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A COMPARISON OF EARLY IRON AGE LANDSCAPES BETWEEN THE ALPS AND THE DANUBE

First results of a joint Hungarian–Slovenian project

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The paper introduces a joint Hungarian-Slovenian comparative landscape archaeological research project focusing on the changes observed during the Early Iron Age (EIA) in two microregions: around Süttő (Hungary) and Poštela (Slovenia). The archaeological data collected from hilltop settlements, burial mounds, flat cemeteries, and the surrounding areas in the two microregions are interpreted by also involving various paleoenvironmental information originating, on the one hand, from the investigated site complexes and, on the other hand, from the analysis of a sediment core at Lake Balaton.

Keywords: Süttő, Poštela, Early Iron Age, Hallstatt Period, landscape archaeology

INTRODUCTION

The EIA of the broader eastern Alpine region (8–5th century BC) is characterised by the emergence of archaeological complexes consisting of fortified hilltop settlements, barrow cemeteries, flat cemeteries and adjacent fields for various purposes (e.g., arable lands and grazing fields). It can be regarded as a fundamental and large-scale landscape transformation, which evokes significant interest from a landscape archaeological point of view.

Recently, in the framework of the EU-funded Iron Age Danube (IAD) Transnational project (2017–2019), large amounts of topographical data regarding EIA sites from Slovenia, Croatia, Austria, and Hungary were collected into a unified database (Czifra *et al*. 2020). Additionally, nine of the most impressive EIA site complexes of these countries (Dolenjske Toplice, Poštela, Jalžabet, Kaptol, Strettweg, Grossklein, Százhalombatta, Süttő, and Sopron) were investigated in more detail (Črešnar & Mele 2019*; see the project's* website). All these site complexes have a long research history, in the research of which, after decades of using merely traditional fieldwork strategies (primarily excavations), the adaptation of various landscape archaeological methods promises a new chapter.

In 2021, a research team of the Eötvös Loránd University (Hungary) and the University of Ljubljana (Slovenia) launched a joint three-year project entitled *Early Iron Age Land Use between the Alps and the Danube; comparative landscape archaeological analyses of Süttő and Poštela site-complexes*. Although the two target sites have different geographical backgrounds (eastern fringes of the Alps vs a loess plateau over the Danube with low mountains in the vicinity), they bear many similarities and offer important clues for understanding the formation processes of EIA (Hallstatt) cultural landscapes in Central Europe (*Fig. 1*). Furthermore, while in the previous project, the focus of research was on the archaeological prospection of EIA site complexes and the visualisation of the physical characteristics of the prehistoric landscape, the

