LITHIC RAW MATERIALS OF THE LATE PALAEOLITHIC/NEOLITHIC INDUSTRIES IN JABAL NEFUSA, TRIPOLITANIA

ABSTRACT — The mineralogic-petrographical character of the raw materials of the Late Palaeolithic/Neolithic stone industries, collected at several open air-sites in the area of Jabal Nefusa, have been studied and the origin of the raw materials have been recognized. Two types of Upper Cretaceous (Natul Formation) cherts (the coloured and the striped ones), used for the manufacture of implements, have been distinguished. They may be considered either local or short-distance imported raw materials.

KEY WORDS: Raw Materials — Stone Industries — Jabal Nefusa — Libya.

INTRODUCTION

Jabal Nefusa is the principal morphological unit of north-western Libya (Tripolitania). In places it was given local names as Jabal Gharyân in the central sector (Yafirin-Gharyân stripe) and Jabal Tarhûnash and/or Jabal Mielanta in the eastern sector (Tarhûnash — Mielanta stripe). The imposing Jabal Nefusa Escarpment rises up south of the Jefara Plain, and runs continuously from west (from Nalut) to east and than to north-east to reach the coast near the town of Al Khums (Fig. 1). Its altitude reaches up to 700 m and more making it 400 m higher than the Jefara Plain. It is dissected by deep wadis and canyons which shape the scarp into highly developed promontories and embayments. To the south, the escarpment merges into the Al Hamda al-Hamra plateau. The climatic effect of the escarp is to attract a relatively greater rainfall than the surrounding territory, and so form a fertile zone and supply the source of water for past and present inhabitants.

The area of Jabal Nefusa was densely occupied in prehistory (McBurney, Hey 1955; Neville 1956 a, b; Fabbrì, Winthrope-Scott 1965; del Fabbro 1968; Jelfiz 1982a, b). Most of the studied industries may be attributed to the Late Palaeolithic Capsian and to the Neolithic of Capsian tradition but sometimes it is difficult to distinguish the both complexes during the surface survey. The only stratified evidence comes from the site of Bir Miji (Neville 1956 a, b).

For the present study we have selected the sites of Nalut in the western sector, Jandûbâh in the central sector of Jabal Nefusa and the rock art sites of Bir Miji and Tarhûnash-Sharhara in the eastern part of Jabal Nefusa (Fig. 1).

NALUT SITE

This site is located 6.5 km north-west of Nalut, 750 m east of the Nalut — Wajra — Chôdâms cross-road (Fig. 2). There is a small shallow depression on the rocky plateau near the escarpment of Jabal Nefusa. In this territory the plateau reaches the altitude of about 500 m a.s.l. and is dissected by very deep canyon-like wadis. The site, placed in the centre of the depression, covers an area of 50 × 50 m. There
is stone industry scattered at the bottom of the depression along with fragments of the used raw material.

The studied sample includes the following typological groups:

1. Backed implements: (2 microlithic points — Fig. 3:1, 2, 2 blade points — Fig. 3:3, 6, 1 microblade, 3 truncated microblades — Fig. 3:5, 6).

2. Other tools: (1 endscraper on retouched blade — Fig. 3:5, 2 atypical endscrapers: 1 horner — Fig. 3:7, 1 laterally retouched blade, 1 truncated blade).

The debitage is composed of 2 atypical cores, 1 core residual, 4 flakes, 1 chip, 21 blades and microblades. The technological process was oriented to blade production.

Dominance of the backed implements and lack of the bifacial technique (absence of arrowheads) demonstrates that the industry belongs to the Capsian, rather of Late Palaeolithic than Neolithic age.

The raw material, used for the manufacture of the stone industry, was collected in the immediate vicinity of the site where plenty of nodular cherts, weathered out of the host rock, cover the ground-surface (residual cherts). That is why the raw material can be considered a local one. The prehistoric man was probably attracted to this place by the abundance of suitable raw material for the manufacture of stone tools.
In the surrounding area the cherts are cropping out in the rock faces and the plateau surface, too. According to the geological map by Novovic (1977) the cherts are confined to the limestones of the uppermost part of the Nalut Formation (Turonian). The limestones are thin-bedded, light-green in colour, crystalline and hard. The chert nodules are small (mostly up to 5 cm in size), irregular and often flattened. The surface of the nodules is smooth. The contact between the host rock and the nodules is sharp. The nodules display a very thin (1 mm on an average) outer rind, white or ochreous in colour.

