

ESZTER BÁNFFY / ALEXANDER GRAMSCH (EDS)

**The Neolithic of the Sárköz
and Adjacent Regions in Hungary:
Bioarchaeological Studies**

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Eszter Bánffy

Editor's introduction: Contributing to the bioarchaeology of Neolithic Sárköz

The monograph series *Confinia et Horizontes* has been launched to disseminate the results of the prehistoric research connected to the *Römisch-Germanische Kommission* (RGK), the 120-year-old research institution of the German Archaeological Institute. Each of its planned subseries concentrates on overarching prehistoric RGK projects: the present volume is part of the subseries on the Sárköz wetland region in southern Hungary. This research programme stems from small excavations at Neolithic Fajsz at the eastern Danube bank and from an immediately following fortunate chance of the extension to major Neolithic sites along the track of the M6 motorway on the western part in the alluvial Danube riverine area. One of these latter sites is the Alsónyék-Bátaszék settlement, a unique mega-site that was occupied for one and a half thousand years and reached a size of up to 80 hectares. In my capacity as deputy director of the Archaeological Institute of (what was then) the Hungarian Academy of Sciences (today the Institute belongs to the Eötvös Loránd Research Network), I headed the team that was responsible for the project, together with the local Wosinszky Mór Museum in Szekszárd, Tolna County. The third player in both the eastern (Kalocsa) and the western (Tolna) Sárköz is the RGK, which commenced extended geophysical prospections in 2011 following my personal invitation. And finally, from 2014 onwards, the RGK established a five-year-long supporting programme, in order to carry out and enhance the approach and interpretation, together with the Hungarian and international team of colleagues.

The basic principles of the publications are planned to focus on archaeological findings and finds, environmental history, landscape archaeology, and bioarchaeology. Our first volume on the Sárköz Neolithic came to light a short while ago (BÁNFFY 2020), with a partly introductory purpose of “setting the scene”: the environmental history of the Danubian Sárköz region.

The spread of the sedentary and food producing lifestyle reached central Europe from the south-east.

During the first centuries of sedentary life, the frontier and interaction zone between the central and the south-easterly regions (especially the northern Balkans) lay in the southern part of the Carpathian Basin. The entire Carpathian Basin was a mosaic-like region of marshy areas, fertile loess lands, and a hilly landscape in the west, with some higher ranges in the north-east. The western part, Transdanubia, has been generally regarded as belonging to central Europe over the millennia since the beginnings of sedentary life, while the southern part of the Great Hungarian Plain (Alföld) has always had close ties to the northern Balkans, i. e. south-east Europe. This contributed to the Carpathian Basin being seen as a frontier, (and meanwhile) a contact zone, a centre of long-distance networks between south-east and central Europe (BÁNFFY / SÜMEGI 2012). Changes in the region had an essential role in the emergence of the food-producing economies and the shift to sedentary lifeways in Neolithic Europe. The recent intensive archaeological and environmental historical research has yielded evidence about the Balkan route of the first farmers, spreading towards central and western Europe, over the Drava and the Danube alluvial wetland, that is, exactly around the Sárköz region. The recognition as such an important corridor made the Sárköz a certain key area for the cultural and genetic formation of the early sedentary way of life and, specifically, in the formation of the Linearbandkeramik (LBK) that soon extended across vast regions from the Paris Basin to Ukraine. The Sárköz and its adjacent regions appear to have acted both as an important divide and as a contact zone and are, as such, parts of the long and wide marginal zone flanking the central Carpathian Basin.

In the research history of the archaeology of the Neolithic, one of the main concerns was the creation of a valid and detailed relative chronological sequence within the Carpathian Basin. This was primarily based on pottery (the traditional typo-chronology of their shapes and decoration), less frequently on stone tools or other arte-

fact types. As a result of archaeological work, the typological description of the finds and the nature of the interaction between the period's cultures were largely clarified by the mid- or later 20th century.

