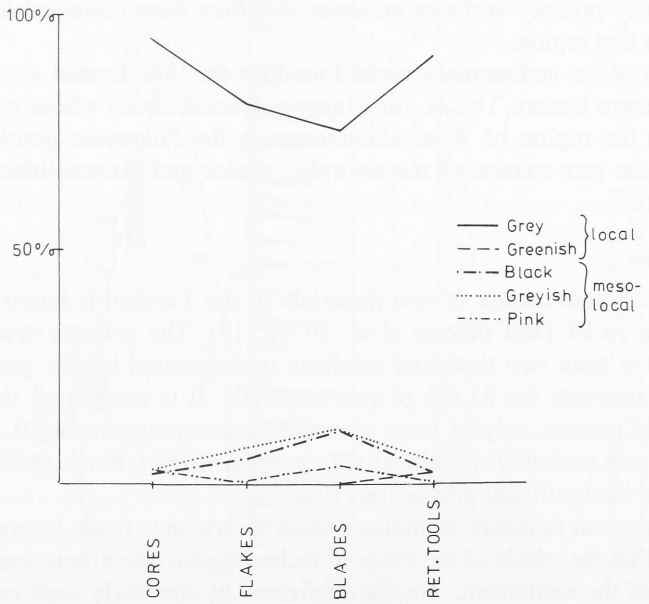

Fig. 4. El Tarif. quantitative structure of flint types in the major technological groups in the Tarifian layer.

without cortex is smaller than of the two groups mentioned above (about 24%). The high ratio of tools is unequivocally indicative of the importance of domestic activities in the area of the site, supplemented by some local lithic production.

As we have already said the local green flint is present only in trace quantities and is represented by only two retouched tools out of 337 retouched implements on the site. There are no cores, flakes or blades made in this raw material.

The structure of major groups made in mesolocal materials is different than that of grey "Theban" flint. In the case of greyish and black flint the ratio of cores and tools shows distinct predominance of tools which suggest that blanks or ready tools were brought to the site. The role of local production in the case of these raw materials is much smaller than in the case of grey "Theban" flint (Fig. 4). If in the case of grey flint there are on average 2.5 blades per one core, in the case of mesolocal flints there are on average 16 blades per one core. The quantitative structure of pink flint has been left out since artefacts made in this material are very few.

The scatter-pattern of finds on the site of El-Tarif has been analysed only for a relatively small part of the site systematically excavated (Ginter et al. 1979b: 92-93) and small clusters of finds also around hearths have been revealed. This type of scatter-pattern of finds approximates patterns known on the sites of the Late Palaeolithic rather than typical Neolithic sites. The fairly proportional distribution of particular groups of artefacts, also of accompanying ceramic fragments, seems to rule out the existence of differentiated areas of activity including separate zones of lithic production. An analogous situation has been recorded on the Tarifian site MA 2/83 where, too, lithic finds and ceramics occurred in small concentrations of which one was associated with a preserved hearth similar to the hearth discovered in El-Tarif (Ginter et al. 1985: 27).

The described types of scatter-pattern together with the general level of technology evidence that local production of lithic artefacts had a incidental character and was not specialized. The presence of imported raw materials, represented by an incomplete production cycle, can be accounted for by the mobility of Tarifian population groups in the whole region under investigation. Imported raw materials constituted a stock of material brought to the site at the moment when the camp was being set up.

The Naqada culture

The fullest sequence of the development of this unit has been provided by the sites in the vicinity of Armant, notably by the systematically explored site MA 21/83 and partially by site MA 21A/83 (Ginter & Kozłowski [eds] in press). The sequence of these settlements does not, however, cover the whole period of younger Predynastic cultures in the area under discussion as the youngest phases distinguished by Kaiser (1957) in the cemeteries of Armant, are not represented.