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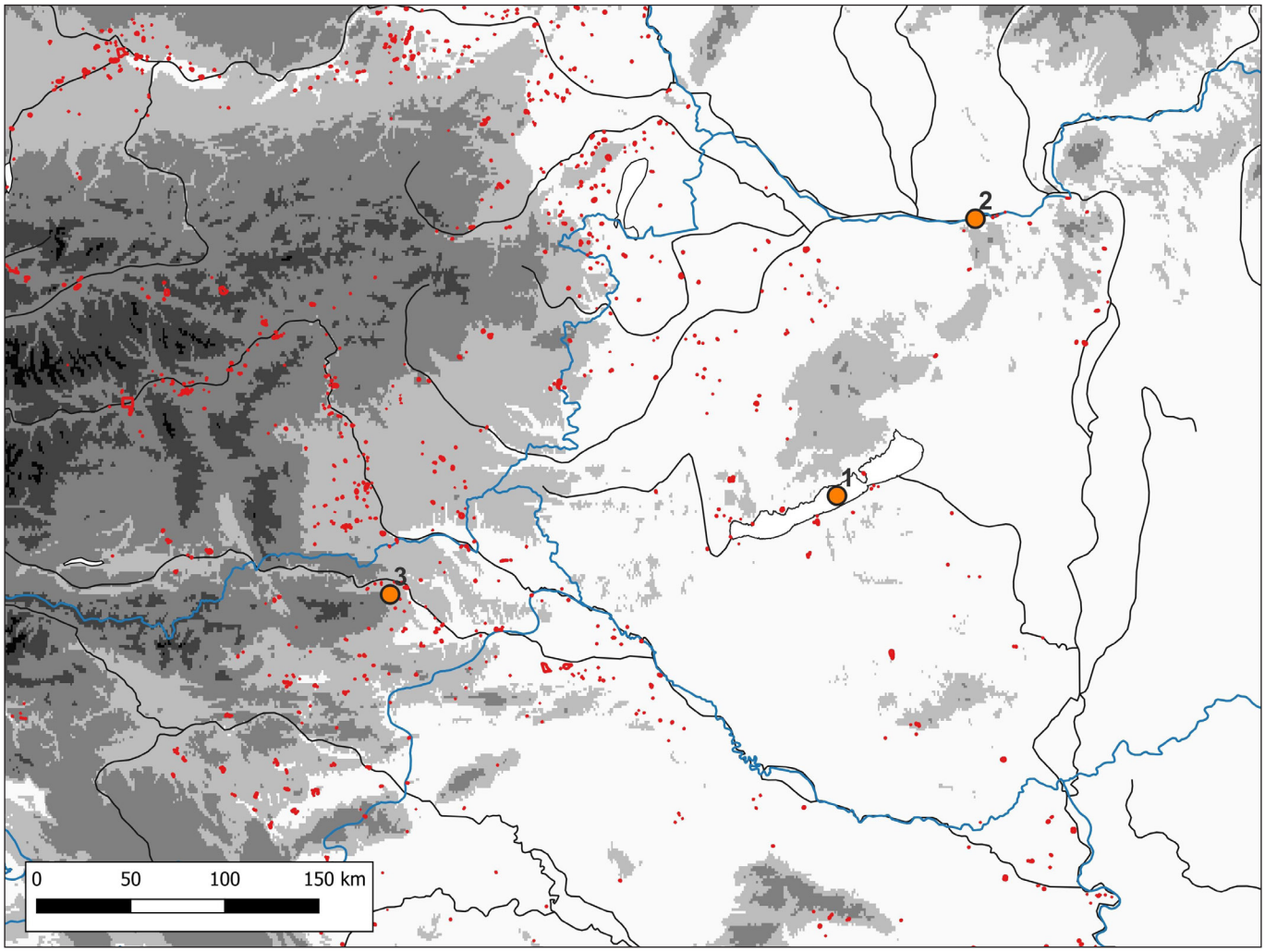

Fig. 1. The investigated site complexes, the position of the sediment cores in the Balatonszemes Subbasin, and EIA sites from the Iron Age Danube Database. 1: sediment sample Tó-34a, 2: Süttő, 3: Poštela (map by Bence Soós)

new project aims at reconstructing the prehistoric land cover as well. Paleoenvironment specialists, geophysicists, physicists, and pedologists are involved in investigating the land use in the two microregions and comparing regional environmental data to supra-regional tendencies (relevant for the entire Pannonian Basin) observed in sediment cores from Lake Balaton.

POŠTELA

The Poštela hillfort, with its extensive cemeteries, is located on the eastern fringes of the Pohorje Massif overlooking the plain of the Drava River *(Fig. 2)*. The site has been known since the mid-19th century, and several investigations campaigns took place in both the cemeteries and the hillfort since the late 19th century. The most important early researcher of the site was Walter Schmid from the Museum Joanneum in Graz, who led the first ever extensive systematic research of a prehistoric fortified settlement in the region at Poštela, excavating over a hundred trial trenches. In the late 20th century, Stanko Pahič excavated the first flat cremation graves on the Habakuk plateau just below the settlement. Later, Biba Teržan improved our knowledge about the hillfort and its surroundings significantly by publishing the results of her fieldwork and, especially, previously unpublished materials and data (Teržan 1990, 26–36, 59–78, 256–307; Strmčnik Gulič & Teržan 2004; Teržan & Črešnar 2021). Another trial trench was excavated over the rampart, yielding important information about its construction and phases and uncovering other details of the inner chronology of the settlement. The investigations also included excavations in the nearby flat cemetery and a burial mound. Three major chronological phases were determined for the EIA settlement