West of the Danube, in Transdanubia, earlier research defined the presence of the Starčevo culture in the south (KALICZ 1990) and the rapid formulation of the LBK groups (KALICZ / MAKKAY 1972). Yet, it has been agreed that many theoretical issues, exact dates as well as the entire nature of the spread have remained questions yet to be solved. The identification of the “missing link” between the Starčevo culture and the earliest developed LBK happened in the early 2000s (BÁNFFY 2000; 2004); yet, to date, this transition can only be traced in the Balaton region and further west. Meanwhile, the exact route and the way how first farmers spread north of the Drava remained unresolved, until the discovery of a robust Starčevo settlement at the Danube-Drava corner in south-east Transdanubia. The intensive Neolithic research along both sides of the Danube in southern Hungary, i. e. the eastern Kalocsa Sárköz and in the western Tolna Sárköz yielded answers for the distribution (BÁNFFY 2013; BÁNFFY et al 2016).

Traditional anthropology goes back a long time in Hungarian research (BARTUCZ 1938; ACSÁDY / NEMESKÉRI 1970), while zooarchaeology, basically founded by Sándor Bökönyi, goes back a few decades only (BÖKÖNYI 1974; 1992), but it is carried out by Bökönyi's one-time students and the next generation. Meanwhile, work on the environmental history became intensive (SÜMEGI / GULYÁS 2004; GÁL et al. 2005; ZATYKÓ et al. 2007), especially after 1989, with research results that are cited and embedded in the first volume of *Confinia et Horizontes* mentioned above (BÁNFFY 2020).

Since the Sárköz bioarchaeological investigations have grown out of the traditional trajectories of archaeology, a brief summary of the 6th–5th millennia history of the Sárköz seems to be useful, especially related to its significance in the spread of people, ideas, and innovations from the northern Balkans towards central Europe.

The eastern (left) side of the modern Danube riverbed was also the focus of intensive archaeological research through the investigation of a concentration of Neolithic settlements extending over some 25 km along the eastern Danube bank. In the area known as the Kalocsa Sárköz, the twin sites of Fajsz-Garadomb and Fajsz-Kovácsalom were investigated as well as the early Neolithic settlement of Szakmár-Kisülés, all lying in this alluvial, riverine flat landscape (BÁNFFY 2013; RASSMANN et al. 2015; 2020a; 2020b).

The foundations of Neolithic archaeology in the western and southern part of Transdanubia were followed up by new discoveries with novel interpretations (BÁNFFY / OROSS 2009; MARTON / OROSS 2012; JAKUCS

et al. 2016; JAKUCS 2020). As reflected by the intensity of sites, features, and finds, the spread of people, ideas, innovations, and then established and sustainable contacts can be tracked in a concentrated way in the Sárköz region. This kind of passage way to central Europe kept its key position after the arrival of the first farmers at the beginning of the 6th millennium: new waves coming from the northern Balkans arrived exactly at this area, which helped to shape the formation of the great Late Neolithic Lengyel cultural circle in Transdanubia and further north and west. Such an impact reached the study area through early Vinča groups beginning with the 53rd century cal BC, by the Sopot groups at the turn of the 6th–5th millennia. Especially the latest, Sopot impact contributed much to the formation of the Late Neolithic Lengyel culture.

In-depth studies on the intensive presence of Lengyel cultural phenomena during the first half of the 5th millennium, identified already in the 19th century, have been conducted since the late 1990ies (e. g. BÁNFFY 1995; REGENYE 2001). The Lengyel settlement and particularly the mortuary remains in south-eastern Transdanubia were the focus of the life work of István Zalai-Gaál (ZALAI-GAÁL 2002; 2009; 2010; 2014; ZALAI-GAÁL / GÁL 2005), whose sad and untimely passing in 2016 leaves a large gap behind. His work is recognised through his contribution to the bioarchaeological studies in the Transdanubian Sárköz by being one of the authors in the present volume.

The proceedings and interpretation of our findings in the Sárköz were based on three research grants and a support programme. The Hungarian Research Fund project “Alsónyék: from the beginnings of food production to the end of the Neolithic”¹ supported the initial work phases: documentation, inventory, the start of the conservation, etc. The grand British-Hungarian project “The times of their lives” led by Alasdair Whittle and Alex Bayliss, part of an ERC AdG funded programme², was also focusing on the Alsónyék site and its adjacent regions. Thanks to the precise chronologies achieved with Bayesian statistical modelling, work and coordination between traditional and bioarchaeological approaches are facilitated.