Throughout sequence MA 21/83 artefacts produced by chipping technique are made exclusively in local flints primarily from the middle levels of theTheban

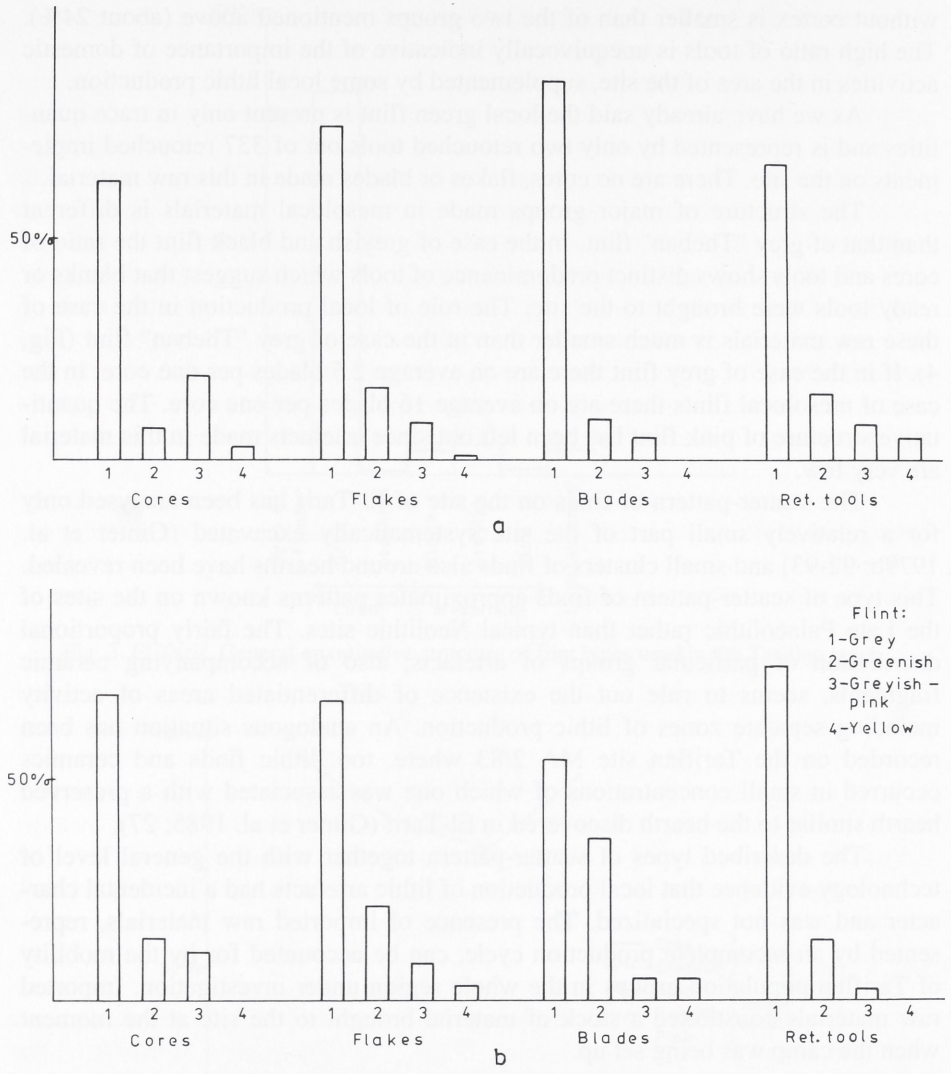

Fig. 5. Armant, site MA 21/83. Quantitative structure of flint types in major technological groups: a - older and middle phase, b - late phase of the settlement.

Gebel. The same raw materials were also collected from pediments and alluvia in the region of the Low Desert. The local flints include grey, grey-pink, greenish and yellow flint.

In all the chronological phases and all investigated sections of the site grey flint predominates. The proportion of particular raw materials within major technological groups has been shown in diagrams in Fig. 5.

The proportion of particular raw materials in major technological groups in the older and middle phases is similar. The dominant grey flint (on average 70% in each group) is followed by: greenish (7-16%), grey-pink flint (5-15%) and yellow flint (0-5%). The only exception is the bigger proportion of grey-pink flint in the group of cores (19%). This consistency of the raw material structure of flakes, blades and tools is yet another argument in support of the thesis about the existence of the complete cycle of production and exploitation of artefacts *in situ*.

