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THE ISTÁLLÓSKŐ CAVE EXCAVATION IN 2020 AND ITS RESEARCH OBJECTIVES

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Istállós-kői-barlang (Istállóskő Cave) is one of the most famous prehistoric sites in the Bükk Mountains of Northeast Hungary. This cave is the most visited archaeological site for tourists in Hungary, due to its location in the valley of Szalajka Stream, a high-tourism area of the Bükk Nature Reserve. The site can be visited freely but is protected by nature conservation laws. The importance of Istállóskő Cave is based on the fact that it is one of the oldest shelters used by the first anatomically modern humans in Europe. Field research that obtained a variety of samples for interdisciplinary studies was carried out decades ago, but the methods for investigating Palaeolithic sites have become more refined since that time. This inspired us to conduct a renewed excavation at the site to understand the ecological aspects of the first anatomically modern humans in Central Europe better.

Fig. 1. Istállóskő Cave entrance (July 2019)

Keywords: cave excavation, Upper Palaeolithic, Aurignacian, Bükk Mountains

ISTÁLLÓSKŐ ARCHAEOLOGICAL RESEARCH HISTORY

The first excavation here dates back to 1911 (or possibly 1912, as the documents do not make the year absolutely clear) and was performed by Jenő Hillebrand (Vörös 2003–2004). Hillebrand (1913) described a simple succession of layers that was severely affected by late prehistoric human activities. Where the layers remained undisturbed, Hillebrand discovered extensive combustion features 0.4–0.8 m below the level of the cave floor at the time of the excavation. One of these hearths, which was up to 40 m^2, included three slabs of limestone (Hillebrand 1914; 1917; 1919; Kadić 1927). Due to the lack of contemporary documents, the exact spatial location of this hearth layer was unknown. The hearth layer was located under a succession of one Holocene and then two Pleistocene layers. A reddish yellow layer followed below the hearth.

Andor Saád (1929) excavated the rear part of the cave in 1927 and observed a stratigraphy consisting of units undescribed by former excavations:

- a recent top layer,
- gray clay with debris,
- yellow clay,

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- grayish-yellow clay with debris,
- hearth layer (upper),
- reddish-yellow clay,
- hearth layer (lower),
- yellow clay with debris.

Archaeological finds were connected to the two hearth layers. The upper hearth layer yielded a "Gravettian blade" and the lower hearth contained two osseous artifacts, one of which was the first Aurignacian split-based point found at the site.

Ottokár Kadić and Mária Mottl (1944) conducted excavations in 1929 and 1938, respectively. No finds were reported from these two field seasons, although both hearth layers observed by Saád in 1927 were exposed again. Since the density of archaeological finds was low, they considered the site financially unworthy for further investigations.

Hillebrand (1917; 1919) compared the lithic artifacts of the hearth layer to the Western European Upper Aurignacian based on burin typology and the lack of carinated end-scrapers. Kadić and Mottl (1944) found the lithic tools of Istállóskő similar to those of Moravany in Western Slovakia, and thus they attributed the finds to the late phase of the Upper Aurignacian. These French archaeological cultural classes of the early 20th century today can be correlated with the Gravettian Middle Upper Palaeolithic culture.

Studies on the archaeological finds retrieved prior to 1947 sometimes face difficulties because of the lack of excavation documents. Kadić and Mottl (1944) published plans and stratigraphic sections of the former excavations that László Vértes (1955) used to compile the excavation history of the site (*Fig. 2*). Indeed, of all the excavations, the archaeological material unearthed by Vértes between 1947 and 1951 can be best correlated with the site stratigraphy.

The chronology of the human occupations at the cave has long been based upon the results of Vértes (1955). The first excavation by Vértes (1957) in 1947 was aimed at finding the extensive hearth described by Hillebrand. Vértes found a hearth in 1947 in the middle section of the cave, which was circularly aligned with slabs of limestone. At the end of this fieldwork, the hearth was removed from the site and then set up at the archaeological exhibition of the Hungarian National Museum (Vértes 1951). In 1948, Vértes opened a 12 m long trench with slanting walls in the middle longitudinal line of the cave stretching between the entrance and the middle section of the cave, and this was excavated down to the bedrock (Vértes 1951). In 1950 and 1951, the front part of the cave to the left and right of the trench was also excavated down to the bedrock. An area of ca. 160 m^2 was finally excavated through stratigraphy that was 2.5 m deep on average, removing ca. 400 m^3 of sediment (Vértes 1955).