Between 2014 and 2018, a robust, five-year-long RGK support programme, led by myself. Here, the RGK and its Budapest Research Unit (located at the Institute of Archaeology) carried out a remarkable job, cooperating with the colleagues at the Institute Budapest and hir-

1 OTKA-81230; <http://nyilvanos.otka-palyazat.hu/index.php?menuid=930&num=81230&lang=EN> (last access: 20 June 2022).

2 Grant agreement ID: 295412; <https://cordis.europa.eu/project/id/295412> (last access: 20 June 2022).

ing further local colleagues to contribute. The work involved the *stricto sensu* archaeological proceedings, although one cannot deny that the processing of hundreds of Neolithic dwelling houses, features like refuse pits, ditches, and ditch systems filled with finds exceeding a million, is far beyond a short-term or even a mid-term task. Work packages had to involve the full inventorying, entering data into the databases, reconstructing hundreds of vessels, photographing and drawing thousands of other finds including polished stone tools and flints, grinding stones, and grave goods including rich jewellery of exotic raw materials. Several MA and PhD dissertations are also involved, completed and ongoing, some of them disseminated in the *Confinia et Horizontes* Sárköz subseries. Yet, there is still a long way to go.

The five-year-long support on the part of the RGK involved a full package of non- or minimal-invasive prospections. Molecular investigations have been used in archaeophysical, geophysical, macrobotanical and palynological, and geochemical fields cooperating with traditional archaeology. For its almost revolutionary innovative ways in non- and minimal-invasive archaeology, the Division of Survey and Excavation Methodology of the RGK is a perfect example (RASSMANN et al. 2015; 2020a; 2020b). This plethora of mainly natural sciences in archaeology became completed with the molecular biological analyses in the last 15 years.

Without these projects and support programmes, neither the primary evaluation nor the precise dating based on an impressively robust amount of radiocarbon dates would have been possible. However, there was a fourth research programme in which the Neolithic of the Sárköz gained a strong research focus that, ultimately, made the present volume possible: a pioneer, overarching project investigating the genetic ancestry of a large number of Neolithic and Chalcolithic skeletons. This was the German Research Fund (DFG) project “Bevölkerungsgeschichte des Karpatenbeckens in der Jungsteinzeit und ihr Einfluss auf die Besiedlung Mitteleuropas”, headed by Kurt W. Alt and, on behalf of the Hungarian partners, by Eszter Bánffy³. In the course of the project, the sampling, the archaeological documentation, and the ancient mtDNA analysis of some 700 Neolithic individuals from the Carpathian Basin, among these a large number from Alsónyék and the Sárköz, managed to generate an amount of new data that enabled our research group to endeavour the reconstruction of some novel stories in prehistoric times. The project has yielded research data and food for thought long beyond its termination in 2015. Topics on DNA ancestry in the eastern and in the western part of the Carpathian Basin as well as topics on stable isotope investigations go back partly to dissertations, partly to works of colleagues who generously agreed to take over the piecemeal evaluation

of the data. The data from the Sárköz Neolithic will be repeatedly compared to the neighbouring areas within Transdanubia but also quite often matched with the aims and data gained from the DFG programme in the background. The interpretation of all the results with relevance for social interaction and social identities is mostly the field of social archaeology. Thus, the present volume is largely the publication of these works, rooted in Kurt W. Alt's DFG project.

In the 1990s and especially prior to the unprecedented chance of large-scale developer funded excavations of the 2000s, it was only possible to carry out all these research activities in order to develop new ways / strategies for data processing and interpretation. The post-excavation work and especially the research programmes named above shed exciting new light on the finer details of the intermingling between the Balkan groups and the local population, the various dimensions of the transition to the Neolithic, and the new and repeated restructuring of the demographic, social, and cultural composition. These in turn affected and influenced westward lying regions. In a way, the Sárköz Neolithic has become a key to understand much of the history of the early farming societies in central Europe.

Over the years, several MA and PhD dissertations focused on parts of the material from the Neolithic and Chalcolithic Sárköz. Not all of them could be completed. Some of them will be finished in due course, and those already completed are part of the Sárköz subseries of *Confinia et Horizontes*. The excavation results from the Alsónyék settlement and adjacent sites in the Sárköz yielded a wide range of human osteological and zooarchaeological findings (contribs 02; 03; 07; 08). Besides the basic analyses, our team could also carry out research into the pathologies, mobility, and diet of Neolithic people in the Sárköz. This picture could be enriched by further molecular biological investigations targeting the genetic ancestry of the population groups of the Sárköz with a broad outlook to the east of the Danube (contrib. 06). Thus, the present volume is the summary of the results on various trajectories of bioarchaeology on the 6th and 5th millennia BC Sárköz region.

