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Flint raw material transfers in the prehistoric Lower Danube Basin: An integrated analytical approach

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ABSTRACT

The paper presents results of a research programme focused on the provenancing of flint raw materials used in the prehistory of the Lower Danube Basin of the Balkans. Field survey encompassed two adjacent regions connected by the Danube River. First, northern Bulgaria where rich flint-bearing Cretaceous deposits are known along with numerous Neolithic sites but with limited pre-Neolithic presence apart from several well-known Middle to Upper Palaeolithic sequences. Second, the Danube Gorges area on the southern, Serbian side of the river, characterized by relatively scarce deposits of flint, but with one of the best preserved concentrations of Mesolithic, transitional and Early Neolithic sites in the wider region of southeastern Europe. Focusing on both of the two selected regions allows one to follow diachronic dynamics in supply and circulation of local and non-local flint raw materials along the examined stretch of the Lower Danube Basin. In order to connect surveyed flint outcrops and different types of raw material used in archaeological contexts, an integrated approach was employed using both petrographic thin sections and LA-ICP-MS trace element chemical finger-printing analyses.

1. Introduction

For all prehistoric periods, the study of flint raw material transfers offers archaeologists one of the best proxies for human mobility, attesting to networks of exchange, sometimes between distant communities, or indicating direct procurement over long distances (e.g., Belardi et al., 2015; Boulanger et al., 2015; Floss, 1994; de Grooth, 1997; Huckell et al., 2011; Lech, 1990, 1997; Nash et al., 2013; Pettitt et al., 2012; Speer, 2014; Zimmermann, 1995). Yet, depending on scholarly traditions, some of the European regions have seen more intense research than others. For instance, southeastern Europe remains an underexplored region regarding flint provenance studies. A notable exception to this general rule is the Lithotheca of the Hungarian National Museum in Budapest, Hungary (Bíro and Dobosi, 1991; Bíro et al., 2000), containing a rich collection of comparative specimens of flint raw materials from the Carpathian Basin and beyond, serving as an important point of reference. In order to fill this research gap, in 2011, two of us (MG and DB) initiated a programme of fieldwork and archaeometric analyses primarily focused on two adjacent regions of the Balkans — northern Bulgaria and northeastern Serbia (Fig. 1). These regions are connected by the Danube River and have given indications of possibly intense movements of people and objects along this major transitory axis in different prehistoric periods. In this paper, we present preliminary results of our study in identifying flint sources used by prehistoric communities of these areas by employing new fieldwork, thin-section petrographic analyses and LA-ICP-MS chemical finger-printing.

A number of flint sources in Bulgaria are well-known and have previously been described in the archaeological and geological literature (e.g., Nachev and Kanchev, 1984; Nachev and Nachev, 1988). Four distinct types of flint in Bulgaria have been recognized: Hemus flint, Dobrudzha flint, Moesian flint and Rhodope flint (Nachev, 2009). Each type has a different geographical distribution, geological age and macroscopically diagnostic features (Fig. 1) (Gurova and Nachev, 2008: Fig. 5). While the perceived quality of stone raw materials used for knapping is not necessarily a precondition for the production of a desirable debitage (e.g. Archer and Braun, 2010; Eren et al., 2014), the mineralogical

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Fig. 1. Map of the Lower Danube region showing flint-bearing rocks in Bulgaria and eastern Serbia and geological/primary and secondary raw material outcrops (hexagons with names in italics) and archaeological (triangles with names in italics) sites. The dotted lines indicate boundaries between tectonic zones. Sources for flint-bearing rocks: for Bulgaria, Gurova and Nachev, 2008, Fig. 5; for Serbia, geological maps (Base map by Marko Milošević). 1. Conglomerates, sandstones, argillaceous schists, Dover (D); 2. Upper Jurassic limestones (Oxfordian age) with siliceous concretions (J_3^{ox}); 3. Low Cretaceous (Aptian age) limestones with siliceous concretions (K_1^a); 4. Flysch: thin-bedded limestones, marls and shales (Valanginian and Hauterivian) (K_1^{1+2}); 5. Marls, marly limestones and limestones with chert nodules (Hauterivian) (K_1^2); 6. Upper Cretaceous chalk and chalk-like limestones (Campanian and Maastrichtian age) with siliceous concretions (K_2^{cp-m}); 7. Upper Cretaceous volcanogenous rocks (Coniacian, Santonian and Campanian ages) in Sredna Gora Zone (K_2^{Cn-Cp}) — Sredna Gora atypical flint; 8. Chalcedony veins in Oligocene volcanogenous rocks in Rhodope Zone (Pg_3) — Rhodope atypical flint.

comparison of these four types distinguishes Ludogorie (called also Dobrudzha) flint as the most suitable material for knapping (judging by the homogeneity of the raw material and conchoidal fracture pattern) — the unique homogeneity and the size of the nodules permits core preparation and large laminar blanks debitage. The most significant accumulations of siliceous concretions occur on the Moesian Platform and adjacent parts of the Balkan Alpine Orogen. The main lithostratigraphic horizons in which these occur are of Lower Cretaceous (Aptian) and Upper Cretaceous (Coniacian, Campanian and Maastrichtian) age. Both series are represented on the Moesian Platform in northern Bulgaria. The most recent research on the topic has suggested that the area of flint-rich rocks along the Moesian Platform spreads across northern Bulgaria and that it might have been the main acquisition zone for regions farther to the west, i.e. the central and northern Balkans:

> The Upper Cretaceous flint-rich rocks formed three large areas of outcrops in North Bulgaria (the Moesian Platform and adjacent parts of the Balkan Alpine Orogen), from West to East as follows: the first one between Montana and Lovech, the second — between Pleven and Nikopol and the third — between Shumen and Devnya. In this big territory Moesian flint has large distribution and has formed big deposits. Throughout this big area the Moesian flint has similar features. Only in the Pleven–Nikopol region the Moesian flint is hosted in non-deformed rocks. That is why the flint from these outcrops has a better quality [for knapping purposes]. This fact and the convenient transport connection along the Danube River, determined the big outcrops on the Danube coast near Nikopol and Somovit as the most probable source of flint raw materials for vast territories in Serbia and Romania (Gurova and Nachev, 2008: 34).

2. Archaeological background

Questions about long-distance trade and acquisition of flint from the Moesian Platform in northern Bulgaria relate to two archaeological problems: first, our understanding of long-distance exchange/trade or direct procurement of raw materials in prehistory in general; and, second, the special place in this exchanges of the so-called high-quality yellow-waxy and white-spotted flint also known as “Balkan flint”, the lithic raw material abundantly used for the manufacture of chipped stone artefacts and considered one of the diagnostic features of the spread of Neolithic farming communities across the eastern and central Balkans and parts of the Carpathian Basin. Since the 1970s, a view emerged that this distinctive flint originated from the so-called “Pre-Balkan Platform” (Moesian Platform) in northern Bulgaria from where it was distributed to neighbouring regions across southeastern Europe (Kozłowski and Kozłowski, 1984; Voytek, 1987). The “Balkan flint” problem especially relates to the supra-regional Karanovo I–Starčevo–Körös–Criş taxonomic unit of the Early Neolithic in southeastern Europe. The question of “Balkan flint” provenancing is inherently linked to the Neolithization debate. In spite of decades of research on the origins and spread of the Neolithic in the Balkans, it has proved difficult to offer a firm identification of “Balkan flint” source(s) in the Moesian Platform and to explain the appearance of standardized (formal)