Journal of Geology, Geography and Geoecology

Journal home page: geology-dnu-dp.ua

ISSN 2617-2909 (print)
ISSN 2617-2119 (online)

Journ.Geol.Geograph.
Geoecology,
27(1), 108-115
doi: 10.15421/111836

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Journ.Geol.Geograph.Geoecology, 27(1), 108-115

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Received 03.04.2018;

Received in revised form 10.05.2018;

Accepted 03.05.2018

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Petrographic research of the Eneolithic-Bronze Age stone stelae from Poltava Museum of Local Lore

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Abstract. The purpose of the article was to define the material provenance of stone stelae dated to the Eneolithic and the Bronze Age (4th – 2nd millennia BCE) from Poltava Museum of Local Lore named after Vasyl Krichivsky. Moreover, the aim was to ascertain possible areas of stone mining. The research was performed using mineralogical and petrographic methods. The study of rocks was carried out in thin sections using a polarizing microscope. To obtain more accurate data about clayey cement of sandstone, an XRD analysis of extracted and precipitated cement material was conducted. The provenance of the stone materials was established by comparison of determined petrographic features of rocks with characteristics of similar rocks from outcrops and modern mining sites, as well as data from geological survey reports and the petrographic literature. A comparison with thin sections of stone stelae dated to the same epoch from Dnipropetrovsk National Historical Museum named after D. I. Yavornytskyi and Horishni Plavni Museum of Local History was also performed. There were five statues studied, among which three were found in the south-west of Poltava Oblast (Kobeliaky and Kremenchuk Raion), one in the south-east of the Oblast (Karlivka Raion) and one with unknown place of finding. Petrographic research established that the statues from the south-west of Poltava Oblast, as well as the stela with unknown origin, were made from plagiogranite (biotite trondhjemite). The statue from the south-east of Poltava Oblast, the so-called Fedorivskyi Idol, was produced from sandstone (quartz arenite with argillaceous and siliceous cement). The granites have very similar petrographic features and could have originated from the same area. The area in the south-west of Poltava Oblast, the Dnieper River valley in the vicinity of the city Kremenchuk, belongs to the zone of the Ukrainian Shield, where similar Precambrian plagiogranites are exposed. The material of the studied statues is also similar to the granites of stone stelae from Horishni Plavni museum that were discovered in the same area.

Therefore, we can conclude that granite statues are most likely to be of local origin from the south-west of Poltava Oblast. The comparison of the sandstone stele material with the collection of sandstones from the Dnieper Left Bank area showed that it has no analogues among local species of such rocks. On the other hand, similar rocks were established in the collection of Carboniferous sandstones of Donbas from the collection of the Institute of Geotechnical Mechanics named after M. S. Poliakov. The important fact is that the material of the Fedorivskyi Idol is very similar to the sandstone of the known Kernosivskyi Idol from Dnipropetrovsk Oblast. Thus, the sandstones from the Donets Ridge (central Donbas) were mined and transported outside the mining area. The eastern boundary of their distribution zone is suggested by the places of the Fedorivskyi and Kernosivskyi idols' discovery. Westward, in the Dnieper River valley area, the Bronze Age population used local granites.

Keywords: archaeological petrography, stone stelae, Eneolithic, Bronze Age, Poltava

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