In this volume, we attempt to begin with the beginning: the results of the physical anthropology's analysis of the first farmers at Alsónyék. The relatively large number of Starčevo burials enabled the anthropologist Kitti Köhler to go beyond the mere metric and morphological evaluation and draw conclusions about demographical issues, details about sexual dimorphism and pathological phenomena of the Early Neolithic bones. To date, there

3 Project number 160237255; <https://gepris.dfg.de/gepris/projekt/160237255?language=en> (last access: 20 June 2022).

are not many Starčevo skeletons known from other sites for comparisons, but the results are in many respects consistent with the aDNA analysis that follows later in this volume.

Following the order that was begun with human osteology, the next large chapter is the updated version of Kitti Köhler's PhD thesis from back in 2012. The situation at Alsónyék with its huge number of Late Neolithic burials is unparalleled in Neolithic Europe. Even the large excavated Lengyel sites contained no more than a few dozen graves – the largest known Lengyel cemetery, Zengővárkony, situated nearby, encompassed 368 graves. Thus, the task of evaluating all 2359 burials from Alsónyék would exceed anyone's possibilities. Kitti Köhler, therefore, concentrated on the most densely occupied area of the site, which still contained almost a thousand burials. The analysis of the skeletons of the Alsónyék Lengyel grave groups is embedded into the history of studying the Lengyel population, completed with statements on the demography and with a sharp focus on the pathology of the human remains. This latter analysis could go beyond the simple observation and description of degenerative illnesses, traces of tumours, caries, or osteoporosis. A further important part of Kitti's work is on infections, including a sensational find of a skeleton with apparent signs of bone tuberculosis from grave group 13, which was immediately published to the benefit of the broader community (KÖHLER *et al.* 2014). The investigation of this burial and its grave group became a perfect example for the cooperation of anthropologists and molecular biologists, who were able to detect the tuberculosis on further members within the same grave group, along with the result that they were an extended family of the person with symptoms of bone tuberculosis.

The traditional osteological investigations are followed by chapters on biomolecular studies. After a planned but discontinued work which was intended to be a PhD thesis, several earlier students of Kurt W. Alt were kind enough to step in and carry out at least some parts of the evaluation. Bone tissue and especially the extremely hard tooth enamel enable isotopic investigations that allow tracing back lifetime mobility of the deceased individuals: to distinguish, if applicable, places they were born from the place they were buried. The data gained from the skeletons need to be compared with the local strontium isotope baseline of the given region. This is frequently faced with the problem that the basis for this comparison, i. e. a reliable baseline, is not elaborate or precise enough for comparing the bone samples to the prehistoric sites they are buried at. Michael Kempf offers – as a kind of prelude to stable isotopic investigations – this comprehensive environmental analysis and gives an integrated description of the sites where GIS-based geo-

logical, pedological, hydrological, topographical, climatic, and historical datasets are combined. The – sometimes – poor quality and quantity of baseline samples on the archaeological sites required developing a new strategy for the strontium isotope baseline determination. These multi-scalar approaches help define the necessary distance and other environmental features to distinguish the scale of baseline values. So, this chapter is necessary for a better understanding of all that is said about stable isotope analyses – at Alsónyék and the Sárköz – with a broad outlook to further areas for comparison.

The next chapter, by Margaux Depaermentier and colleagues, presents the strontium and oxygen stable isotope data for detecting mobility in Neolithic and Copper Age Transdanubia and the Alföld region. It also involves the preliminary results of carbon and nitrogen isotope analyses – a work Alex Mörseburg has been focusing on. This study is based on one of the largest Neolithic samples in Europe to date. Strontium and oxygen isotope analyses of Neolithic human dental enamel enabled the reconstruction of mobility patterns on various temporal and spatial scales through the 6th–5th millennia BC in these two regions.

