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NEOLITHIC IMPORT OF STONE RAW-MATERIALS INTO THE AREA OF GREAT POLAND

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Abstract: This paper is a continuation of several earlier articles by the same authors devoted to the raw-material base of Neolithic stone industry /10; 11; 12; 13; 14; 15; 16; 17; 18/. This topic was considered in the exploitation and distribution aspects, as well as that of the utilisation of rock raw-materials. One of the major problems concerning the distribution of those raw-materials is that of their origin. A group of imported raw-materials is of the greatest importance for archaeologists because they are connected with broader problems of economy, inter-cultural relationships, primitive exchange etc. On the basis of the microscopic analysis carried out by the thin slices method, its was attempted to synchronize the tools of imported raw-materials found in the Lowlamds with the corresponding rock quarries. Next 41 analises were accomplished, disclosing new links of the Neolithic Great Poland with the rock deposits in Lower Silesia /Radunia Mountain - serpentinite and greenstone; import from the distance of 160-200 kilometres/, in the Sudety Mountains /amphibolite from the Kaczawskie Mountains/ and in the Volhynia /basalt; distance of 600-700 kilometres/.

This paper is a continuation of several earlier articles by the same authors devoted to the raw-material base of Neolithic stone industry /10; 11; 12; 13; 14; 15; 16; 17; 18/. This topic was considered in the exploitation and distribution aspects, as well as that of the utilisation of rock raw-materials. One of the major problems concerning the distribution of those raw-materials is that of their origin. A general division of the whole of

petrografically identified raw-materials into three genetic groups has already been accepted. These are: a/ local erratics, found on the surface or in secondary deposits; b/ raw-materials imported from rock-bearing areas south of the Polish Lowlands; c/ rocks from the quarries situated in the Lowlands.

Informations about the group of imported raw-materials /b/ has the greatest importance for the archaeologist because they are connected with broader problems of economy, inter-cultural relationships, primitive forms of exchange, etc. Therefore, on the basis of the results of microscopic analysis carried out by the method or thin sections, it was attempted to synchronize the tools of imported raw-materials found in the western part of the Polish Lowlands with the corresponding rock quarries /Fig. 1/

In former publications it was documented that there existed import of basalt /of plagioclase-nepheline variety/ from its parent deposit in Leśna near Lubań Slaski /fig. 2, no 1/ to the Piła area /the distance of ca 250 kilometres/ and of olivine-less basalts from Janowa Dolina, Micko and Berestowiec in Volhynia to the Western Kuiavia area /fig. 2, no.3; the distance of ca 700 kilometres/. In this paper we discuss the results of the microscopic analysis of another group of stone tools from the area of Mid-Western Poland, which made it possible to accomplish a further synchronization of this kind.

The microscopic research of a series of 41 tools /table 1/ was carried out in a polarizing microscope POLAM-133 without additional instruments. The results obtained constitute material enabling one to verify the former hypotheses about the southern and eastern origin of the Neolithic stone raw-material. Uniform results, confirming the import of serpentinite from the Gogołów-Jordanów massif /fig.2, no 2/ were obtained from the microscopic examination of two tools: from Sekowo /Nowy Tomyśl commune; no. 25 on the fig. 1 and on the table/ and from Wargowo /Oborniki comm.; no. 26/. They were made of serpentinite rocks described as roddingite and wehrlite respectively. Roddingites with the given mineral composition are most frequently found in the

closest environments of Jordanów in Lower Silesia, while serpentinized wehrlites and herzolites also occur in the serpentinite Gogołów-Jordanów massif, but in its middle part, near Radunia Mountain /7; 8; 9/. Therefore, the data presented confirm the authors' hypothesis about import of this raw-material from the Gogołow-Jordanów massif to the area of Great Poland /10; 11/. This hypothesis was put forward on the basis of microscopic examination of the axe of Corded Ware Culture from Kiszkowo /no. 31/. It was additionally confirmed by the discovery of prehistoric sites of exploitation of this raw-material made by W.Wojciechowski on the slopes of Jańska Góra in the serpentinite massif of Gogołów-Jordanów./20/. Recently found new instances of import of serpentinite to the Nowy Tomyśl area in the Danubian Cycle and to the vicinity of Oborniki in the Corded Ware Culture indicate a long term existence of this import to vast areas of Great Polish Lowland. While the transport of rock material from the Gogołów-Jordanów massif to the area of Kiszków near Gniezno and the vicinity of Oborniki to the north of Poznań was taking place on the distance of about 190-200 kilometres, the transport to the area of Nowy Tomyśl covered about 160-170 kilometres.

Less uniform results concerning the sources of the imported rock raw-material were obtained during the examination of thin sections from the tools made of amphibolites. In the case of two specimen, i.e. the Funnel Beaker Culture axe found in Kraplewo /Steszew comm.; no.22/ and the Danubian Cycle/?/ adze from the vicinity of Nowy Tomyśl /no. 23/, it is possible to state that the rocks come from Sudety Mountains, and, in the second case, the region of Sudetian tectonic foreland cannot also be excluded. Because of a large number of places where amphibolites occur in the Sudety and their tectonic foreland, it is difficult to point to any given deposit of amphibolite rocks as those used for making the tools described.