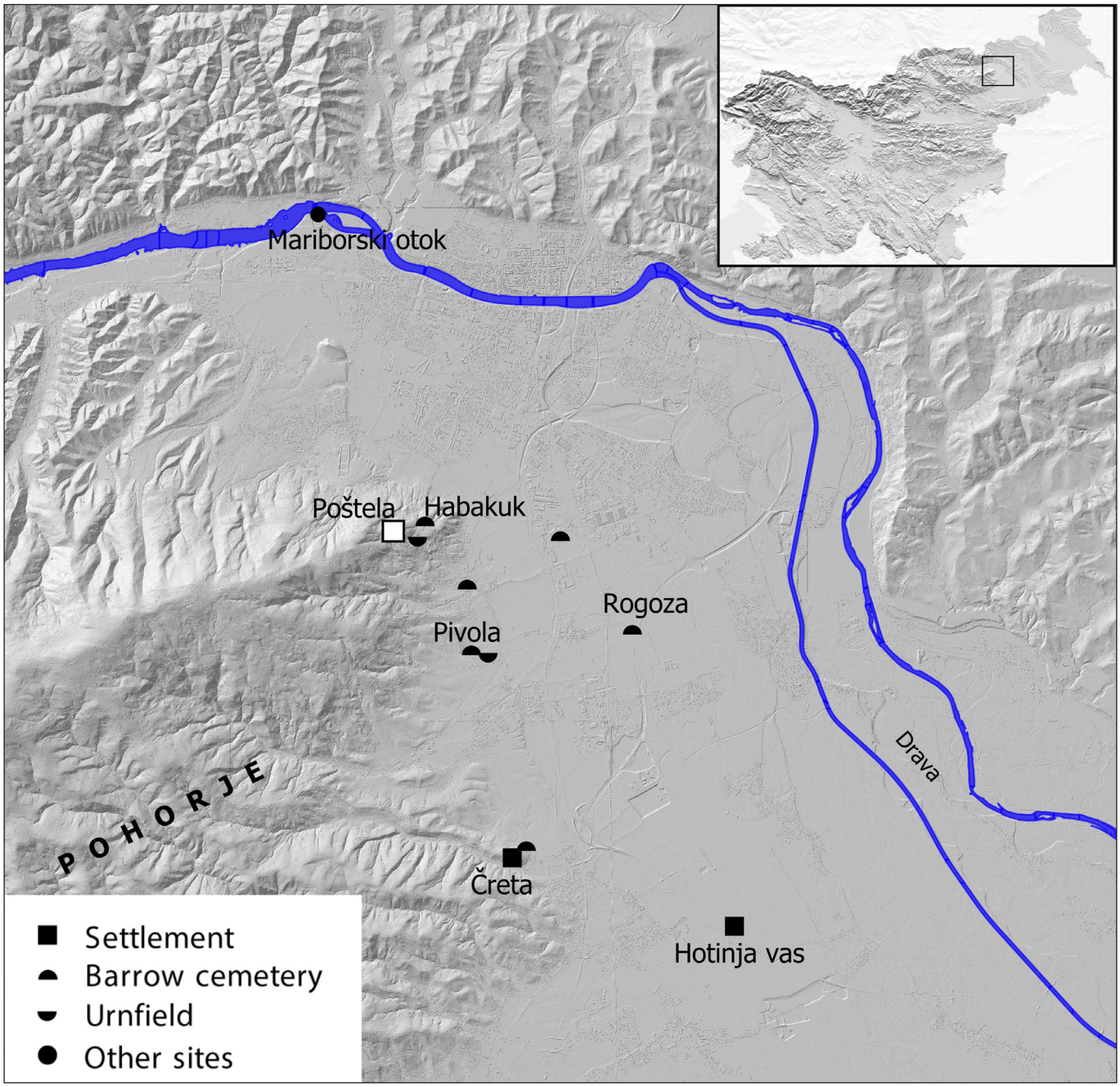

Fig. 2. Poštela. The EIA hillfort with its cemeteries and nearby contemporary sites (map by Nejc Dolinar)

horizon; these were partly synchronised with the burials. The occupation started in the Ha B3/C1, had an upswing during the Ha C, and continued throughout the Ha C/Ha D1 phase. Due to the limitations of the information gleaned by early research, it is not completely clear whether the fortified area was fully inhabited during all these phases (Teržan 1990, 26–36); however, the results of recent investigations have revealed areas without remains of EIA buildings (Črešnar, Vinazza & Mušič 2019).