Apparently, migration and mobility – involving all kinds of social transformation and restructuring along with this mobility – played a key role in the Carpathian Basin during the Neolithic period. These processes can be traced by strontium isotope analysis, which enables the approximation of dietary habits, larger and small-scale mobility patterns, and socio-ecological feedbacks of past human societies. Three kinds of mobility patterns are distinguished with short descriptions and interpretations in terms of changes with time, sex, and age determined mobility, over a long period covering almost two millennia in Transdanubia, compared to the region east of the Danube. The question of whether these patterns are rather connected to chronological, cultural, or social habits is not only posed but also compared to the available aDNA data. It lies in the nature of intertwined methods that the interpretation of isotope data on mobility is cross-checked with both archaeological and genetic results.

Thus, the results of the ancient DNA analyses of the same large area that involve both Transdanubia and the Alföld are summarised in the next chapter. This chapter – like the isotopic study – is based on PhD dissertations. Two theses were written and defended at the University of Mainz, tutored by Kurt W. Alt and co-tutored by myself. Anna Szécsényi-Nagy focused on the mitochondrial DNA data from Transdanubia, with a strong emphasis on the Sárköz and especially on Alsónyék where the largest number of Neolithic skeletons were available. The same task for Neolithic eastern Hungary – the Alföld – was performed by Victoria Keerl, under the same tutorship. The data clearly demonstrate a massive migration

of first farmers, a very limited initial admixture from local hunter-gatherers at the beginning that is, however, slowly increasing over the centuries of the Neolithic, and a restructuring effect of new people and new ideas coming from the northern Balkans. The admixture between different groups that can be observed throughout the entire Neolithic shows interesting parallels to the admixture of archaeological 'cultures' – or rather shared cultural phenomena and customs – and provides food for thought for the future.

Short summaries of the Transdanubian results have already been published (SZÉCSÉNYI-NAGY et al. 2014; 2015), and the somewhat later, autosomal genomic investigation became extended to the east Hungarian samples (LIPSON et al. 2017). However, none of the data were presented and compared together to gain general interpretations that contribute to our current archaeological knowledge. These circumstances make the biomolecular investigations conducted in the course of the original DFG project "Bevölkerungsgeschichte des Karpatenbeckens in der Jungsteinzeit und ihr Einfluss auf die Besiedlung Mitteleuropas" a unique and brave experiment to present stable isotopic and ancient DNA data not only in high impact scientific journals but also in a way that is more embedded in archaeological thinking.

A further PhD thesis was planned on the zooarchaeological finds from the 1300 years of the Alsónyék site. As it happens (more often than desired), this work had also to be abandoned. In order to include an analysis of animal bones in our volume, Anna Zsófia Biller took on the task of carrying out the basic evaluation for the Early Neolithic finds, i. e. the Starčevo bones, only. Even with regard to this part, there are several interesting questions that could not be addressed, such as the apparently marginal role of pigs – this issue will be the subject of a new collaboration within the framework of a new research programme led by Maria Ivanova-Bieg and Marie Balasse – or the increasing importance of cattle over *caprinae* already at this early stage. This latter question has

also been part of a recent book devoted to the monumental clay figurines and their role in household rituals of the first farmers in the Carpathian Basin in connection to the increasing cattle husbandry and early dairy production (BÁNFFY 2019). Some related research questions are investigated and published by a group of researchers involved in the DFG project titled "Food cultures: Interdisciplinary studies of early farming food technology and palaeodiet in south-eastern Europe" led by Maria Ivanova-Bieg (ETHIER et al. 2017; BALASSE et al. 2017)⁴. Other intriguing questions relate to the possibility of tuberculosis earlier than the Lengyel phase at Alsónyék – these are all themes that highlight topics of ongoing zooarchaeological research.

A study on Starčevo mussels is meant to emphasise the significance of the malacological material from Sárköz – not only because of the alluvial, riverine wetland region but also because of its role in the diet and may be even in special social events as indicated by a larger amount of mussels being found in a pit. The chapter reflects just a stage of Balázs Nagy's research work as he continues to process and interpret malacological remains in the region.

