



Peculiar abiotic raw material types used in the Stone Age for implements construction (territory of Slovakia)

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Abstract. For all three main prehistorical time-periods on the territory of the Slovak Republic e. g. Palaeolithic, Neolithic and Aeneolithic, except of "common" also peculiar abiotic raw material types are characteristic. In paper their characteristics are presented. Following raw material types are considered to be peculiar in: a) Palaeolithic: silicified volcanics, acid metavolcanics, b) Neolithic: jadeitite, Al-rich spinel-anthophyllite-hornblende schists, simplectite eclogite, almandine-omphacite eclogite, plagioclase-clinopyroxene hornfels, limy mudstone, terra rossa, c) Aeneolithic: soapstone/talcite, sapropelite, clays as raw material of axes.

Key words: Stone Age, peculiar abiotic raw material types, Slovak Republic

Introduction

During the very last years in the frame of national as well as international (IGCP/UNESCO 442) projects several tens of raw material types have been identified from archaeological sites on the territory of the Slovak Republic. As the objects of petroarchaeological studies we used implements from several museums collections together with the implements from the deposits of the Archaeological Institute of the Slovak Academy of Sciences in Nitra. Partial results of not yet finished studies, using standard laboratory methods of petrography and mineralogy, have been published by the author and co-authors in several scientific journals. Review of the present-day knowledge to the end of 1999 was presented in paper by Hovorka & Illášová (2000). Since the mentioned time on the territory of Slovakia several peculiar raw material types of abiotic character have been identified. In this paper peculiar raw material types will be presented according to the archaeological ranking of implements made of such raw material types.

It ought to be mentioned that peculiarity in the case of raw materials defined represent:

- a) raw materials from the very distant or unknown sources,
- b) raw material not being standardly used for implements make, or very seldom occurring raw material types.

Peculiar abiotic raw material types are characterized according to chronological division of the pre-historic time.

PALAEOLITHIC

In accordance with the whole continental Europe trend, radiolarites, flints, cherts and acid volcanic glass (obsidian), also on the territory of the Slovak Republic

mentioned raw material types have been leading ones during the Palaeolithic. But except of those there were documented several unusual/peculiar raw material types found as ready made implements on various archaeological sites.

Silicified dacitic and andesitic volcanics

have been documented during excavations of cave Prepoštská jaskyňa in Bojnice (Bárta 1980). Our consequent recognition studies confirms Bárta's identification and description. Discussed stone implements are deposited in Ethnographic Museum of the Slovak National Museum in Martin and in museum at Prievidza.

Silicification in the case of discussed implements raw material is hydrothermal postvolcanic process bound to the Late Tertiary volcanic activity forming surface/sub-surface geological formations of the Vtáčnik Mts. located in „one day walking distance“ of the place of implements discovery. The wealths of implements found in mentioned Palaeolithic site is due to the presence of thermal mineral springs - and consequently non freezing water in the river Nitra - which was the place of crowds of deers and other big animals stay during cruel winters in the Last Ice (würm) Period.

Acid metavolcanics

(originally described as „porphyroids“ by Mišík 1975) have been identified as the raw material of implements found on wellknown site Moravany nad Váhom. Taking into account geological situation in the adjacent mountain ranges (e. g. the Považský Inovec Mts. and the Malé Karpaty Mts., as well) where such rock are not known, we suppose that pebble of mentioned rock was one pebble type forming so called exotic conglomerates of the Pieňiny Klippen Belt in the river Váh valley.



Acid metavolcanics and metavolcaniclastics are widespread among Early Palaeozoic complexes of the generic unit (inner Western Carpathians) located at least 250 km to the east of the place of implement of the given type discovery.

Following the Mišík's (l. c.) description given raw material type has both, e. g. relic magmatic as well as the younger metamorphic fabrics. The first one are represented by magmatically corroded feldspars and quartz phenocrysts, meanwhile metamorphic features are documented by recrystallization of magmatic minerals, recrystallization of probably glassy groundmass, and well pronounced metamorphic foliation. Foliation planes have been used by implements makers as natural long sides of the given implement.

NEOLITHIC

Geological units forming continental Europe from the aspect of the rock filling are significantly different. So also raw material types, namely those of the local provenience, differ from place to place. Based on this, among peculiar raw material types we rank those, which do not occur on the territory of the Slovak Republic, or are not part of geological sequences of neighbouring geological megaunits.