The research carried out at the Poštela archaeological complex in the last decade shifted mainly to non-/low-invasive methods (ALS and geophysics; see Teržan, Črešnar & Mušič 2012; Črešnar & Mlekuž 2014; Mlekuž & Črešnar 2014; Mason & Mlekuž 2016; Črešnar 2017; Mušič, Črešnar & Medarić 2014; Medarić, Mušič & Črešnar 2016; and Mlekuž & Črešnar 2019). The focus of the intensive research was primarily the hillfort and the Habakuk plateau with groups of tumuli and a flat cemetery, parts of which have already been published (Teržan, Črešnar & Mušič 2015; Medarić, Mušič & Črešnar 2016; Mušič *et al.* 2015; Črešnar, Vinazza & Mušič 2019). However, Poštela is a multi-period site, and the microregion

around it is very rich in archaeological sites representing various historical periods from the Late Bronze Age (LBA) (Ha A and Ha B) to the Roman Period (2nd and 3rd centuries AD). The recent investigations discovered key elements of the puzzle and inserted them into the existing sketchy framework of the microregion's past; however, the picture is still far from being vivid. Researching the region with remote sensing methods also means detecting, mapping, and testing features from various historical periods predating and succeeding EIA.

SÜTTŐ

The site complex of Süttő is situated on top of a loss plateau, at an average altitude of 40 m above the Danube, and spreads over more than 80 hectares (*Fig. 3*). It is bordered by limestone hills from the south, next to an open, alluvial plain in the north, across the river. Significant excavations led by Éva Vadász and Gábor Vékony were carried out at all three known units of the EIA complex (i.e., the fortified settlement, the tumulus cemetery, and the flat cemetery) between 1978 and 1990, but only preliminary reports have been published (V. Vadász 1983; Vadász 1986; Vékony 1986; Vékony & Vadász 1982). The results of these previous research campaigns are currently being processed and evaluated by Katalin Novinszki-Groma (Novinszki-Groma 2017a; 2017b).