In the younger phase the general structure of raw materials is similar but the proportion of grey flint is slightly smaller than 70%. Some changes take place, however, in frequencies first of all of green flint viz.: its participation in the blade group is very high (36%) approximating that of grey flint (54%). In the flake group too the proportion of green flint is increased (21%). This can be interpreted as evidence that ready blades were brought to the site from workshop situated most probably in the immediate vicinity of deposits. The higher ratio of flakes in green flint, on the other hand, can be accounted for by production of bifacial tools, mainly axes, on the site and their rejuvenation.

A characteristic feature of the site at Armant is the absence of mesolocal flints. An exception is the only tool made in black flint, analogous to that from El-Tarif, found in the lower layer of site MA 21A/83. Several tools made in brown flint, found on the same site (0.88% i.e. 5 specimens out of 571 tools in this group of artefacts) may also represent mesolocal raw materials which have not been identified in the local Theban limestones. The question of extralocal raw materials will be discussed later in this work.

A different raw material structure is represented by assemblages from Naqadian layers on the site of El-Tarif. These layers are contemporaneous (radiocarbon dates) with the younger phase of settlement MA 21/83 at Armant. In the Naqadian layers too a distinct predominance of grey "Theban" flint has been recorded whose ratio is as high as 70%. Another local raw material, green flint accounts for only 2%. Mesolocal raw materials viz.: greyish flint (7.5%), black (9.0%) and pink (2.4%) together make up a significant proportion of raw materials (Fig. 6). In comparison to the frequency of the most important raw materials in the Tarifian layer on the same site a marked drop in the ratio of grey "Theban" flint is noteworthy. The ratio of green flint is ten times as high, and the proportion of mesolocal flints is almost twice as high. Significant differences are observed as well when Naqadian layers from El-Tarif are compared with Naqadian layers from Armant. On the latter site mesolocal flints are practically absent and the ratios of grey "Theban" flint and green flint are closer.

The importance of major artefact groups made in local flints cannot be explained exclusively by local production since the ratio of cores to ready tools is 1:8, whereas that of cores to retouched tools and blanks is 1:15. Let us remember that in the Tarifian layer on the same site the ratio of cores to tools in the case of local raw materials is about 1:5 whereas the ratio of cores to tools and blanks is

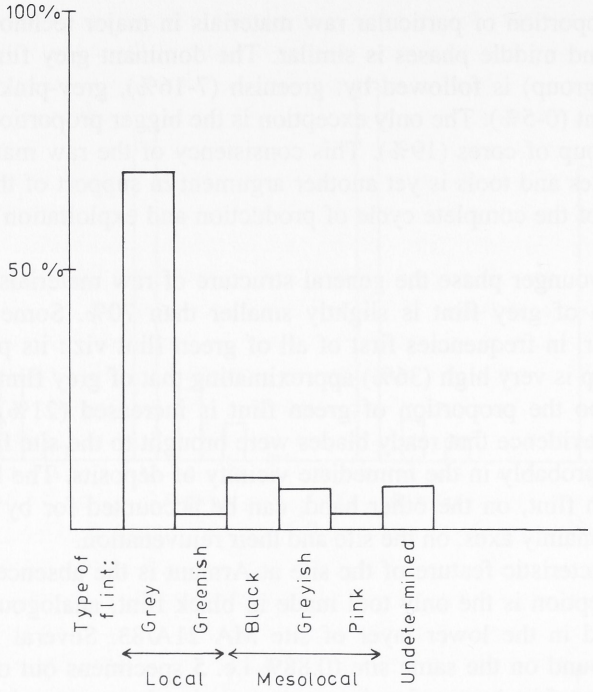

Fig. 6. El Tarif. General quantitative structure of flint types used in the Naqada layer.