The cherts are hard, compact, translucent on the sharply broken edges, with waxy lustre and conchoidal or even fracture. Their colour is brown, grey-brown to almost black, pink-violet to red-violet. They are prevalently structureless (homogeneous structure), sporadically occur cherts with an irregularly striped structure (alteration of brown and white stripes).

Some of the chert fragments and implements display a very thin, discontinuous (silt-like), white patina. The others are either completely coated with this patina or they are without patina.

**JANDUBAH SITE**

This site is located some 13 km south-west of Gharyan, in the Jandubah area (Fig. 5). To come to this site we can use a branch-road which turns to the right from the main road Gharyan – Nalut (the distance to the branch is 8.5 km from the Miazlah junction).

There is a larger rocky platform with plentiful chipped industry (main site) just on the upper edge of the escarpment of Jabal Nefusa (marginal part of the plateau). In this area the plateau reaches the altitude of about 800 m a.s.l. Other small sites in the vicinity are scattered on the upper edge of the escarpment toward east to north-east but none of them is so large and rich in industry as the main site. Another very small site is placed on a rocky platform just under the main site. At this place the utilised raw material was probably extracted from the outcrop (big chert nodules, variously broken, crypto out there in a rocky face). Otherwise the residual chert (weathered out of the host rock) covering the ground surface were collected and used for tool making.

The implements are made of cherts of two types:

a) striped cherts

These cherts have been studied by Mrázek and Doughtri (1983). They are confined to the limestones of the Nalut Formation (Campanian – Turonian). According to the geological map by Hinawey and Chebiive (1975) in the Jandubah area and everywhere lying the scarp between Gharyan and western up to the Tunisian border the formation makes the upper reaches of this scarp as well as the plateau surface (Fig. 5). The host rock is a hard, microcrystalline, light-greyish-beige dolomitic limestone. Nodular to lenticular cherts are distributed in some limestone beds just below the sites. Locally very thin bands of chert occur, too. The nodules are big (decimetric in size) and very irregular. The chert bodies exhibit a gradual contact with their host rock. The cherts contain unfractured irregular enclosures of the host rock. The cherts' very conspicuous, mostly fine, irregular, parallel striped structure (or parallelly striped structure in bands) is given by alternation of straw-brown, brown, and white stripes or of dark-grey, greyish and white stripes (Fig. 6). Occasionally by slightly bluish or pinkish in colour occur, too. The cherts are prevalently dull, opaque, and with an uneven fracture. There occur also hard, compact cherts, translucent in splinters, with waxy luster and conchoidal fracture.

The thin-section study has revealed that the striped cherts consist of thin bands (stripes) which show a sharp outer boundary and a gradual inner one. In places both boundaries are gradual with decreasing amount of impurities (represented by clay and euhedral carbonate grains). The cherts consist of some silicified foraminiferal tests, ostracod shells (Fig. 7), gastropod shells (Fig. 8) and echinoderm remains. The course of bands is perpendicular to the arrangement of elongated bioclasts (Fig. 7, 8). The cherts consist of microcrystalline quartz with very fine-grained stripes and granular areas of quartz (those after fossils).

As the striped cherts have been found in the immediate vicinity of the sites it is possible to consider them a local raw material.

b) coloured cherts

They are nodular cherts. The small nodules (centimetric in size) are irregular. The surface of the nodules is smooth, reflecting a sharp contact between the nodules and the host rock. The nodules display a very thin (mostly up to 1 mm) outer rind. The outer rind is light-ocheous in colour. The cherts are hard, compact, translucent to subtranslucent in splinters, with waxy luster and a well developed conchoidal fracture. Their colour is yellowish, greyish, black, but prevalently brown and pinkish. Some of the cherts display a spotted structure or they are darker in the marginal part of the nodules than in the central part. Occasionally irregular enclosures of the light-coloured host rock are present in the cherts. The chert fragments and implements display a very thin, mostly discontinuous (silt-like), whitish patina.