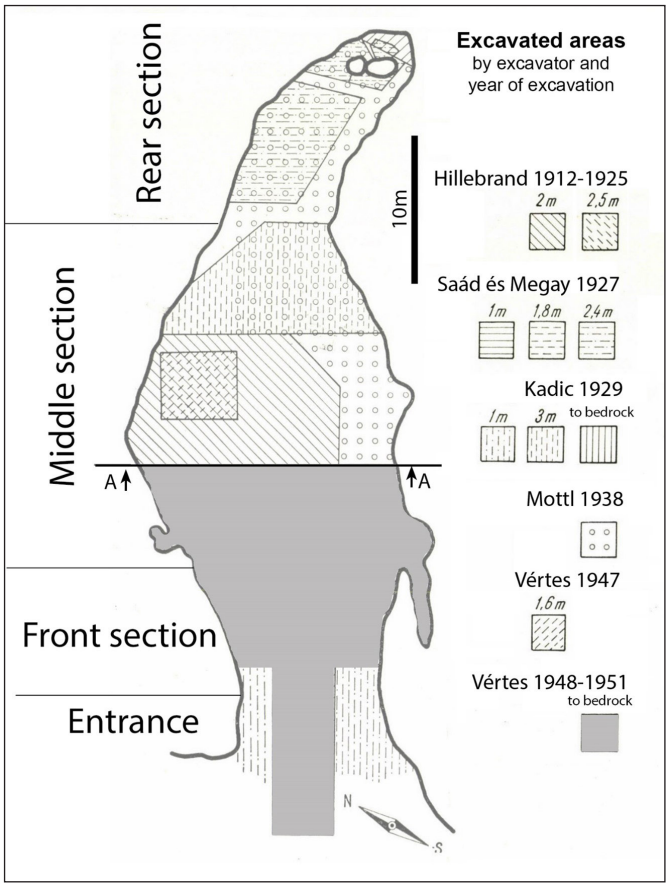

Fig. 2. Istállóskő Cave site plan marking the areas excavated before 2000 (modified from Vértes 1955, Abb. 1)

The results of the excavations in 1950–1951 refuted an association between the human occupations and the Gravettian culture, and classified the archaeological finds into a twofold division of the Aurignacian in terms of the contemporary French chronology: Aurignacian I and Aurignacian II. The Aurignacian I (lower cultural layer) was characterized by split-base bone/antler points made in a wide

range of sizes from arrowheads to spearheads, and the Aurignacian II (upper cultural layer) yielded Mladeč/Olschewian type large osseous spear points. The lithic toolkits of both Aurignacian occupations did not include diagnostic types. Vértes claimed that all the finds retrieved before 1947 could be related only to the Aurignacian II upper cultural layer (Vértes 1955).

