Archaeology of Iron ore mining and metallurgy on the Lower Danube and Balkan range area (Roman Imperial period – end of 18th c.).

(Abstract)

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This book is devoted to an extremely important but often underestimated aspect of the development of old Balkan economy, namely iron ore mining and metallurgy as an integral part of it. The analysis of archaeological, historical and ethnographic research, combined with approaches to analytical chemistry and geoarchaeology, allows for additions, upgrades and the creation of new models for the functioning of the old iron industry. The monography is intended primarily for specialists in Roman, late antique and medieval archeology and history, but also for students and a wider range of readers who are interested in the ancient economy and the system of exchange. The geographical scope is consistent with the current ancient and medieval geography.

The investigation is structured in five main parts with a preface, conclusion, bibliography and illustrations and maps included.

In order one to achieve the objectives of the study, three scientific approaches have been applied - archaeological, chemical and geological. Archaeological approach includes a detailed bibliography of the study area and the search for similar situations on the problems of ancient iron mining in the Balkans and Europe; collection of surface material after covering the maximum perimeter research through conventional field research (archaeological field surveys), which according to their methodology are of two types - extensive and selective archaeological field surveys. As part of archaeological approach is the localization of alternative routes through mountainous areas, used as direct routes for the transport of raw materials and gradually transformed into major roads under political and economic conditions. The obtained data were placed into GIS environment, which on the basis of already collected spatial data on the archaeological sites in the area makes it possible to obtain new information about missing or undetectable archaeological structures and potential raw materials. For the purposes of chemical research, sets of movable materials from studied and unexplored archeological sites have been collected through field surveys for analysis, most of which are metallurgical and blacksmith slags. The materials were subjected to three types of analysis, two of which are multi-element, non-destructive and characterized by speed and simplicity of analysis. The third was used to determine the main components (Cu, Ni, Co), microcomponents (Sn, As, Pb, Sb), as well as traces of elements (Zn, Se, P, Mn). Geological surveys are based on the collection of geological samples for the purpose of tracing raw material centers (1). Search for the main sources of raw materials and mineral resources in the study area; establishing the location of ancient quarries, mines, water sources, etc., which is important for the restoration of the ancient economy and the factors determining the emergence, disappearance or transformation of populations and agglomerations (2.) and 3. use of GIS to systematize the information collected into geobase system.

For the purposes of a study called "Archaeology of Iron ore mining and metallurgy on the Lower Danube and Balkan range area " it is necessary to include the scarce empirical material inside general political and socio-economic processes, which justifies the many references to ethnographic and demographic data.

Ultimately, the theoretical and practical interdisciplinary research conducted in the Lower Danube and Stara Planina region leads to the following general and contributory conclusions: 1. Accessory magnetite in the form of sand deposited as a result of denudation activity on the slopes facing the currents of water sources of various categories, as well as ebbs in their beds, is the main raw material for iron development in antiquity, the Middle Ages and pre-modern times.

2. The identified mining and metallurgical processing sites shall not be limited to meeting regional iron requirements, but shall have the capacity to supply semi-finished or finished products to centers which, through their resources, complement the economic exchange system. 3. In the micro-regional aspect, the extraction-reduction-processing relationship varies due to the general political and economic relations. Archaeological contexts compared to the chemical analysis of specimens practically confirm the assumption based on analogies that this connection is not always easy to establish and this is possible only through interdisciplinary research.

4. The iron and steel industry is a socio-economically complex process, dependent on the human potential inhabiting the landscapes concerned. The development or decline of this activity affects the general economic and social profile of the population on a regional and supraregional scale.