Coloured cherts, as described above, have not been found in the immediate vicinity of the sites (the only exception are big nodules of coloured cherts occurring along with the striped cherts in some limestone layers). Therefore it is necessary to suppose that at least a part of this raw material has been imported from the surrounding area built of the Nalut Formation rocks (short-distance transported raw material).

In the archaeological sample the coloured cherts are represented by 58 artifacts and the striped cherts by 13 artifacts. The coloured cherts were preferred and more intensively transformed into the retouched tools (12% of this material) than the striped cherts (about 3% of this material). The reason for it are the better physico-mechanical properties (esp.
fracture) of the coloured cherts which enable the manufacture of developed products.

Typologically, the tool-kit may be divided into the following groups:

1. Bifacial implements (9 microlithic points including the "lunate" forms — Fig. 3:9—17, 1 blade point — Fig. 3:19, 1 truncated blade — Fig. 3:18). All of them are made of the coloured cherts.

2. Bifacial implements (4 tanged arrowheads — Fig. 3:20, 21, 23, 1 leaf-shaped specimen — Fig. 3:22, 1 unfinished leaf-shaped specimen, 1 knife). With one exception all of them are made of the coloured cherts.

3. Other tools (1 unifacial tanged arrowhead, 2 steeply retouched points — Fig. 3:26, 2 side-scrapers, 1 micro-side-scrapers, 1 borer — Fig. 3:24,

| FIGURE 6. Artifacts made of the striped cherts displaying a conspicuous irregularly striped structure. | FIGURE 7. Striped chert, Jandólah site. Cremet tilsh. \( \times 100 \). A chalk consisting of micrysts of quartz and containing silified surface. The chert is arranged perpendicularly to the course of the dark band. Microphotograph by P. Müller. |
| FIGURE 8. Striped chert, Jandólah site. Ordinary light, \( \times 100 \). The chert contains silified shell debris and a pitted shell. The dark band consists of impurities (clay and carbonate). Microphotograph by P. Müller. |
The retouches are becoming more varied and the bifacial leaf-points appear. In the phase III the tanged arrowheads appear. This last industry is comparable to the Neolithic of Capitan tradition.

All the three complexes were directly related to rock engravings on the abri walls.

The stone industry and the accompanying irregular fragments of cherty raw material are scattered on the slope under the upper group of engravings as well, at the bottom of the wadi along the stream bed, and sporadically also on the ground surface of the plateau overlying the engravings.

In relation to the rock art studies, carried out by Jelinek (1982a), a further collection of 305 artifacts was collected.

The technology is directed towards the flake production from uni-, rarely biaxial cores. The resulting pieces are mainly flakes, rarely blades (Llan—11.1%). Exploitation of prepared cores is witnessed by 3 flakes from the core edges.

There are 21 cores (2 pieces of raw material in the initial stage of working, 6 unidirectional cores — Fig. 10: 22, 23, 3 flat unidirectional cores, 2 biaxial cores, 1 globular core, 4 styloidal cores, 5 core fragments, 3 hammerstones, 143 flakes, 18 blades, 49 fragments, 10 retouched flakes, 9 retouched fragments, and 52 tools.

From the typological point of view, the presence of backed implements is important. The points are rare: they are backed, convergent and bifacial.

The side-scrapers are of archaic, some of them almost Mousterian character and they are accompanied by the micro-side-scrapers. Their retouch is mainly scalloform (6 pieces), marginal (2 pieces), thick (2 pieces), steep (2 pieces) and flat (2 pieces).

Apart from end-scrapers typical for the Late Palaeolithic and Neolithic occur some notched and high types, too. Finally, the burins, notches and dentate tools are present.