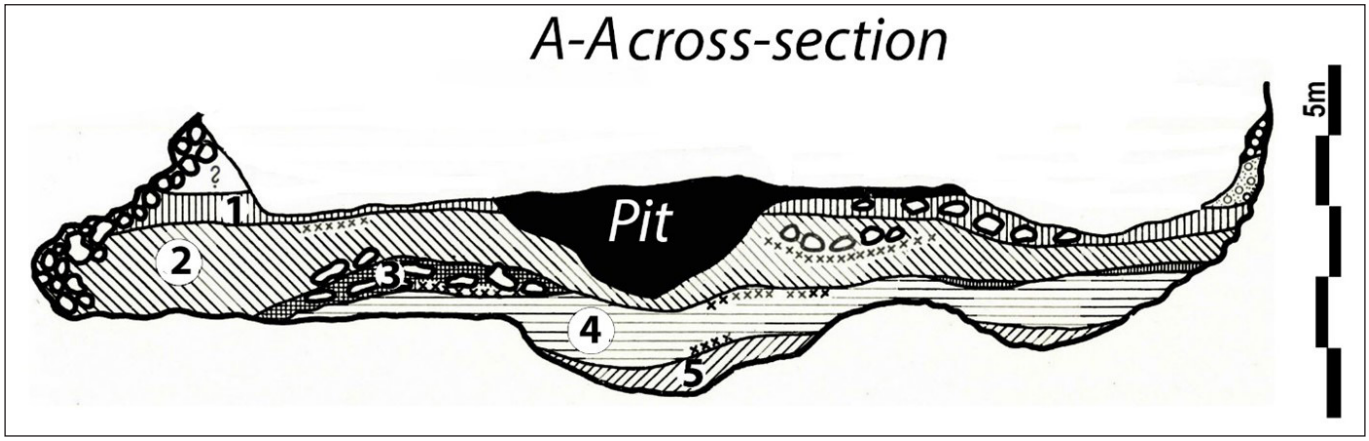

Fig. 3. The stratigraphic cross-section of the excavation in 1951 (modified from Vértes 1955, Abb. 3b). The location of this cross-section is marked A-A on Fig. 2

Vértes (1955) eventually described five Pleistocene layers (*Fig. 3*):
1) yellowish brown loess sediment with little debris;
2) dark brown sediment with debris (the upper level of this layer includes the Aurignacian II);
3) purplish grey and red sediment appearing locally in the stratigraphy (Aurignacian I);
4) pale brown sediment with small debris (Aurignacian I);
5) disintegrated bedrock.

Vértes conducted laboratory investigations utilizing the natural sciences on the sediments, the results of which showed the layers were formed under various climatic conditions (Vértes 1959). However, these results most likely can be considered inaccurate today due the difference between the excavation methods of the early 1950s and the current sampling standards. Similarly, the simplified stratigraphic divisions and the difficult correlations between layers and artifacts excavated prior to the 1950s allows for divergent archaeological conclusions. The latest reviews of the finds have either supported the Aurignacian cultural affiliation (Patou-Mathis *et al.* 2016) or denied this (Markó 2015; 2017). In relation to the lower cultural layer (Aurignacian I), Markó (2015; 2017) claimed similarities with the late Middle Palaeolithic sites of the Jankovich Cave, Bivak Cave, and Vindija Cave. He classified the upper cultural layer (Aurignacian II) and the finds unearthed before 1947 as Gravettian similar to those found at Bodrogkeresztúr–Henye and the uppermost layer of Szeleta Cave in northeast Hungary as well as the Bárca II Aurignacian find in eastern Slovakia.

European Palaeolithic research still regards Istállóskő as an Aurignacian site (Chu 2018) with important evidence for the Danube corridor hypothesis in the investigation of the dispersal of anatomically modern humans in Europe (Conard & Bolus 2003). Indeed, Istállóskő is the only cave site in eastern Central Europe where two Aurignacian occupation sites are available to be excavated, including one of the earliest appearances of modern humans. Radiocarbon dates attest to an age of 40 ky cal BP for the lower cultural layer, and 34 ky cal BP for the upper cultural layer (Adams 2002; Ringer 2002; Davies & Hedges 2008–2009). These dating results and the available scenarios that provide divergent interpretations for the cultural affiliations of the artifacts inspired the need to conduct fieldwork employing current archaeological methodology.

EXCAVATION IN 2020

The international importance of the find assemblages of Istállóskő demanded a detailed archaeological investigation using the natural sciences. Therefore, we undertook a field season in August and September

2020 as part of a three-year project of the Polish Academy of Sciences in association with the University of Miskolc and the Eötvös Loránd University, financed by National Science Center of Poland.

The location of the former excavation trenches (Vörös 2003–2004) suggested that the original sediments in an area 3 m wide and 15 m long perpendicular to the cave axis in the middle section could be found between the hearth removed in 1947 and the final stratigraphic profile of the 1951 excavation. This portion of the cave strata preserved the entire stratigraphy of Vértes's excavation. At other locations, the sediments were likely to have been entirely or mostly missing, possibly preserving only the lower portion of the original strata. As the cave is in a nature reserve, the excavation was designed to remove as little of the original sediments as possible while providing a sufficient number of samples necessary for the research objectives.