The difference regarding the starting points, scopes, and depths of the research summarised in the individual chapters might become the target of some critique. However, the opportunity to present the bioarchaeological studies of such an important region for the European Neolithic was an important factor that led us to the decision not to wait for the completion of each individual study. Two good reasons underpinning this decision have to be mentioned: firstly, as it happens, not all work is going to be carried out entirely, and secondly, the number of unfinished and thus unpublished studies is painfully high. On the positive note, we can trust that the many references to current or planned research on the bioarchaeology of the Sárköz included in this volume are promising for future publications. Last but not least, these future research activities will hopefully be able to use and incorporate the results of the present book.

⁴ Project number 242126187; <https://gepris.dfg.de/gepris/projekt/242126187?language=en> (last access: 20 June 2022).

Kitti Köhler

Biological reconstruction of the Early Neolithic burials excavated at the site of Alsónyék-Bátaszék (South-West Hungary)

Keywords: Early Neolithic, Starčevo culture, south-western Carpathian Basin, Alsónyék, anthropological and palaeopathological analysis

Schlagwörter: Frühneolithikum, Starčevo-Kultur, südwestliches Karpatenbecken, Alsónyék, anthropologische und paläopathologische Untersuchung

Kulcsszavak: kora neolitikum, Starčevo-kultúra, a Kárpát-medence délnyugati része, Alsónyék, embertani és paleopatológiai vizsgálat



Fig. 1. The location of Alsónyék-Bátaszék in Hungary.

INTRODUCTION

Between 2006 and 2009, a series of salvage excavations preceded the construction of the M6 Motorway at the site of Alsónyék-Bátaszék in south-western Hungary (Fig. 1). At the beginning of the excavation, several teams investigated various parts of the site that were initially treated as representing different sites (Fig. 2)¹. Later, these separate sites proved to have been part of a single extensive settlement, which was intensely occupied during the entire Neolithic: the site was successively settled by the Starčevo, the Central European Linearbandkeramik, the Sopot, and the Lengyel cultures.

The various settlement features (pits, ditches, hearths, and ovens) of the Starčevo culture were concentrated mainly in the south-eastern part of the excavated area (the Mérnöki-telep area, Site 5603/1), where c. 500 features of this period were uncovered (Fig. 3), alongside a total of 26 Early Neolithic burials. The graves were scattered randomly across the site, although in some cases, two or three lay quite close to each other. Most of the dead were deposited in a crouched position, but there

¹ The Alsónyék settlement and graves are evaluated as part of the Sárköz Neolithic Landscape project, a collaborative project, directed by Eszter Bánffy, between the Institute of Archaeology of the Research Center for the Humanities, and the *Römisch-Germanische Kommission* of the German Archaeological Institute. The present study was written as part of this project.



Fig. 2. Alsónyék-Bátaszék. Aerial view with the excavated areas (s. a. next contribution, *Fig. 4*).

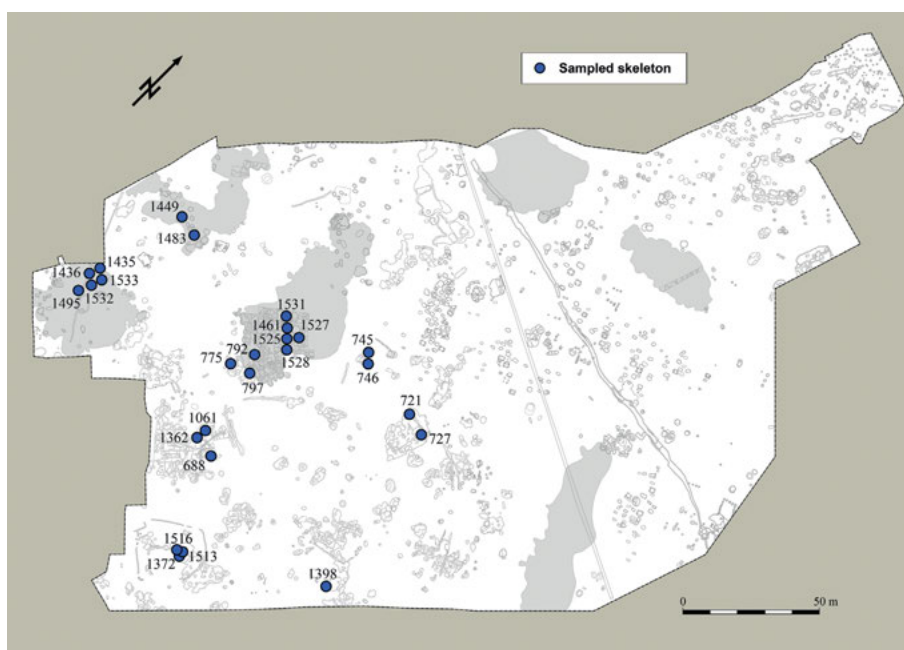


Fig. 3. Alsónyék-Bátaszék. The Mérnöki-telep (5603/1) section of the site with the Early Neolithic burials.



