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New Discoveries at Rudna Glava — the earliest shaft-and-gallery copper mine in Eastern Europe

IAMS had planned to publish a monograph on the prehistoric mine workings of Rudna Glava, which are of major importance for the history of mineworking, in 1985. However, during the excavation in 1984 a new type of mine workings was discovered which made a re-assessment necessary. The final report, now scheduled for 1987, will include a full description of these earliest, incipient shaft-and-gallery mining systems, known only so far at Rudna Glava. We publish here a first communication from Professor Borislav Jovanović, the excavator, on his discoveries.

Rudna Glava is a now abandoned magnetite (iron ore) open cast mine in north-east Serbia (Yugoslavia) with early prehistoric workings partly preserved in the banks of the open cast. The first indications of the existence of any early eneolithic (Chalcolithic) mining activities at Rudna Glava were found in the provincial anthropological museum at Negotin. Here, a small votive altar decorated with deer-heads, typical of the early eneolithic Vinča culture, was published with the details: 'originated from an old mine shaft at Rudna Glava, 12m. below the surface'. This most unusual find triggered off a series of excavations undertaken since 1968 by the Mining Museum of Bor and the Archaeological Institute of Belgrade University. The result was the discovery of numerous eneolithic (Chalcolithic) mine 'shafts'.

The actual 'shafts' consisted of more or less vertical, trench-like or tubular oval veins (1.2-1.5m. in diameter, 16-20m. deep) of rich copper carbonates, mainly malachite and azurite, very similar to the chalcolithic copper mines at Chinflon, Huelva, Spain, excavated by an IAMS team led by Beno Rothenberg (IAMS Newsletter No. 2, 1981). These were not, however, shafts sunk into the rock in order to reach the ore veins below (as with later mines), but natural veins that had been followed and emptied by the prehistoric miners.

In order to reach the mineralized rock, the ancient miners had, in many instances, to clear a thick layer of surface soil, resulting in funnel-shaped shafts occurring above the actual mine workings. In these instances, platforms had been prepared to facilitate haulage from the underground workings.

More than 200 grooved mining picks, made of large, hard, river-borne pebbles were found in the workings. These belong to the earliest type of mining tools known to date and can be paralleled at Chinflon, Huelva; Timna, Israel, and Mt Gabriel in Ireland, etc. A number of antlers used as picks were also recovered from the shafts, these were a widely used implement in prehistoric flint mines.

Of particular importance for the history of mining and a major key for dating the Rudna Glava mines were the groups of pottery and votive altars found *in situ* in special storage areas in the underground workings. The votive altars were

previously known from agricultural settlements of the later Vinča culture and noted for their unusual deers-head decoration. Here at Rudna Glava, apparently, they served not only as cult objects but also as mining lamps, the earliest examples known.

In sharp contrast to the many different pottery types known from the Vinča culture, those found inside the mine consisted mainly of amphorae and simple pots, essentially undecorated utility ware appropriate for use in the workings. The pottery, backed by C14 dates, places the mines at the end of the Neolithic to early Eneolithic of the Central Balkans, producing a calibrated date of 4200-4000 B.C.

General view of the top of Mine Shaft 2N at Rudna Glava





Grooved pebble mining hammers from Mine Shaft 4A at Rudna Glava. Largest approx. 15 × 24 × 9.5cm

Small pottery votive altar with deer's head, found in the shaft of Mine 2G, 2H. Ht 20cm



Pottery amphora with lug handles from Mine Shaft 6A at Rudna Glava. Ht 43.5cm

The excavators considered vertical trench-mining as the highest technological level reached in this earliest mining phase. As far as the date is concerned, the late Vinča phase must be considered as the earliest possible beginning for copper mining. It is the earliest post-neolithic period and copper mining must obviously lie on the threshold of eneolithic (Chalcolithic) times. In 1984, however, new discoveries made it necessary to revise some of our thinking regarding this earliest metal mining phase. Horizontal 'galleries' were found deep in some of the shafts. These horizontal workings followed rich copper impregnation in the soft rock conglomerate, so far 3.5m. long and 80cm. wide. Presumably we are dealing here with an incipient shaft-and-gallery technology, the earliest of its kind found to date.

At the meeting point of the 'shaft-and-gallery', groups of pottery and grooved mining picks were found *in situ*. Amongst the pottery recovered were some finer quality, well-fired ceramic types, some having beautiful spiral decorations; similar sherds also occurred in the shafts and galleries — all being of the same early Vinča culture phase.

Although the Vinča miners, with their primitive stone picks, followed the natural veins of rich minerals and did not actually cut shafts and galleries into the rock as such, Rudna Glava must now be considered to be the prototype of incipient underground shaft-and-gallery mining.

Borislav Jovanović, October 1985

Editorial

With this issue we introduce a new Editor and a slight variation in our page size to achieve more economic printing costs. We intend to feature more original articles and reports and also for them to carry the signatures of their distinguished authors. In an endeavour to keep our subscribers abreast of not only our own IAMS work we shall feature news items and articles on work under other direction that throws light on early metallurgy anywhere in the world. From time to time we hope to also include reviews of books of interest. This, together with our new feature, 'News from the director's desk', will go a long way to keeping our readers up to date with developments in metallurgical studies.

P.A.C.