Fig. 4. The stone wall protecting the stratigraphic cross-section of Fig. 3, built in 1951 by László Vértes (Vértes 1957, Fig. 33)

Fig. 5. The remains of the stone wall from 1951 (view from the entrance)

Accessing the stratigraphic section of Vértes' excavation in 1951 should have been simple because a massive stone wall had been constructed to protect it (*Fig. 4*). First, we exposed a 3 m wide section of the wall (*Fig. 5*), which was enlarged to 4.5 m by the end of the excavation (*Fig. 6*).

The stone wall built by Vértes in 1951 preserved only the lower third located at the bottom of the current sloping cave floor. The surface of the slope truncated the original stratigraphy diagonally. Accordingly, several cubic meters of original sediments may have eroded down to the bottom of the first section of the cave, which was excavated down to the bedrock.

We opened an area of 8 m^2 above the original sediments. The scar in the intact stratigraphy from the hearth that had been removed in 1947 was clearly visible in the northern section (*Fig. 7*). The removal of the hearth seems to have caused major damage to the original site stratigraphy.

The intact original strata located in an area ca. 3 m wide between the 1947 hearth and the 1951 stratigraphic profile were excavated in 2020 to their entire depth (*Fig. 8*). The stratigraphic section was not

Fig. 6. The excavation in 2020.

Fig. 7. The border between the original intact stratigraphy (yellow hued sediment on the left) and the backfill of the hearth removed in 1947 (grayish sediment to the right)

excavated in one vertical wall but in steps in correspondence with the excavation grid. This left the original sediments intact as much as possible. Bedrock was hit in one square of the grid after removing sediment that was 75 cm thick. We used 2 cm spits to remove the sediment within geological layers. Each find was recorded with three coordinates using a total station and the sediment was sieved. In total, we explored 3 m of strata by removing 2.5 cubic meters of sediment. This method left most of the original strata undisturbed to be investigated in the future.

The layers of the 1951 section were clearly identifiable in the section excavated in 2020. However, the stratigraphy turned out to be more complex than what was recorded by Vértes (1955). Vértes removed ca. 50 cm from the bedrock probably due to the fact that the top of the bedrock easily disintegrated into small laminae. Instead of the four layers found in 1951, we recognized 11 layers (*Table 1*).