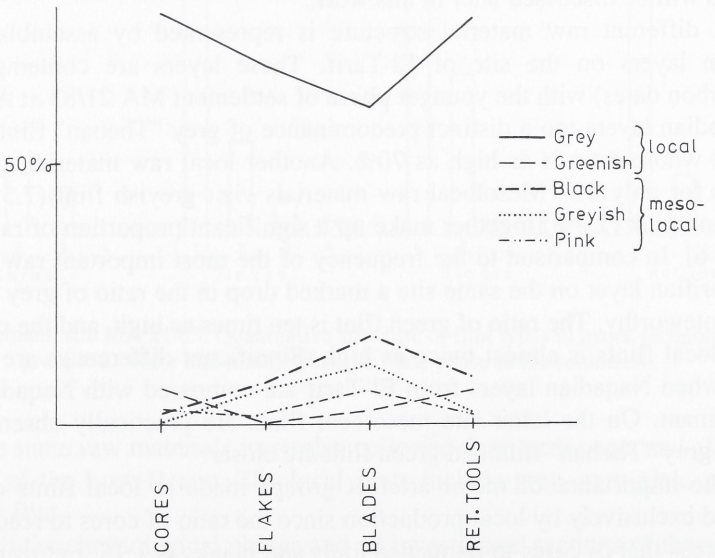

Fig. 7. El Tarif. Quantitative structure of flint types in major technological groups in the Naqada layer.

1:7. These differences, independently of the more flake character of the Tarifian, reflect smaller importance of local treatment in the full sequence of production in the Naqada culture. This is confirmed by the distinctly lower ratio of cortical flakes (wholly cortical or with more than 50% of cortical surface) in the Naqada culture.

In the case of mesolocal raw materials in the Naqadian layer the role of local treatment is even less conspicuous. The ratio of cores to retouched tools is 1:23, cores to tools and blanks is 1:65. This indicates that only a very small part of mesolocal raw materials reached the site as unworked or decorticated nodules. The bulk of these materials was brought as blanks or tools.

When Naqadian assemblages from El-Tarif are compared with the chronologically corresponding younger phase of site MA 21/83 at Armant a general similarity can be noticed of the frequency of major groups of artefacts made in local raw materials. The ratio of cores is 2.3% in El-Tarif, in the north part of site MA 21/83 - 2.5%, in the southern part of the same site - 1.9%. The ratio of flakes at El-Tarif is 68.1%, and in the two parts of site MA 21/83 it is 73. 7 and 73.6% respectively. Blades in El-Tarif amount to 14.8%, on site MA 21/83 they are 11.8 and 12.4% respectively. The ratio of tools is higher in El-Tarif i.e. 18.6% than on site MA 21/83 where it is 8.4 and 5.6% (Fig. 7). The proportionate importance of the full operational chain in local production is therefore similar on these sites. The main difference is that on the sites near Armant mesolocal raw materials are absent.

The importance of raw materials from the Theban Gebel clearly goes beyond the territories closest to the Gebel in the Nile Valley or along the edges of the Valley. In the sequence of the site of Hemamieh an interesting phenomenon can be observed viz. the appearance of grey and green Theban flint starting from the level between 4.6 ft to 5 ft which corresponds with the maximum intensity of occurrence of red polished and black topped ceramics. In the level between 4 ft and 3.6 ft Theban flints constitute less than one third of all artefacts to gradually disappear in the part of the sequence containing white-painted ceramics.

As far as the issue of local treatment of flint in settlements is concerned interesting data were provided by the analysis of spatial scatter pattern of artefacts on site MA 21/83 at Armant. In the older and middle phases of this settlement a marked spatial variability of indices of major artefact groups can be observed. In the older phase the northern sector of MA 21/83 shows a low ratio of cores (2.3%) but a high proportion of blade blanks (14.6%) and tools. The southern sector, on the other hand, has a much higher ratio of cores (9.9%) and a lower ratio of blanks (9.6%). In the middle phase the situation is similar (Fig. 8). Thus, the early phases of the reduction sequence seem to have concentrated in the southern sector of the site. This situation is reflected in the bigger proportion of wholly cortical flakes, as much as 8% in the early phase, and bigger proportion of waste flakes which automatically makes the index of blades lower in this sector. Production activities consisted not only of preliminary treatment of cores for