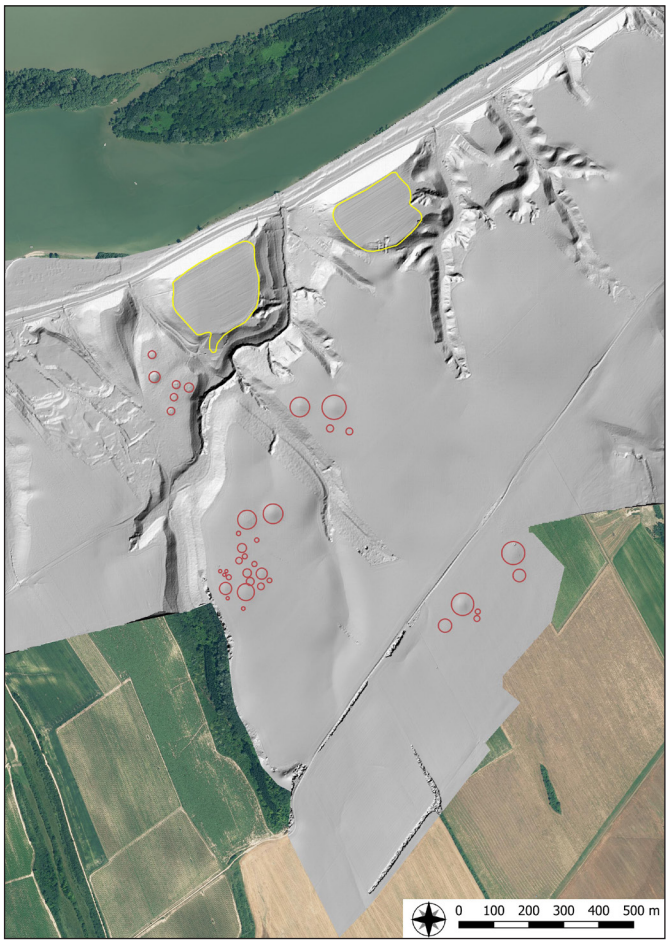

Fig. 3. EIA hilltop settlements and tumuli on the Süttő plateau. Results of the ALS (Géza Király), drone photogrammetry (László Rupnik) and magnetometer (Sándor Puszta) surveys (map by László Rupnik)

The detailed topographic investigation of the site complex re-started in 2013 with aerial photgraphy (Czajlik, Novinszki-Groma & Horváth 2015; Czajlik *et al*. 2017) and, thanks to these and some earlier research carried out in the area within the frame of the Hungarian Archaeological Topography project (Horváth, H. Kelemen & Torma 1979) many prehistoric sites have been identified in the Süttő microregion. Cooperation with the University of Nitra in the IAD project enabled us to integrate field data from the associated region in southern Slovakia into our inhabitation pattern model. Such an integrated approach may help to place Süttő in a wider cultural scheme. It has been suggested, for example, that the Süttő microregion and the adjacent areas north of the Danube had close contact with non-Hallstatt cultural groups during EIA (Romsauer 1993, 21; 1999, 173–174; Czifra *et al.* 2017, 271–272). The most important discovery of the latest archaeological fieldwork campaign at the Süttő plateau has been that the land use was intense in both the preceding (Early, Middle and LBA) and subsequent periods (Late Iron Age) (Czajlik *et al.* 2018; 2019a; 2019b).

THE FIRST RESULTS OF THE LANDSCAPE ARCHAEOLOGICAL RESEARCH

During the last research project involving geophysical and ALS surveys, we uncovered the traces of numerous barrows, possible ancient communication routes, and open lowland settlements. The recent investigations follow a complex landscape research methodology combining non-invasive and low-invasive site-diagnostic techniques and traditional data collection. It is paramount to identify the boundaries of the

Fig. 4. Magnetometer survey conducted by the researchers of the Eötvös Loránd University at the tumulus field around Poštela (Pivola, Botanical Garden of the University of Maribor) in October 2021 (photo by Zoltán Czajlik)

Fig. 5. ERT survey conducted by the team of the University of Ljubljana at the northeastern tumulus group of the Süttő plateau in September 2022 (photo by Zoltán Czajlik)

two main site complexes and more coeval sites in their vicinity. Aerial archaeological investigations have involved the processing of archive footage (for the results regarding Süttő, see (Czajlik 2022). Large-scale geophysical mapping was conducted by a team of ELTE, while the thorough investigation of the burial mounds' inner structure was a joint venture of the two institutions. The latter, involving intensive magnetic surveying, GPR and ERT, was led by Branko Mušič. Geomorphological mapping was carried out by Balázs Nagy, and paleopedological samples have been evaluated by Ákos Pető. Mária Hajnalová investigates the macrobotanical remains, while Botond Buró is engaged with preparing soil samples for radiocarbon dating and evaluating the results.

These methods have been supplemented by some from the traditional archaeological toolkit: the areas were explored by fieldwalking, and the material collected was processed and evaluated in the context of the already known archaeological record.

As the project considers it crucial to analyse the landscapes in their respective dynamic chronological contexts, the preceding and subsequent periods are also investigated and considered. In the case of the Süttő site complex, the research for the relics of preceding prehistoric periods shed new light on the characteristics of land utilisation and perception before EIA. It seems that the naturally well-protected and prominent location of the Nagysánctető area, where the EIA fortified settlement was erected, had a unique role in almost all periods, and it was reinforced several times already during the Bronze Age (Fejér 2022; Fejér & Tóth in prep.). The surrounding inner areas of the plateau, however, were used for different purposes at different times: while there was a large burial ground during EIA, only features related to everyday activities came to light from the preceding periods. The examined Bronze Age record testifies to intensive interaction between the Süttő plateau and the neighbouring region across the Danube (Fejér & Tóth *in prep.*), and some finds prove that the local population was involved in long-distance networks along the Danube already in the Bronze Age (for an LBA example, see Fejér 2021).