Also in the case of the axe from Babia Góra /Kołło comm.; 7/, made of greenstone, there is a justified conviction that that rawmaterial came from the area of the Kaczawskie Mountains

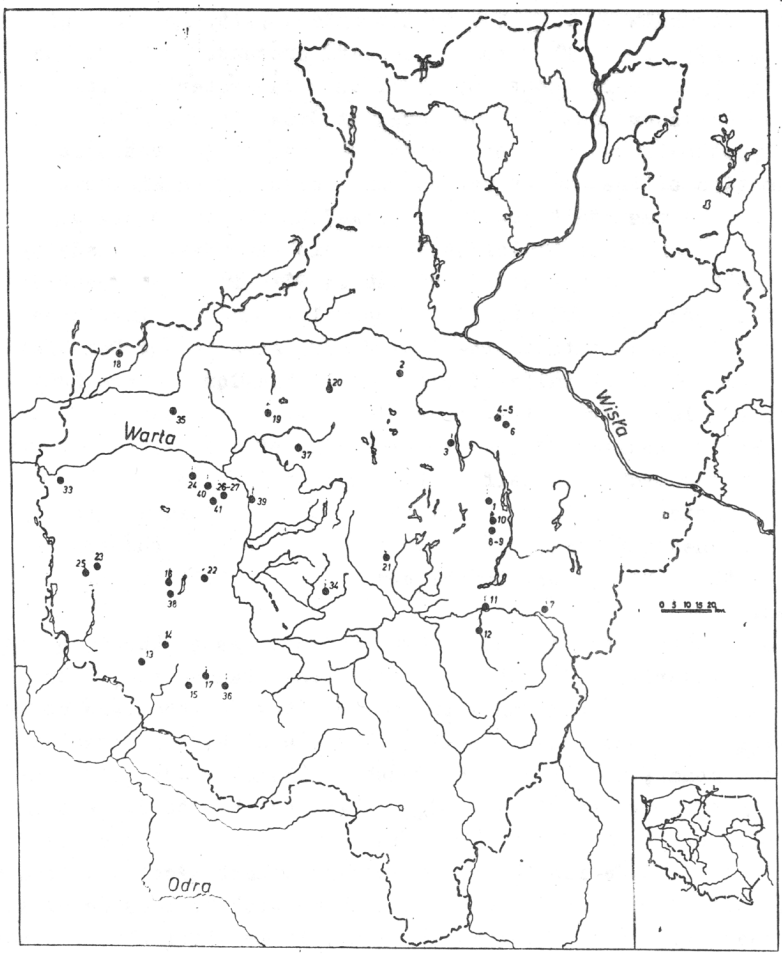

Fig. 1. Location of microscopically examined stone tools from Mid-Western Polish Neolithic.

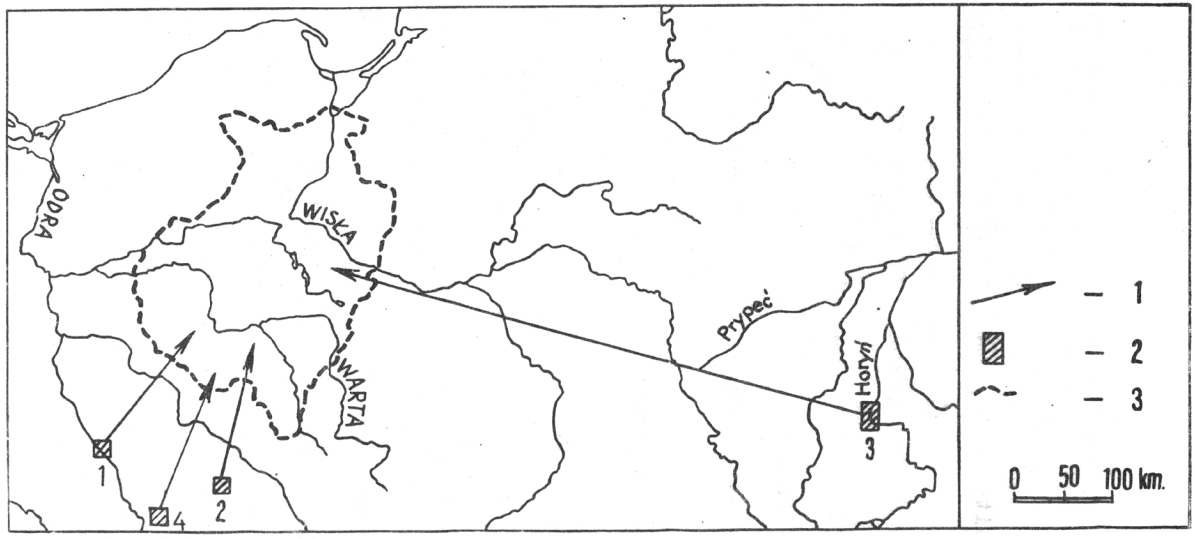

Fig. 2. Directions of influx of the imported rock raw-materials into the area of Mid-Western Poland. 1 - direction of influx; 2 - location of identified quarries; 3 - border of examined territory of Mid-Western Poland.