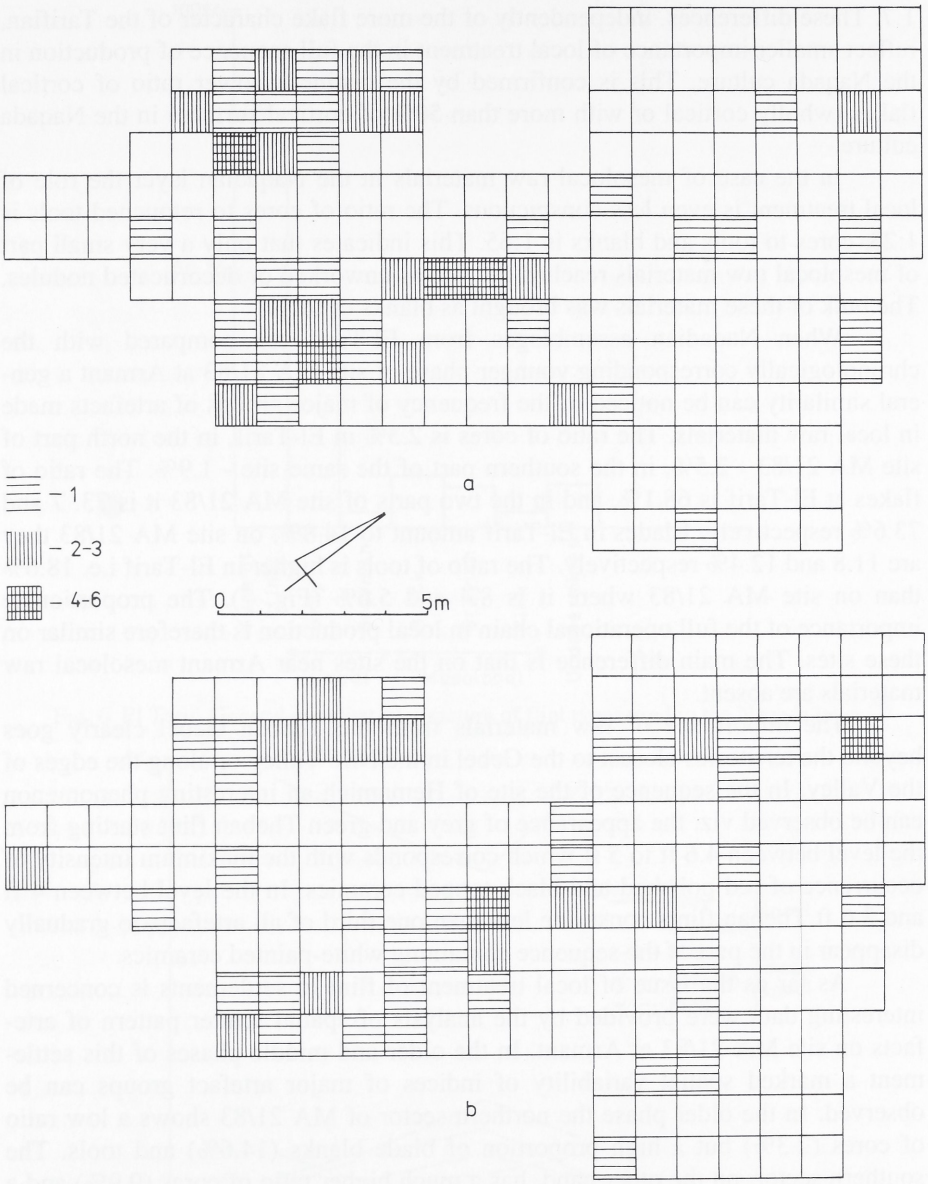

Fig. 8. Armant, site MA 21/83. Distribution of cores in the excavated area: a - older and middle phase, b - late phase of the settlement.