We could also gather information regarding the period after EIA. It suggests that the landscape in the Late Iron Age (e.g., the paths of routes) was formed and transformed with consideration to the visible remains (tumuli groups) of the Hallstatt Period (Czajlik *et al.* 2019a).

Also, the broader surroundings of Poštela, i.e., the Drava River plain, are important for understanding the transition between LBA and EIA. The settlement pattern in the whole region changed fundamentally: habitat preferences shifted from lowland to highland, and settlement fortification systems emerged, becoming a rule in EIA. During LBA, the lowland settlements, e.g., Rogoza, Orehova vas (both 12th–11th century BC), and Pobrežje (11th–9th century BC), relied mainly on agriculture, supplemented by other economic activities, including metalworking. During EIA, the Poštela hillfort seemingly acted as a regional centre, which might have had a "proto-urban" character with several smaller agricultural settlements in the lowland

coexisting as its satellites (e.g., Hotinja vas, 7th–6th century BC). Nevertheless, during the early phase of the gradually emerging EIA, the local Urnfield cultural tradition persisted in some form, as reflected mainly by the religious sphere manifesting in the continuity of distinct burial customs and rites, i.e., flat cremation graves. At the same time, one may also witness the emergence of new artefact types and *tumuli*, a new form of grave monuments, which also suggest a much more stratified society than in the preceding period (Teržan & Črešnar 2021, 561–581).

Although the already published data offers a firm ground for interpretation, new research is opening up even more avenues. The employment of LiDAR scanning, aerial photography, and large-scale geophysical prospection made us even more aware of the whole landscape around Poštela, which is still full of partly discovered and undiscovered traces. We continue with the intensive study of the flat urns and tumulus cemeteries and some selected individual monuments to gain a deeper understanding of also the ritual aspects and creation of ritual landscapes (e.g., Mlekuž & Črešnar 2014; Teržan, Črešnar & Mušič 2015; Črešnar, Vinazza & Mušič 2019).

The shared characteristics of the EIA site complexes at Süttő and Poštela can be summarised briefly: they occupy large territories divided into separate inhabitation or funerary units, were re-used and reinforced during the Iron Age, and witnessed major human land alterations during EIA due to the construction of the burial mounds. Furthermore, both settlements occupy outstanding locations from where the residents could watch any movement on the rivers (Drava/Danube) and in their valleys, and control the traffic efficiently. The key position of the two settlements on corridors promoted the involvement of the EIA population in long-distance networks (e.g., Metzner-Nebelsick 1992; Tomedi 2002; Novinszki-Groma 2017a). Besides, similarities between the two study areas are also suspected in the organisation of the funerary landscape: the earliest flat cremation cemeteries seem to have been established close to the supposed entrances of the settlements in both Poštela and Süttő, while the possibly partly contemporary, but mostly slightly younger burial mounds are located further away. Whether other factors (e.g., visibility) besides the position of the existing necropolises have been considered upon the expansion of the occupied territory may only be clarified by further, more deep analyses.

