CHALLENGES AND METHODS OF RESCUE EXCAVATION AT **LOWER CEROVAČKA** CAVE: CASE STUDY OF THE BRONZE AGE STORAGE OF VALUABLE GOODS

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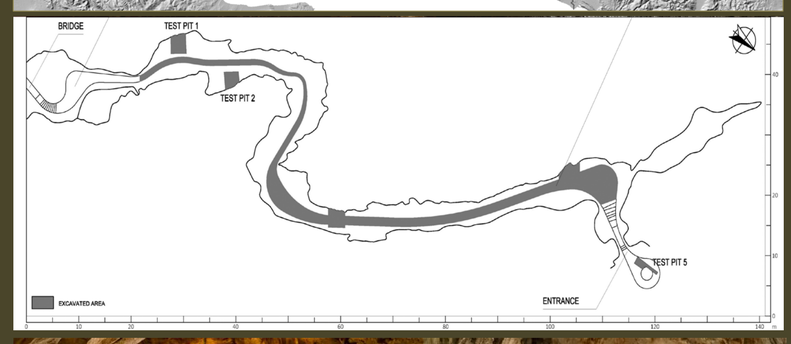
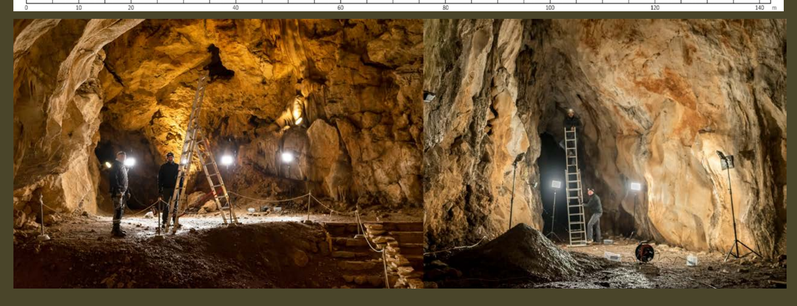
Introduction

The Cerovačke caves are located on the southeastern part of Mt. Velebit, on the steep northern slopes of the massif of Crnopac (elevation 550m). They are represented by three sub-horizontal cave channels, namely the Lower, Middle and Upper Cerovačka Cave. The Lower Cave was discovered in 1913 and since then the caves have been a focus for speleologists and other geoscientists. The first archaeological excavations in the Lower Cave were conducted in 1966 and 1967 (Drechsler-Bižić 1970; 1983; 1984). They recovered fragments of ceramic vessels and a few metal artefacts attributed to the Late Bronze Age.

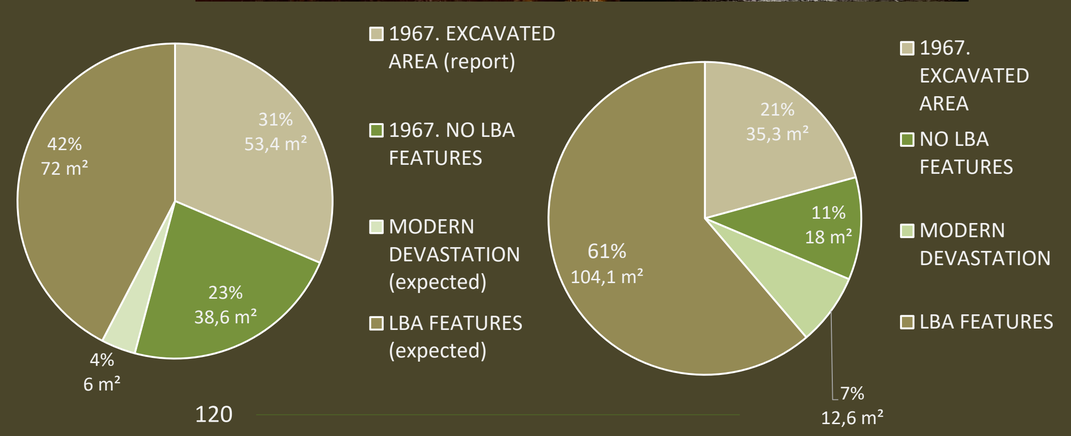
Rescue archaeological excavations of Lower Cerovačka cave were conducted in 2019 and represent a challenging and relatively rare type of intervention in the archaeology of Croatia. This extensive archaeological excavation covers an area of 210 square meters along the route of a new pathway, spanning 120 meters from the entrance, along the axis of the main cave channel. As this section of the cave area has an average width of only 4 m, the excavation covered a significant part of the cave channel. The fieldwork strategy was conditioned by various factors; therefore, adaptation and preparation were key to fulfilling the research objectives. The aim was to record the stratification sequence and to identify intact bronze age features in order to understand the processes of site formation.