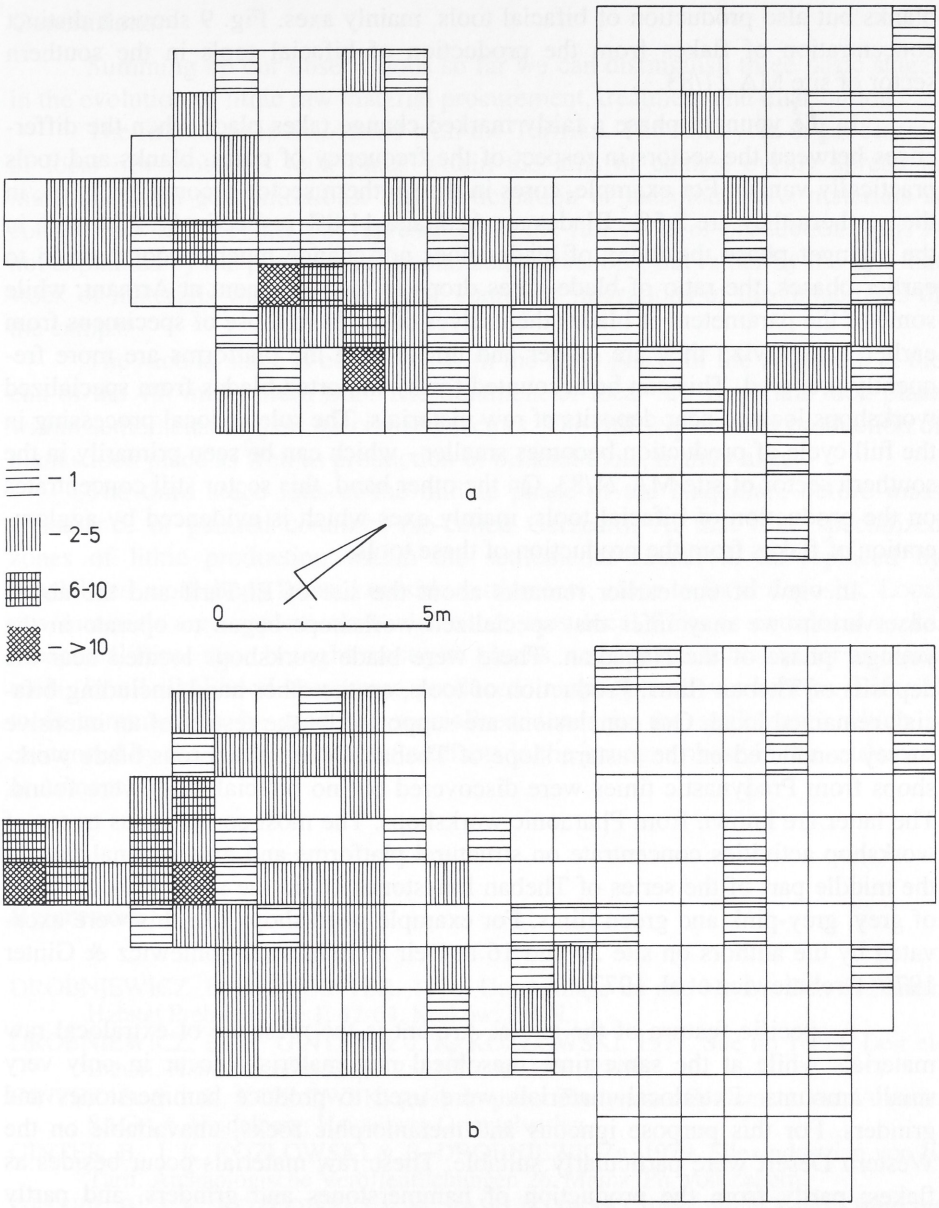

Fig. 9. Armant, site MA 21/83. Distribution of flakes from bifacially worked tools (preparation and rejuvenation): a - older and middle phase, b - late phase of the settlement.

blanks but also production of bifacial tools, mainly axes. Fig. 9 shows a distinct concentration of flakes from the production of bifacial tools in the southern sector of site MA 21/83.

In the younger phase a fairly marked change takes place when the differences between the sectors in respect of the frequency of cores, blanks and tools practically vanish. For example, cores in the southern sector account for 1.9%, in the northern they are 2.5%. Blades are 12.4 and 11.8% respectively. Although in the younger phase the index of blades does not change much in comparison to earlier phases, the ratio of blade cores drops in the settlement at Armant, while some of the parameters of blades themselves differ from those of specimens from earlier phases viz.: they are longer and thicker and the platforms are more frequently prepared. This can be accounted for by imported blades from specialized workshops located near deposits of raw materials. The role of local processing in the full cycle of production becomes smaller - which can be seen primarily in the southern sector of site MA 21/83. On the other hand, this sector still concentrates on the production of bifacial tools, mainly axes which is evidenced by agglomeration of flakes from the production of these tools.