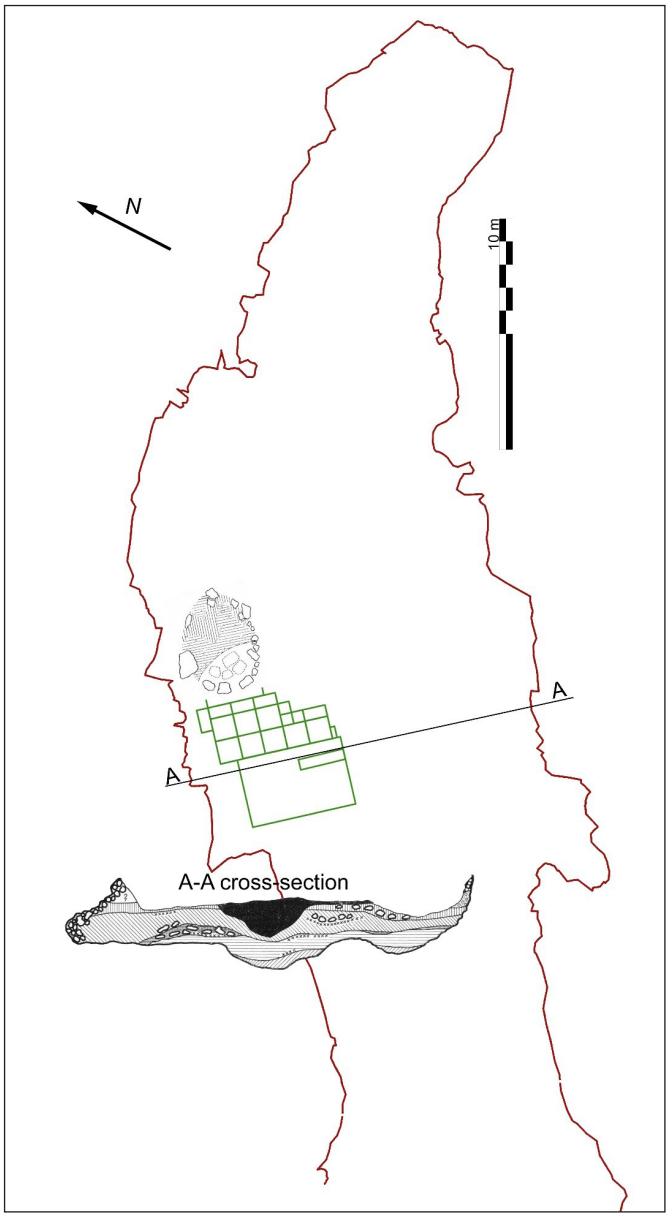

Fig. 8. Site plan of the cave in 2020 and the location of the trench (green lines) between the hearth removed in 1947 and the stratigraphic cross-section of 1951 (A-A)

Table 1. Correlation between the layers of the 1951 and 2020 excavations.

layers of 1951	layers of 2020
1	1: yellow with small debris, 30 cm (*Fig. 9*)
1	2: brown with small debris, 10 cm (*Fig. 9*)
1	3: yellow with small debris, 20 cm (*Fig. 9*)
2	4: pale brown with a purple hue locally and with large debris, 30 cm (*Fig. 9*)
2	5: yellow with large debris, 20 cm (*Figs. 9–10*)
2	6: purple with medium debris, 30 cm (*Fig. 10*)
2	7: gray–dark gray with medium debris, 15 cm (*Fig. 10*)
2	8: yellowish brown with large debris, 10 cm (*Figs. 10–11*)
3	9: purple with large debris, 50 cm (*Figs. 10–11*)
4	10: yellowish brown with small debris, 80 cm (*Figs. 10–11*)
4	11: dark brown with small debris, 20 cm (*Fig. 11*)