Jadeitite

belonging to the most exotic raw material type has been identified (and consequently studied in detail using electron microprobe: Hovorka et al., 1998) as the raw material of small flat non-bored axe from the western part of the Slovak Republic. The axe has been slightly damaged on the but end. Comparing mineral composition (almost monomineralic rock composed of stoichiometric jadeite) as well as fabric features we are keen to joint it with the set of axes made of the just the same raw material which have been described from several Moravian (easternmost part of the Czech Republic) localities (Schmid & Štelcl, 1971). As in the whole western sector of the Carpathian Arch as well as in the Eastern Alps no jadeitite occurrences are reported to occur, the provenience of this exotic raw material type is not yet known. The nearest very small occurrences are listed from the Eastern Sudetes of the Poland territory. In the Eastern Alps there do occur such rock bodies which supplied coarse detritic material for numerous implements described from the Po basin or northern Italy, generally (D'Amico et al., 1995).

Al-spinel-anthophyllite-hornblende schists

as the raw material of flat, non bored axes have been described from several sites located in the western part of the country. Their petrological character as well as the origin of the given raw material type of this peculiar character have been subject of paper by Hovorka et al. (1993). Since the time of above paper discussed raw material type have been found as the raw material of the mostly lengyel

culture flat, simple, mostly non-bored axes. Characteristic is the distribution of implements of mentioned raw material type in the western part of the country and in north-western part of Hungary (Gy. Szákmány, personal communication, 2000).

Based on studies in detail (l. c.) and realised electron microprobe studies of the rock forming minerals the character of this raw material type should be summed up as follows.

Schists of discussed type have slightly up to well pronounced metamorphic foliation. Except of phases given in the rock-name there is also accessory amount of olivine, Mg-chlorite, magnetite, and in some cases also clinopyroxene-group minerals.

Characteristic is apple-green Al-rich (60-62 % of Al_2O_3) spinel of irregular morphology concentrated in rectangular or lense-shaped parts of individual thin sections. So we suppose Al-rich spinel to be the product of breakdown of an original (magmatic?) phase rich in alumina. In mentioned rectangular, or lense-shaped portions, green spinel reach up to 40 %, in individual thin sections up to 20 % of the total mineral association

Simplectitic eclogite

has been identified as the raw material of small non-bored hammer-axe from site Nitriansky Hrádok (Hovorka & Illášová, 1996). This raw material type is not known from the Western Carpathians, as well as from the northern ridges of the Eastern Alps, which supply rivers (Danube and its tributaries) flowing to the north, by gravels. On the southward oriented Eastern Alps valleys there occur alpine-type eclogites with no significant traces of retrogressive recrystallization, which is characteristic petrological feature of the eclogite under consideration. So several geological units of the Bohemian Massif should be taken into consideration as the possible source of the simplectitic eclogite raw material type. But also in this case river pebble transport from the Bohemian Massif to the Danube river should be the most probable. Site Nitriansky Hrádok is located some 40 kms from the Danube river, which distance is traceable by the river Nitra as the communication path.

Almandine-omphacite eclogite

Also this raw material type is represented by one bored flat axe from the site Svodín, which represents one of the most typical lengyel culture sites.

For the raw material under consideration characteristic is shape of present garnets: they more-or-less all have atoll-like morphology. Chemical composition of garnet and stoichiometric omphacite, together with the low amount of amphibole, indicate insignificant retrogressive recrystallization of original high-pressure rock. This peculiar raw material type is described in detail (microprobe analyses of rock-forming minerals included) in paper by Spišiak & Hovorka (in print).

Also in this case we consider Bohemian Massif to be the source of this raw material type. Eclogites of similar

characteristics (e. g. atol-like almandine) are known to occur namely in the Marianske Lázně metabasite complex in the southwestern part of the Massif. As this geological unit is drained by brooks and rivers of the Elbe provenance, the dry land transport is the most probable in this case.

Plagioclase-clinopyroxene hornfels

have been described in the very last time (Hovorkas et al., in print). Those very fine-grained rocks of massive diablatic pattern, composed of mentioned two main mineral phases, are the raw material of morphologically just the same 4 axes from the site Svodín. They are flat, non bored, small. Identical microscopic pattern indicates one block to be the actual raw material of which on the site of discovery, mentioned 4 axes have been made.

Though such plagioclase-clinopyroxene hornfels are not described in the frame of Late Tertiary volcanic province, we consider contact-thermic origin of mentioned raw material. Thermal supply for thermic recrystallization has been given by a volcanic body. From it involved block should have been liberated and as appropriate raw material should have been gathered on slope formed by the products of the Late Tertiary volcanic activity, or directly as the block in the river Hron valley sediments.