Fieldwork strategy

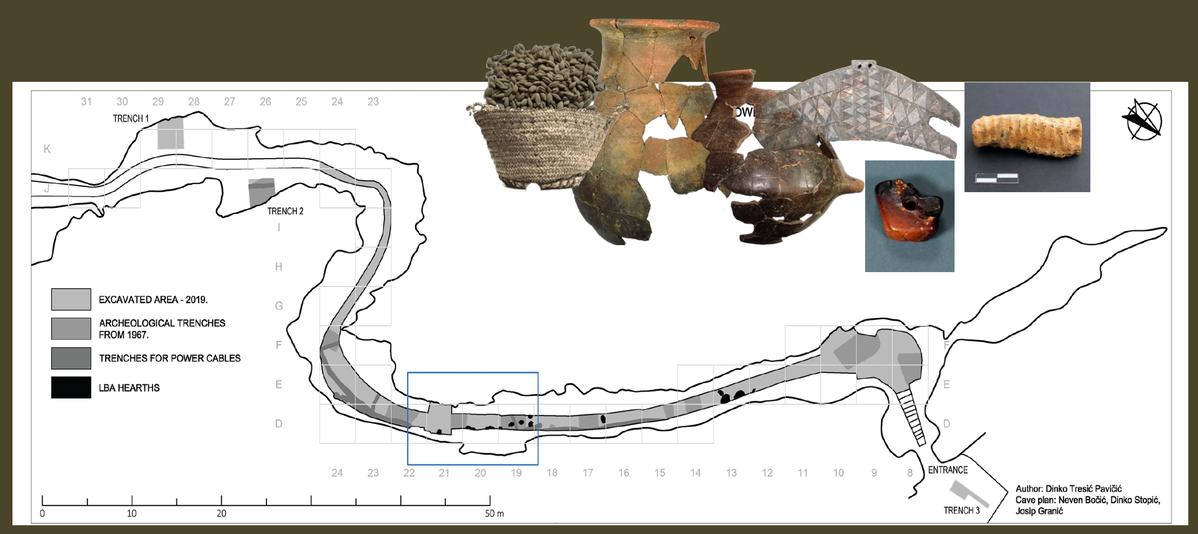
CHARACTERISTICS OF THE SITE	CONDITIONS AND DIFFICULTIES	ADJUSTMENTS
narrow and elongated cave canal	limited area for deposition of excavated material, communication and manipulation of the equipment	excavation method by quadrants 4x4 m
excavation conducted in 1966 and 1967 (12 probes measuring 4 x 4 meters and 5 test probes 1 x 1 meter were investigated)	the pathway is covered with pebbles, so the positions of earlier probes, which were only partially documented, are not visible any more	reconstruction of the position of the old probes
small thickness of archaeological deposits	difficulties with precise elevation measurements of stratigraphic units	digital photogrammetry
cave without natural light due to the narrow entrance area	inadequate existing lighting for excavation and recording of features	6 LED reflectors (5200 Kelvins) on stands, fixed wide lens for low light conditions f/1.4 external, flashlight
adverse micro-climate	temperature: 6-8 C° humidity: 90% constant draft (2,4 - 3,7 m/s)	
site under Environmental Protection Act	probability of negative impact on geomorphology, micro-climate and fauna of the cave	small excavation team – 2 teams of max. 4 people