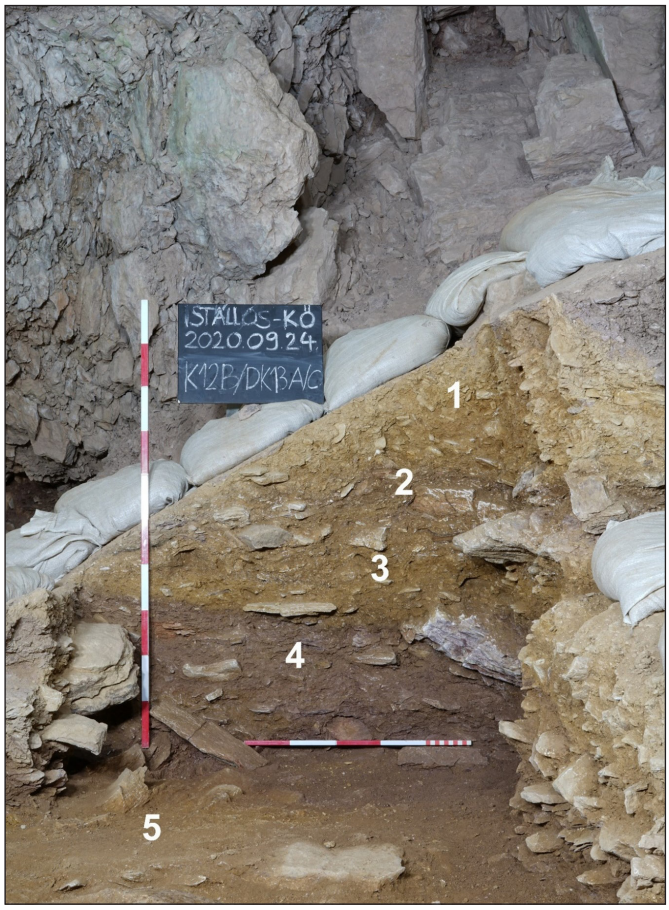

Fig. 9. The upper segment of the stratigraphy in 2020

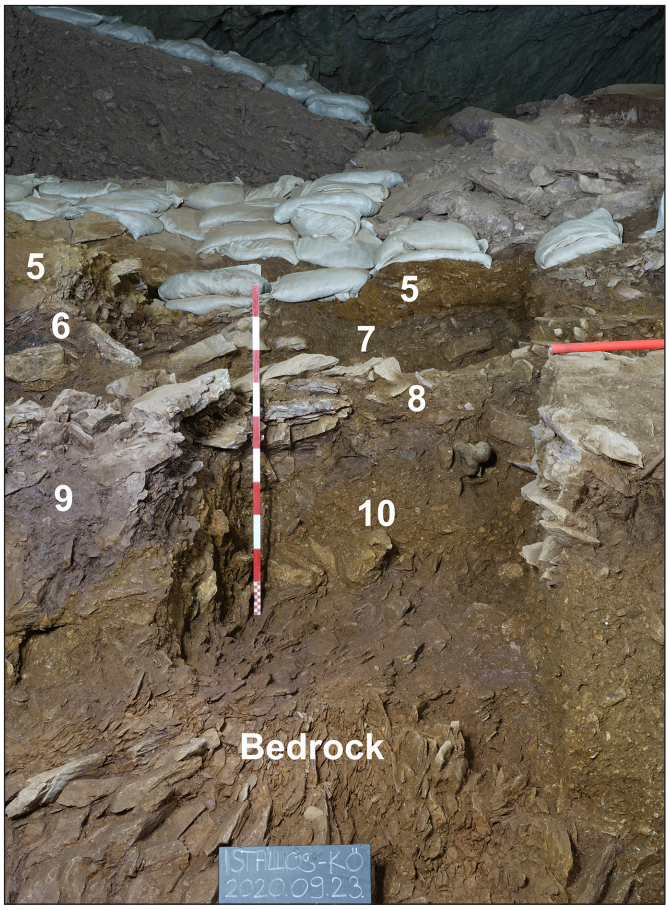

Fig. 10. The middle segment of the stratigraphy in 2020

The following studies are planned to achieve the research objectives:
– sediment micromorphology, grain size, and geochemistry;
– palynology;
– anthracology;
– archaeozoology;
– biochemistry ($^{18}O/^{16}O$, $^{15}N/^{14}N$, $^{13}C/^{12}C$, $^{87}Sr/^{86}Sr$);
– radiocarbon dating.

Almost all of the archaeological finds are osseous animal remains. Most of them are from cave bears, with other species including hare, fox, wolf, and deer. The archaeozoological study is still in progress, thus precise numbers cannot be provided here.

Several combustion features marked by the concentration of charcoal materials of differing sizes were also found. These occurred mostly in layers 5 and 7, correlating with Vértes's Aurignacian II period. However, scattered pieces of charcoal were found in every layer.

Only one specimen of knapped stone was found: an uncharacteristic piece. Such a scarcity of artefacts was expected, since Vértes found ca. 300 artefacts from over 400 cubic meters of sediment. Fragments of osseous artefacts may still be discovered among the animal remains during archeozoological analysis.

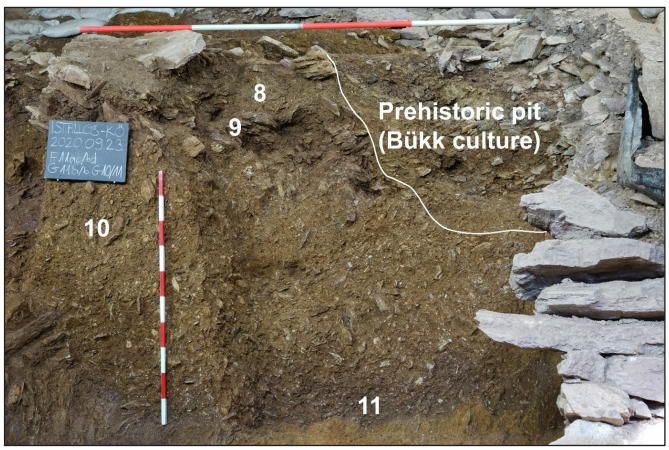

Fig. 11. The lower segment of the stratigraphy in 2020

The completion of the research is expected to refine the chronology and the ecology of the first modern humans in the Western Carpathians. The results will be expected in the course of 2022 and their publication will occur in 2023.

ACKNOWLEDGMENTS

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