In view of our earlier remarks about the site of El-Tarif and the above observations we may infer that specialized workshops began to operate in the younger phase of the Naqadian. There were blade workshops located near the deposits of Theban flints. Production of tools, on the other hand, including bifacial, remained local. Our conclusions are supported by the results of an intensive survey conducted on the eastern slope of Theban Gebel. Numerous blade workshops from Predynastic times were discovered but no bifacial tools were found. The latter are known from Pharaonic workshops. The most conspicuous traces of workshop activities concentrate on structural platforms and gravitational fans in the middle part of the series of Theban limestones i.e. in the areas of occurrence of grey, grey-pink and green flints. For example, workshops like this were excavated by the authors on site 20 and 16 at Deir el Bahari (Drobniewicz & Ginter 1976; Drobniewicz et al. 1977).

A specific feature of the site at Armant is the presence of extralocal raw materials while at the same time mesolocal raw materials occur in only very small amounts. Extralocal materials were used to produce hammerstones and grinders. For this purpose igneous and metamorphic rocks, unavailable on the Western Desert were particularly suitable. These raw materials occur besides as flakes: partly from the production of hammerstones and grinders, and partly detached accidentally when the tool was being used. Igneous and metamorphic rocks are present in very small amount and mainly in the younger phase. As we have mentioned in the Introduction they originate from the territory of the Eastern Desert, notably from the region of Wadi Hammamat. Together with the presence of shells from the Red Sea coasts they bear witness to contacts with the territories situated between the Nile Valley and the Red Sea.

Conclusions

Summing up our observations so far we can distinguish three basic stages in the evolution of lithic raw material procurement, treatment and distribution.

The first stage is associated with the Tarifian. The full cycle of processing of local raw materials took place within the area of camps, evenly spread in multifunctional concentrations. The participation of mesolocal raw materials is conspicuous but they are not represented in the full cycle of production. This is not explained by the presence of specialized workshops, but rather by the fact that stock of materials was brought in the course of migrations of the inhabitants of the camps.

The second stage is connected with the early phase of the Naqadian at the end of the 4th millennium B.C. The treatment of local raw materials took place within settlements in their specialized sectors. The full sequence of production of blanks took place as well as production of bifacial tools, mainly axes.

The third stage falls at the middle phase of the Naqadian, before mass appearance of painted ceramics (so-called Gerzean). At that time specialized zones of lithic production within the settlements vanish to be replaced by specialized workshops located outside settlements, close to local deposits. Local raw materials are supplemented with either mesolocal flints or extralocal rocks. Mesolocal flints were brought mostly as blanks, notably blade blanks, or as ready tools. In all likelihood they were produced in specialized workshops. Bifacial tools continued to be made in specialized zones in the settlements which is evidenced by the scatter pattern of artefacts in the younger phase in the settlement at Armant.

References

DROBNIEWICZ, B. & B. GINTER. 1976. Un outillage du site No 20. Deir el-Bahari. Habitat Prehistorique 1: 42-64. Kraków: PWN.

DROBNIEWICZ, B., B. GINTER & J. K. KOZŁOWSKI. 1977. Site no 16/74. Deir el-Bahari. Habitat Prehistorique 2: 31-86. Kraków: PWN.

GINTER, B. & J. K. KOZŁOWSKI (eds). In press. Predynastic Settlement near Armant. SAGA 6, Heidelberg: Heidelberg Orientalverlag.

GINTER, B., J. K. KOZŁOWSKI & B. DROBNIEWICZa. 1979. Silexindustrien von El Tarif. Archäologische Veröffentlichungen 26. Mainz: Ph. von Zabern.

GINTER, B., J. K. KOZŁOWSKI & M. PAWLIKOWSKI. 1985. Field Report from the Survey Conducted in Upper Egypt in 1983. Mitteilungen des Deutschen Archäologischen Instituts Abteilung Kairo 41: 15-42.

GINTER, B., J. K. KOZŁOWSKI & J. ŚLIWA. 1979b. Excavation Report on the Prehistoric and Predynastic Settlement in El Tarif during 1978. Mitteilungen des Deutschen Archäologischen Instituts Abteilung Kairo 35: 87-102.

KAISER, W. 1957. Zur inneren Chronologie der Naqadakultur. Archaeologia Geographica 6: 69-77.