Results

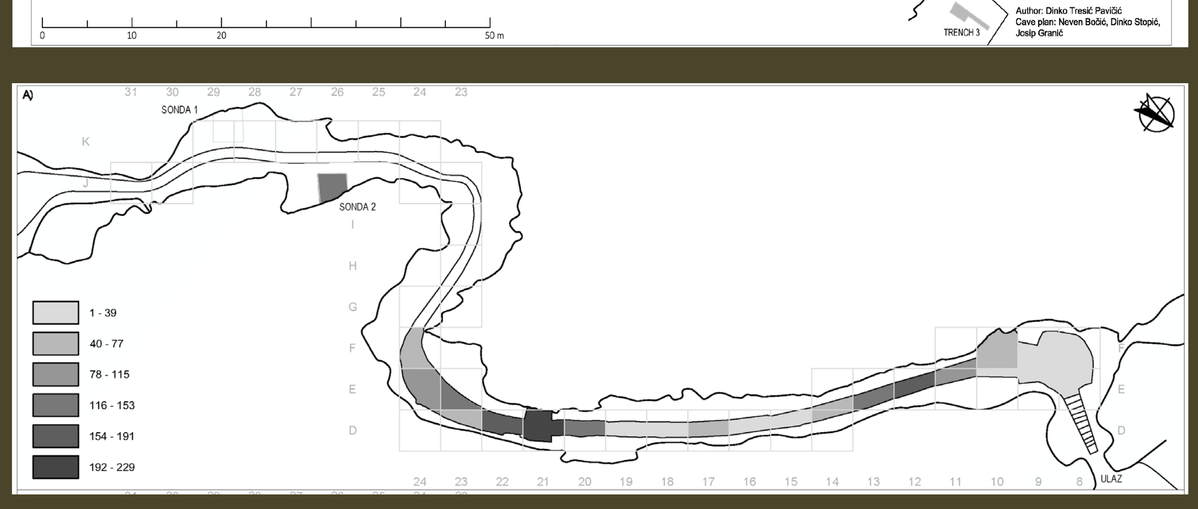
- The thickness of the archaeological deposits in average was only 10 cm so digital photogrammetry proved to be a fast, effective and precise recording technique, representing an appropriate documentation method.
- Stratigraphically three phases were identified: the cave geological sediments (1), Late Bronze Age (LBA, 2) and Modern era (3). However, mobile finds from the Early Bronze Age and the Middle Ages were sporadically recorded in the cave.
- It is assumed that the cave was used intensively, for a relatively short period, which did not allow the formation of thicker layers of archaeological deposits.
- The largest part of the finds belongs to two phases (early and late) of Late Bronze Age deposits that did not exceed 10 cm.
- According to C14 dates during the LBA the cave was used between the end of the 14th and the beginning of the 10th century BC.
- Archaeological records: fireplaces, holes from the columns of the above-ground construction.

- Mobile finds: 93,290 fragments of pottery weighing 3.5 tons, 239 bronze and 16 bone objects (costume parts, jewellery and utilitarian objects), 19 complete amber beads, carbonized plant remains with a volume of about 50 litres.
- Spatial analyses of movable finds are enabled.
- The analysis was carried out on the basis of the spatial and stratigraphic position of movable finds, mostly complete and those for which a certain function could be assumed. Distribution of certain groups of objects can suggest the interpretation of the site and answer the question of how the cave was used during the Bronze Age.
- The results suggest that at least in the last phase of the LBA, the cave was used as a storehouse for valuable goods.
- The spatial distribution of the original archaeological evidence in the cave was only partially disturbed by earlier research and modern interventions.



Conclusion

Even though the archaeological features are partly destroyed due to recent electricity installations and past archaeological and geological excavations, the applied excavation method revealed intact deposits throughout the entire excavated area, changing the previous knowledge about the cave use. The strategy of analytical processing of the artefacts had to reconcile the impact of pathway usage affecting vertical and horizontal displacements of a significant amount of Bronze Age movable finds. Therefore, the post-excavation method proved essential for a more detailed understanding of the use of the cave, including pottery refitting (3.5 tons) and the distribution analysis of other valuable artefacts in relation to the distribution of primary context features (hearths).



Mass distribution of fragments of ceramic vessels in relation to the volume of excavated sediment per quadrant

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