Table 1.

List of petrographic determinations of the Neolithic stone tools from Mid-Western Poland /results of microscopic analysis/

No. on the map	Locality /commune/	Culture	Petrographic determination
1.	Budy /Jeziora Wielkie/	Funnel Beaker Culture	uralitized microgabbro
2.	Górki Zagajne /Gorzyce/	" "	coarse-crystalline amphibolite
3.	Jankowo /Pakość/	Neolithic	microcrystalline amphibolite
4.	Szadłowice /Gniewkowo/	Funnel Beaker Culture	metabasalt
5.	" "	Neolithic	basalt
6.	Zelechlin /Rojewo/	"	uralitized microgabbro
7.	Babia Góra /Koło/	"	greenstone
8.	Skulsk /Skulsk/	"	basalt
9.	" "	Funnel Beaker Culture	microgabbro
10.	Mniszki /Skulsk/	" "	quartzite microgabbro
11.	Przydziałki/Konin/	Danubian Cycle -younger phases	basalt
12.	Stare Miasto/Konin/	Final Neolithic	leukoamphibolite
13.	Barchlin /Bucz/	Corded Ware Cuktzre	microgabbro
14.	Czacz /Smigiel/	Neolithic	prasinite
15.	Spławie /Stare Bojanowo/	"	metabasalt
16.	Strzępiń /Granowo/	"	uralitized norite gabbro
17.	Wonieść /Stare Bojanowo/	"	paleobasalt
18.	Dzierzazno /Wieleń Pln./	"	basalt

Table 1 cont.

No. on the map	Locality /commune	Culture	Petrographic determination
19.	Zelice /Wągrowiec/	Neolithic	basalt
20.	Czeszewo /Gołańcz/	Corded Ware	metabasalt
21.	Jaworowo /Witkowo/	Neolithic	amphibolite
22.	Kraplewo /Steszew/	Funnel Beaker Culture	"
23.	Nowy Tomyśl /Nowy Tomyśl/	Danubian Cycle	amphibolite with epidote
24.	Popówko/Oborniki/	Neolithic	basalt
25.	Sekowo /Nowy Tomyśl/	Danubian Cycle	roddingite
26.	Wargowo/Oborniki/	Neolithic	basalt
27.	" "	Corded Ware Culture	serpentinized wehrlite or herzolite
28.	Swiniec /Krzywin/	Danubian Cycle -younger phsae	amphibolite
29.	Lutogniew/Krotoszyn/	" "	amphibolithic gabbro
30.	Koziegłowy/Kleczew/	Neolithic	amphibolite
31.	Kiszkowo/Kiszkowo/	Corded Ware	carbonate serpentinite
32.	Zagórzyn/Dobrzec/	Neolithic	amphibolite
33.	Miedzychód/Miedzychód/	Final Neolithic	"
34.	Rusibórz /Dominowo/	Neolithic	zoisite amphi - bolite
35.	Wilczak /Lubasz/	Final Neolithic	amphibolite
36.	Lubin/Lubin/	Corded Ware Culture	epidote amphibolite
37.	Losiniec Nowy/Skoki/	Neolithic	" "
38.	Niemierzyce/Granowo/	"	" "
39.	Bolechowo/Czerwonak/	Funnel Beaker Culture	microgabbro
40.	Objeuierze/Oborniki/	Danubian Cycle -younger phases	"
41.	Kowalewko/Oborniki/	Corder Ware Culture	"

/fig. 2, no.4/. Further and more detailed petrographic research may in this case determine more precisely the region of the Kaczawskie Mountanis where this rock was exploited in the Neolithic.

None of the presently examined basalt tools come from the Sudety. Also the possibility of occurring of these basalts among erratics should be excluded because of the different structure of Scandinavian basalts /only one deposit in Langenäbbe, Scania, does not contain olivine: however, it is the glass basatl, containing ca 53 % of glass, 14 % of plagioclase, 18 % of augite and 15 % of magnetite; 4/. Only the raw-material of one tool, namely that from Wonieść /Stare Bojanowo comm.; 17/ seems to be similar in the mineral constitution as well as in the structure and texture, to the Volhynian basalts /6/. Some similarities with that type of basalts indicate also: the axe fragment from Szadłowice /Geniewkowo comm.; 5/ and from Spławie /Stare Bojanowo comm.; 15/. The authors have at present too little of comparative material to their disposal to determine precisely the exploited Volhynian quarries as well as to indicate the origin of the remaining olivine basalts. A preliminary comparison seems to indicate that the deposits of these rocks should be looked for in Bohemia /Ceske Středohoří and Doupovsky hory/ and in Slovakia /e.g. Chavalenska Valley: 2: 3; 19/.

Further research on the Neolithic import of basalts to the Great Polish Lowland in collaboration with Czechoslovakian geologists will make it possible to verify the authors' last hypothesis.

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