BRONZE AGE CERAMICS AND SLAG FROM THE LĂPUŞ NECROPOLIS (NW ROMANIA)

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The Bronze Age (13th–12th century BC) necropolis and cult area from Lăpuş is situated in NW Romania. Large amounts of potshards as well as scattered slag pieces were found in a multi-phased cult building in the center of the necropolis as well as in burial mounds. The ceramic shards are interpreted as intentionally destroyed vessels during funerary celebrations as an act of ritual violence. The potshards display a large range of colours (from creamy, orange or red, to grey or black) and fabrics (from coarse to semifine, rarer fine). Signs of burning, such as cracked black surface, partial melting and deformed shape, are not uncommon. For comparison and provenance study, samples of soil and daub, ceramics and slag were mineralogically and chemically analyzed by optical microscopy, electron microprobe (EMPA) and ICP-MS.

Here we will focus on the chemical similarities and differences among these categories, i.e. "clay" (including soil and daub), slag and ceramics. Questions which should be addressed by chemical investigation include the relation between ceramics and slag: is the slag over-fired ceramics or clay, or a completely different material? Is the local soil ("clay") the raw material for the ceramics?

Variation diagrams among several major element oxides and SiO_2, on a LOI-free basis, show a wide range of SiO_2 for the whole data set, from 60–82 wt%, suggesting a continuous transition from ceramics (60–77 wt%) over slag (71–76 wt%) to clays (74–82 wt%). The increasing SiO_2 is combined with a continuous decrease of Al_2O_3 and Fe_2O_3, and some increase of Na_2O. On the first sight this would suggest a genetic relationship among clay, slag and ceramics. The similarity of REE and some spider diagrams point in the same direction.

However, the distribution of other major and trace elements shows clear differences. For example, TiO_2 displays a weak negative correlation with increasing SiO_2 for ceramics and slag but significant higher contents for clays. Equally, trace elements such as Zr, Hf and Yb are substantially higher in the clay group compared with the others. The SiO_2 content of the slag on the other hand is lower than in the clays and in the same range as in the ceramics. The MgO is slightly higher at a given SiO_2, the K_2O and CaO increase significantly. Additionally, Zr and Hf are higher in slag than in ceramics. The clays finally are relatively low in SiO_2 but rich in Al_2O_3 and Fe_2O_3. MgO, K_2O and CaO are relatively depleted compared to the slag. On the other hand, the ceramics are enriched in transition elements such as V and Sc, relative to slag and clays. In terms of mineralogy, the difference between ceramics and slag can be explained by a higher content of Ca-rich and K-rich feldspars in the latter, while the former are dominated by illitic clay. Chemically, this difference is expressed by higher K_2O/Al_2O_3 ratios and CaO/Al_2O_3 ratios in the slag, compared with the ceramics.

Despite some undisputable similarities in the chemistry of all three groups, the compositional difference excludes a genetic relation among them. For example, mixing of the clays with the raw material of ceramics and slag is not feasible. Also the source material of ceramics and slag is significantly different ad characterized by an increase of feldspar content in the slag raw material. Summarizing, the clay found at the site was neither used for manufacturing the ceramics nor for the items which became later on slag. Both were manufactured from different materials, most likely at some other places but in the same area.

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