Fig. 4. Alsónyék-Bátaszék. A Starčevo burial deposited inside an oven at the Mérnöki-telep section (after BÁNFFY et al. 2010, 44).

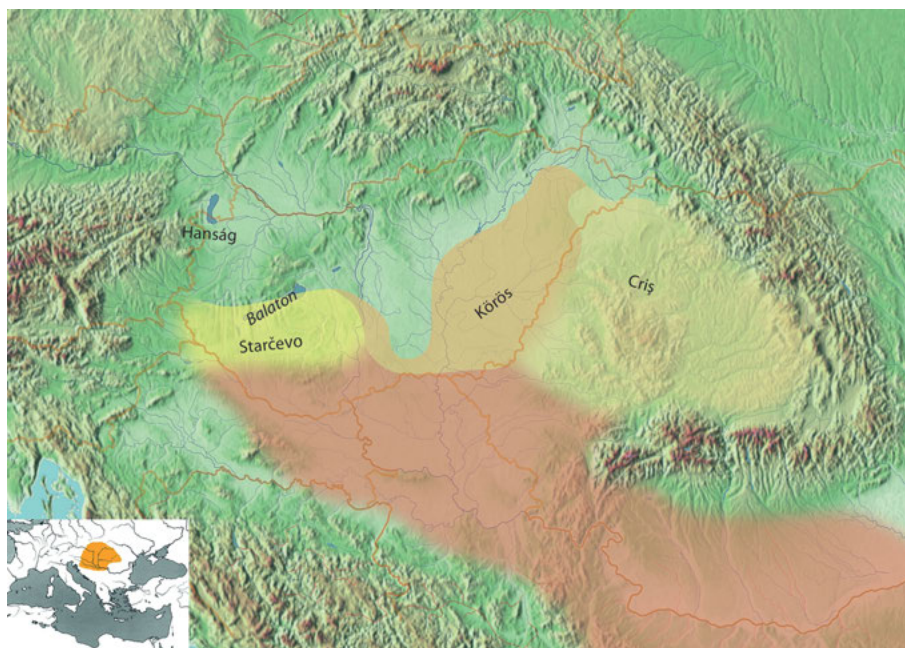


Fig. 5. The distribution of the Starčevo culture (after BÁNFFY 2010, 119).

was no strict orientation. Some were found lying inside subterranean ovens or in front of their opening. None of these skeletons bore any traces of burning, meaning that these ovens were no longer actively used by the time the bodies were deposited in them (Fig. 4; BÁNFFY et al. 2010).

It is by now an established fact that the transition to the Neolithic occurred in the Near Eastern Fertile Crescent after 10 000 cal BC. The spread of farming to Europe has been variously explained by the adoption of farming technologies by indigenous hunter-gatherer populations (cultural diffusion model: BARKER 1985; WHITTLE 1996; BUDJA 1999) or by the migration of early farmers from the Near East (demic diffusion model: CHILDE 1958; AMMERMAN / CAVALLI-SFORZA 1984; RENFREW 1987; PINHASI / CRAMON-TAUBADEL 2009). Yet others combine these two models and argue for small-scale population movements such as infiltration, leap-frog colonisation, or frontier mobility (QUITTA 1964; CHAPMAN 1994; ZVELEBIL 2001; 2002; BÁNFFY 2004). After the expansion of the food-producing way of life, the Starčevo culture was the first sedentary community in South-East Europe, which spread across extensive regions, occupying most of present-day Serbia, Montenegro, Bosnia and Herzegovina, Croatia, Macedonia, and south-western Hungary. Within this vast distribution area (Fig. 5), the number of sites with burials is very low since there were no formal cemeteries in the initial period of the Neolithic (KALICZ 1990; BÁNFFY et al. 2010). The deceased were buried on the settlements in

secondarily used borrow and refuse pits, or, more rarely, in grave pits dug among the houses. To date, 143 individuals from 26 sites have been examined (Tab. 1). Among these, Alsónyék provided the largest sample, offering a unique opportunity to increase our knowledge of the Starčevo population.

