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ON THE IMPORT OF THE NEOLITHIC STONE RAW-MATERIAL
FROM THE SUDETY MOUNTAINS AND FROM ŚLEZA

Among numerous problems which could be solved in the course of the interdisciplinary archaeologico-petrographical research, a question of long-distance imports of stone raw-materials from their primary quarries belongs to the most attractive and cognitively important. The basis for the discovery and, consequently, for the description of such features - which occurred in many regions of the world during different prehistoric periods - is provided by the series of selected stone implements of exactly identified petrographic nature, which can be then linked with a quarry of rock with identical characteristics¹. Adequately numerous series of such correlated artefacts permits us to suggest conclusions concerning direction, range, intensity and chronology of the inflow of certain stone raw-material, as well as the identification of cultural groups being its "exporter" and "importer".

Previous studies of the authors resulted in some conclusions of this type. Among 23 implements microscopically defined as basalts, three - representing a type of plagioclase-nephelinitic basalts - show a considerable similarity to the composition of basalt deposits found in the Western Sudeten² and two others - to olivineless Volhynian basalts at the river Horyń in the Rowno region³. None of these samples shows characteristics typical for erratic basalts of Scandinavian origin⁴. Achieved results allow to formulate a hypothesis on the existence in the Neolithic of a long-range import of basalt raw-material from the Western Sudeten and Volhynia to Wielkopolska /Great Poland/ and Kuiavia /distance of about 180-250 kms and 600-700 kms respectively/.

As the next stage of the research program on the Neolithic stone raw-material economy in the Polish Lowlands, from the analyzed collection of 1557 implements found in Midwestern Poland⁵, about 200 artefacts made of gabbro, amphibolite and serpentinite were selected for further, more detailed investigations. The aim of this procedure was to get more precise petrographic description of the rocks, which could be then compared with the internal structure of respective raw-materials known from the primary quarries in the region of Słęża Mountain and in the Sudety Mountains. In the course of several macroscopic observations, 14 implements were chosen to the first stage of the microscopic analyses, on the base of their general macroscopic similarity with the rocks of both areas. Exact microscopic analysis showed that 9 tools were made of amphibolites, 3 - of microgabbros, 1 - of amphibolite gabbro and 1 - of serpentinite. From among these rocks, 1 serpentinite and 5 amphibolite samples origin doubtlessly from Lower Silesia /Dolny Śląsk/. Unfortunately, the origin of the amphibolites cannot be so far localized; it can only be maintained that they undubitably proceed from the Sudety Mountains.

Table 1.

Artefacts made of Sudetian amphibolites

| Item | Type of tool | Site | Voivodeship | Chrono-cultural group | Raw-material |
|------|----------------------|-------------|-------------|--------------------------------------|------------------------|
| 1. | perforated axe | Świniec | Leszno | Danubian Cycle, younger phases | amphibolite |
| 2. | perforated axe | Lubin | Leszno | Corded Ware Culture | epidotitic amphibolite |
| 3. | flat axe | Fusibórz | Poznań | turn of the Neolithic and Bronze Age | zoisititic amphibolite |
| 4. | flat axe | Niemierzycy | Poznań | ? | amphibolite |
| 5. | fragm. of a flat axe | Zagórzyn | Kalisz | ? | amphibolite |

Perforated axe of Corded Ware Culture from Kiszkowo, Voiv. of Poznań⁶, was identified as made of serpentinite. The raw-material arises from Gogołów-Jordanów Massif, which extends south of Słęża Mountain. This type of serpentinite shows macroscopically grey coloration with brownish and greenish shade. It is characterized by the aphanite structure and massive texture. Under the microscope the rock discloses lepidoblastic structure; it consists mainly of minute antigorite flakes which reveal typical chequered structure. Concentrations of coarse xenoblastic grains of carbonates /of calcite, sometimes of dolomite/. These minerals build usually concentrations of the type of pseudomorphs, probably after diallages. Numerous agglomerations of parallel lying grains of magnetite accompany the concentrations of calcite. In places magnetite occurs in form of greater xenomorphic crystals or aggregations. Some of the greater magnetites shine brownish and probably constitute chrome spinel.

In conclusion it can be said that structure, texture and mineral composition allow us to identify the described rock as serpentinite containing carbonate, i.e. carbonate serpentinite. This type of stone raw-material occurs in the whole area of the Gogołów-Jordanów Massif. A particular concentration of carbonate serpentinites was discovered in eastern part of this massif where the process of serpentinitization was more intensive than in its middle and western part. Apart from carbonate serpentinites, the above-mentioned massif is built of antigorite and chrysotile serpentinites. It is situated about 10 kms south of Słęża Mountain where it runs almost evenly with a parallel of latitude at a distance of about 20 kms. Serpentinite rocks uncover in the highest hills which surround the Słęża Mountain in a broad bow from the west, south and south-west. In the western part of the massif a range called Kielczyńskie Hills with the highest summit of 460,8 metres above sea level is situated.

East of the Kielczyńskie Hills, behind the broad depression, appears another range of serpentinite hills - that of Radunia, with the highest top of Sępia Góra /572,9 m/. East of Radunia lie the Tomickie Hills built of serpentinite, with two peaks /196,0 and 252,7 m/. Finally, north of Tomickie Hills another area with serpentinite quarries is known, namely that

of the Nasławskie Hills with the culminations of 190,0 and 201,3 m. All the mentioned serpentinite resources are easy to find in the landscape and to exploit. The raw-material was transported from the massif /most probably from the Tomickie or Nasławickie Hills/ northwards into the Polish Lowland at a distance of at least 190 kms /Kiszkowo near Gniezno/.

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⁵For the description of the collection see: A. Prinke, J. Skoczylas, Neolityczne surowce kamienne Polski środkowo-zachodniej. Studium archeologiczno-petrograficzne /Sum.: Neolithic stone raw-materials of Mid-western Poland. An archaeological-petrographical study/, Biblioteka "Fontes Archaeologici Posnanienses", vol. 5, Poznań-Warszawa 1980 /in print/.

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