Identity of the raw material of described type in the case of 4 small axes from site Svodín indicate their construction from the just one (identical) block of the source material on the site of their finding.

Limy mudstone

represents leading raw material on the lengyel culture site Šarišské Michaľany (eastern Slovakia). It represents typical local raw material. Numerous outcrops in the brook are located several hundreds meters of mentioned large settlement.

Limy mudstone is member of the Palaeogene rock sequences, which form filling of the Tertiary basin. This rock type is a member of the flysch sequence along with fine-grained sandstones, clays and conglomerates, respectively. Relative hardness of the give rock-type is the consequence of described raw material mineral composition (e. g. quartz of silty fraction, clay minerals and calcite) on one, and their fine-grained character on the other side. Description in detail of this raw material type is presented in paper by Banská et al. (1998).

Limy mudstone served as the raw material for axes, hammer-axes, chisels, crushers ao. construction.

Terra rossa

as the raw material used for ceramic production is known from the Domicia cave, which represents one of the most typical lengyel culture site not only on the territory of Slovakia, but elsewhere. Terra rossa represents residual material after chemical weathering of carbonate complexes, which were high in iron. Iron oxides act as color (red) pigment. This pigmentation didn't disappear after

the ceramic production, its final technological stages treatment in fire included. As terra rossa should be classified as low quality iron ore, for a ceramic production appears to be peculiar raw material type. Except of the Domicia cave similar/identical type ceramic has been found also in the other caves located in the Juhoslovenský Kras (Karst) area.

AENEOLITHIC

Daily activities of people in the Aeneolithic became more complex and in several aspects some of them start to be specialized. Patrilinear relations in human communities replaced matrilinear one, which has been leading in the past. Simultaneously "vertical" stratification inside individual tribes brought the need of new raw material types for ornamental/symbolic purposes, or as documents of power or exceptional social position. Mentioned newly developed internal social stratification needed new raw material types to express some social aspects inside individual communities. So Aeneolithic represents time-period, in which man returned to the use of raw material types known from the Palaeolithic on one side, and simultaneously use of a new raw material types on the other one.

Soapstone/talcite

has been identified as being raw material of one non-bored flat axe found on fields close to the Senica town (western Slovakia: Illášová & Hovorka, 1995).

Raw material described is pronouncedly soft. In mineral composition fine-flaky talc dominates. Except of this leading phase also Mg-chlorite, carbonate and ore minerals are present in accessory amounts. On the described implement no traces of practical use have been observed.

As in the westernmost located Western Carpathians core mountains no such rock types are listed, it is the most probable that provenance of soapstone/talcite should be geological units forming NE rim of the Bohemian Massif, wherea namely in the Merta river valley several such rock-bodies are known to occur.

Sapropelite

represents raw material of ornamental rings and the other decorative small artefacts. By its nature sapropelite represents raw material of mixed (organic-anorganic) origin. This raw material type is actual mixture of organic material intimately mixed with the clay portion. They quantitative proportions change from seam to seam. It is relatively soft, well and simultaneously easy workable material which accompany the majority of coal seam in coal basin of namely Neogene in age.

Ornamental artefacts made of sapropelite have been found on the territory of the Slovakia sporadically only. They have not been studied in detail yet. Artefacts of described type have been described on several sites in the central part of the Czech Republic. So import of this raw material type or ready made implements from mentioned province is probable.

Clays as the raw material of axes

Are documented from several Aeneolithic sites from the western Slovakia (Točík et al., 1970). In this case clays-made axes served not for practical, but symbolical denomination. Clays-made axes bears morphology of the most widespread types of the Neolithic axes (e.g. lengyel culture axes). Actual composition of original clays, and their provenience respectively, has not been studied yet.

CONCLUSION

Through the whole prehistoric time-period tribes living in the territory of the nowadays Slovak Republic besides common raw materials of the abiotic nature from time-to-time and place-to-place used also peculiar raw material types. The peculiarity is expressed by: a) unusual raw material types used in given time-period (silicified volcanics and acid metavolcanics in the Palaeolithic), b) in nature seldom occurring rock-types used as the raw material of individual implements (jadeite, almandine-omphacite eclogite with atol-like garnets, plagioclase-clinopyroxene hornfelses in the Neolithic), c) raw material with unfavorable technical properties (limy siltstones in the Neolithic and soapstones in the Aeneolithic), d) raw materials which are not known in the form of geological bodies namely in the central Europe (Al-rich spinel-anthophyllite-hornblende schists in the Neolithic). For the identification of mentioned peculiar raw material types modern laboratory methods have been used.

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