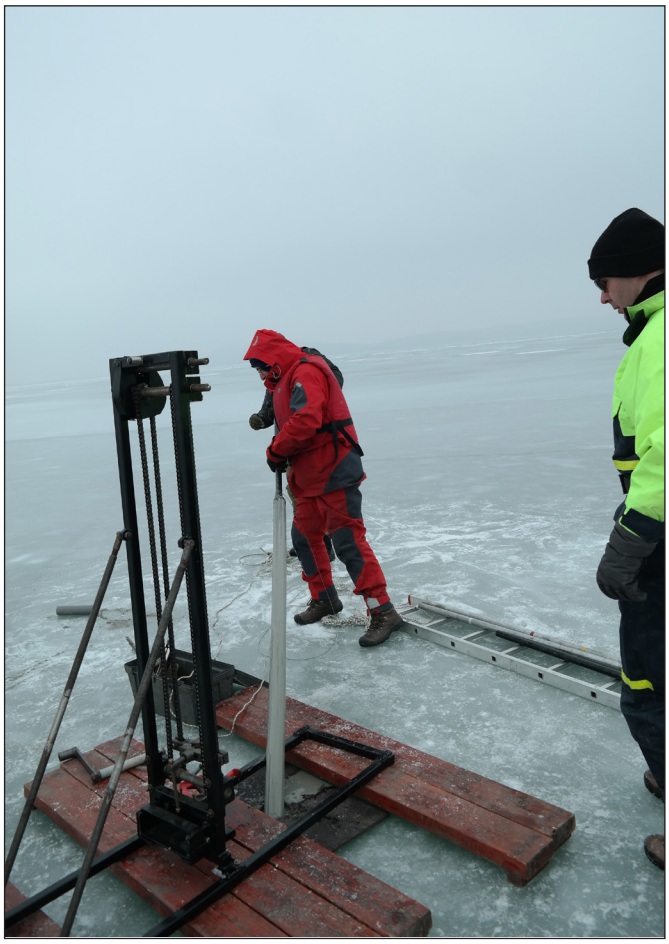

Fig. 6. Taking sediment core Tó-34a in the Balatonszemes Subbasin in January 2010 (photo by Enikő Magyari)

Among further questions of the project, the human impact, that is, the physical and symbolic aspects of constructing monumental fortifications and tumuli, are targeted. That includes both the influence of these monuments on the way later communities used the land and the changes in the land cover (e.g., deforestation) at these sites. In our hopes, besides local data, sediment cores obtained from Lake Balaton, processed by Enikő Magyari (*Fig. 6*), will yield data relevant to this topic, as the pollen spectra of the Balaton samples can refer to major ecological changes in whole Transdanubia. Preliminary results from core Tó34a (Balatonszemes Subbasin, Lake Balaton, 2 km offshore) show that during the Hallstatt Period in Transdanubia (2800–2500 cal BP) oak (*Quercus*), beech (*Fagus sylvatic*s) and horn-

beam (*Carpinus betulus*) were the dominant tree species, while a massive increase in birch (*Betula pendula*) from 5 to 10% around 2800 cal BP points to secondary forest succession after extensive deforestation in the Bronze Age, suggesting an overall reforestation of the region. Walnut (*Juglans regia*), likely of southern origin, started to spread at the beginning of the Hallstatt Period. An increase in the proportion of arable land for cultivating cereals is suggested by a significant increase in the rye (*Secale*) pollen and the trampling/footpath indicator ribwort plantain (*Plantago lanceolata*) around 2500 cal BP. Both the green algae assemblages of the lake (*Pediastrum* species, *Coelastrum*, *Botryococcus*), its calcite/Mg-calcite ratio, and our $\delta^{18}O$ measurements of the biogenic calcite deposit suggest that the lake water had the lowest nutrient content of its entire Holocene history during the Hallstatt Period, while also reaching its highest water level, and summer evaporation was very low. This was accompanied by regions with a >75% tree and shrub cover, pointing to a largely forested landscape in Transdanubia during EIA. In this high woodland cover phase, only one clearance episode could be detected between 2800–2600 cal BP according to our ^{14}C chronology; it likely represents a small-scale deforestation event. The microcharcoal record suggests that forest fires did not play a role in removing the forest vegetation, as the fire intensity was the lowest in this period in the Holocene history of the lake and considerably lower compared to the Bronze Age.

The presented comparative microregional landscape archaeological research project relies on a diverse methodological toolkit and aims to integrate environmental data into the archaeological evaluation. The synchronisation of archaeological and paleoclimatic chronologies, the better understanding of the environmental conditions of Poštela and Süttő, and the recognition of possible EIA human impact on the environment could provide new arguments for the debate on whether major cultural changes can also be linked to significant turns in climatic or environmental trends in the case of the emergence of the Hallstatt Period.

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