1. Backed implements (3 backed blades — Fig. 10:7, 1 backed point — Fig. 10:3, 1 backed microlith — Fig. 10:11).

2. Bifacial implements (1 bifacial point — Fig. 10:8).

3. Points (2 convergent points — Fig. 10:3, 5).
4. Side-scrapers (2 convexes — Fig. 10:21, 2 direct — Fig. 10:15, 10, 4 angular — Fig. 10:18–20, 2 fragments).
5. Micro-side-scrapers (2 convexes, 1 direct, 1 concave).
6. End-scrapers (3 pieces on blade — Fig. 10:8, 9, 13, 4 pieces on flake, 1 nosed scraper, 1 thick scraper — Fig. 10:12, 3 micro-end-scrapers — Fig. 10:10, 11).

7. Other tools (4 burins, 3 borers, 9 notches, 6 dentate tools — Fig. 10:14, 17).

In summary, the groups of side-scrapers and end-scrapers are dominant (59 per cent). The backed implements are not frequent (7.5 per cent) but they document the Capitan tradition of this complex.

Absence of the geometric types is to be noted. The bifacial point together with some other types (be-
CONCLUSION

Two types of Upper Cretaceous (Nalut Formation) cherts (the coloured and the stripped ones) have been found for the manufacture of implements in the area of Jabal Nefus. The coloured cherts have been manufactured at the Nalut, Jandibah, Bir Mij and Sahabna-sharshara sites and they were intensely transformed into retouched tools. The stripped cherts appear at the Jandibah and Sahabna-sharshara sites, but rather in the group of non-re-
touched artifacts. The raw materials used at the Nalut, Jandibah and Bir Mij sites are partly imported (short-distance transported) and partly of local origin.

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TARHUNAH-SHARSHARA SITE

This site is located 2 km north-west of Tarhú-

nah, 205 m west of the Tarhunah-Sharshara road (Fig. 9).

There is a small rocky plateau on a not-too-high range, running in the north-south direction, and reach-
ing the altitude of 500 m a.s.l. On this plateau there is the rock art site studied by Jellinek (1982b). The engravings were created on the more or less hori-

zontal, upper bedding planes of the rocks. In the vicinity of the engravings, namely on the northern side of the plateau as well as on the north-facing slope of the range, we can find numerous stone tools accompanied by a large number of flakes and cores scattered on the ground surface. The distribution of the artifacts is not regular, they are more concentrat-
ed in some places (workshops).

The raw material, used for the manufacture of the above mentioned sample, is represented by ar-

dicular cherts. The surface of nodules is smooth. The cherts, displaying a very thin (up to 1 mm), whitish outer rim, are very hard, compact and are translucent in splinters, with waxy inclusions and a concho-

idal fracture. Their colour is mostly light- to dark-

grey and brownish to brown but also yellow-brown, pinkish to violet and milky white. The cherts are prevalently structureless (homogeneous structure), sporadically occur cherts with an inhomogeneous irregularly striped structure (alternation of coarse to fine whitish and greyish or brownish to brown bands). One piece have been found having a con-

centrically striped structure, another one showing a dendritic structure (a milky-white chert). The chert implements and fragments display a very thin, whit-

ish, continuous to discontinuous, whitish patina (the white cherts have a whitish patina with a pin-

kish tinge). Few of the artifacts were burnt in fire. Small pieces of the host rock (light-coloured, hard, crystalline limstone) are preserved on the surface of some chert fragments. The cherty raw material from Bir Mij is very similar to that from the Tarhunah-Sharshara site. A few number of tools are made of light-cromatic, fine-crystalline, hard, silicified carve rock. Such tools are usually bigger in size (because of the low quality raw material).

The cherts, as described above, have not been found in the immediate vicinity of the Bir Mij site. Thus, it is necessary to suppose that this raw ma-
terial has been imported from the surrounding area built — in accordance with the geological map by MANN (1975) — of the Nalut Formation (Cenoma-
nian, Turonian) rocks (short-distance transported raw material). This conclusion corresponds with the Nevelle’s observation that the raw material of the lithic industry of the Nalut occupation phases II and III is imported. It is possible to admit that a minority of the raw material (the brown cherts of the oldest phase I1) may be of local origin.

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