The anthropological picture of the Starčevo culture is still uncertain due to the relatively low number of excavated and anthropologically investigated burials. Previous studies mainly focused on systematic taxonomic and typological analyses, while little attention was paid to pathological alterations. The goal of this paper is to examine both aspects of these Early Neolithic individuals.

MATERIALS AND METHODS

The skeletons are generally poorly preserved. In most cases, the skulls are very fragmented and unsuitable for measuring purposes, while the postcranial bones are relatively well preserved. The anthropological material is stored in the Wosinsky Mór County Museum in Szekszárd (County Tolna).

In the case of subadults (0–14 years), the estimation of the age-at-death was based on the development and eruption sequence of deciduous and permanent teeth (SCHOUR / MASSLER 1941; UBELAKER 1989) and on the length of the long bones (STLOUKAL / HANÁKOVÁ 1978; BERNERT et al. 2007). In the case of juveniles (15–20 years), the tables detailing the epiphyseal fusion of the

Sites	Infans	Male	Female	Adult	?	Total
Alsónyék-Bátaszék	7	6	11	2	–	26
Ajmana-Mala Vrbica	12	3	2	–	–	17
Divostin	–	–	1	–	–	1
Jaruge-Godevo	–	1	–	–	–	1
Kozármisleny, Sasfészek [M6/56]	3	2	2	–	–	7
Kudoš-Šašinci	–	–	–	1	–	1
Lánycsók	1	–	1	–	–	2
Lánycsók-Gata-Csotola	1	3	3	5	–	12
Lepenski Vir	1	2	10	–	–	13
Novi Sad-Klisa, Gasovod RG, Gospodinci-Futog	1	1	1	–	–	3
Obrež-Baštine	1	–	–	–	–	1
Odžaci-Donja Branjevina	1	1	–	–	–	2
Rudnik Kosovski	–	1	3	1	–	5
Siklós-Elkerülő út	–	–	1	–	–	1
Srarčevo-Grad	1	–	1	–	–	2
Szajk-Szajki szántók [60/73]	–	3	4	–	–	7
Ušće Kameničkog potoka	–	1	–	–	1	2
Velesnica	3	1	5	–	–	9
Vinča	–	–	10	–	–	10
Vinkovci-“NAMA”	1	4	4	–	–	9
Vizić-Golokut	–	–	3	–	–	3
Vörs-Máriaasszonysziget	–	–	1	–	–	1
Vukovar-Visoka škola	3	1	1	–	–	5
Zlatara kod Rume	1	1	1	–	–	3
Total	37	31	65	9	1	143

Tab. 1. Anthropologically examined sites of the Starčevo culture.

long bones were used (FEREMBACH et al. 1979; SCHINZ et al. 1952). Adults' age was estimated from the stage of cranial suture closure (NEMESKÉRI et al. 1960; MEINDL / LOVEJOY 1985), the extent of dental attrition (MILES 1963; PERIZONIUS / POT 1981), the morphological changes of the symphyseal face of the pubic bone (TODD 1920), and the changes of the sternal end of the ribs (IŞCAN et al. 1984; 1985).

Morphological sexing was performed according to the traditional procedure (ÉRY et al. 1963; UBELAKER 1989).

When measuring and calculating the indices of the skulls and postcranial bones, MARTIN / SALLER's (1957) method was applied, while the values thus gained were assigned to the categories defined by ALEKSEIEV / DEBETZ (1964). We examined nine traits during the morphological description of the skulls (MARTIN / SALLER 1957). Stature was estimated using Pearson-Rösing's (RÖSING 1988), Sjøvold's (SJØVOLD 1990), and Bernert's (BERNERT 2005; 2008) calculation formulae. We assessed the so-called hereditary anatomical variations (HAUSER / DE STEFANO 1989), the pathological changes (MANCHESTER 1983; AUFDERHEIDE / RODRIGUEZ-MARTÍN 1998; ORTNER 2003), and the dental status (LUKÁCS 1989).