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ABBREVIATIONS

AAR	Analecta Archaeologica Ressoviensia (Rzeszów)
ActaArch	Acta Archaeologica (Leiden)
ActaArchHung	Acta Archaeologica Academiae Scientiarum Hungaricae (Budapest)
ActaMusPapensis	Acta Musei Papensis. A Pápai Múzeum Értesítője (Pápa)
Agria	Agria. Az Egri Múzeum Évkönyve (Eger)
AJPA	American Journal of Physical Anthropology (New York)
Alba Regia	Alba Regia. Annales Musei Stephani Regis (Székesfehérvár)
AnB	Analele Banatului. Buletinul Muzeului din Timişoara (Timişoara)
Antaeus	Antaeus. Communicationes ex Instituto Archaeologico (Budapest)
AnthrAnz	Anthropologischer Anzeiger (München)
AnthrK	Anthropológiai Közlemények (Budapest)
Antiquity	Antiquity. A Review of World Archaeology (Durham)
AÖ	Archäologie Österreichs (Wien)
Apulum	Apulum. Acta Musei Apulensis (Alba Iulia)
AR	Archeologické Rozhledy (Praha)
ArchA	Archaeologia Austriaca (Wien)
ArchBulg	Archaeologia Bulgarica (Sofia)
ArcheoSciences	ArcheoSciences. Revue d'Archéométrie (Rennes)
ArchÉrt	Archaeologiai Értesítő (Budapest)
ArchHung	Archaeologia Hungarica (Budapest)
Archiv für Anthropologie	Archiv für Anthropologie. Völkerforschung und kolonialen Kulturwandel (Braunschweig)
ArchKözl	Archaeologiai Közlemények (Budapest)
Arrabona	Arrabona. A Győri Xantus János Múzeum Évkönyve (Győr)
ASM	Archeologické Studijní Materiály (Praha)
AUB	Annales Universitatis Budapestinensis de Rolando Eötvös Nominatae (Budapest)
AVANS	Archeologické Výskumy a Nálezy na Slovensku (Nitra)
Balcanica	Balcanica. Annuaire du Comité Interacadémique de Balkanologie du Conseil des Académies des Sciences et des Arts de la R. S. F. Y. et de l'Institut des Etudes Balkaniques (Beograd)
BAR-IS	British Archaeological Reports – International Series (Supplementary) (Oxford)
BBV	Berliner Beiträge zur Vor- und Frühgeschichte (Berlin)
bioRxiv	bioRxiv. The Preprint Server for Biology
BRGK	Bericht der Römisch–Germanischen Kommission (Berlin)
BROB	Berichten van de Rijksdienst voor het Oudheidkundig Bodemonderzoek (Amersfoort)
BudRég	Budapest Régiségei (Budapest)
CommArchHung	Communicationes Archaeologicae Hungariae (Budapest)
Crisia	Crisia (Oradea)
CurrAnt	Current Anthropology (Chicago)

DissArch	Dissertationes Archaeologicae ex Instituto Archaeologico Universitatis de Rolando Eötvös nominatae (Budapest)
DMÉ	A Debreceni Déri Múzeum Évkönyve (Debrecen)
DocPraehist	Documenta Praehistorica (Ljubljana)
Dolg	Dolgozatok az Erdélyi Múzeum Érem- és Régiségtárából (Kolozsvár)
Dolgozatok	Dolgozatok a Magyar Királyi Ferencz József Tudományegyetem Archaeologiai Intézetéből (Szeged)
DuDolg	Dunántúli Dolgozatok (Pécs)
DuSz	Dunántúli Szemle (Szombathely)
EJA	European Journal of Archaeology (London)
Építés-Építészettudomány	Építés- Építészettudomány. A Magyar Tudományos Akadémia Műszaki Tudományok Osztályának Közleményei (Budapest)
EurAnt	Eurasia Antiqua. Zeitschrift für Archäologie Eurasiens (Bonn)
FAM	Fontes Archaeologiae Moravicae (Brno)
FolArch	Folia Archaeologica (Budapest)
FontArchHung	Fontes Archaeologici Hungariae (Budapest)
FrK	Földrajzi Közlemények (Budapest)
FSI	Forensic Science International. Genetics
FtK	Földtani Közlöny (Budapest)
GCBI	Godišnjak Centra za Balkanološka Ispitivanja Akademije Nauka i Umjetnosti Bosne i Hercegovine (Sarajevo)
Germania	Germania. Anzeiger der Röm.-Germ. Kommission des Deutschen Archäologischen Instituts (Mainz)
Gesta	Gesta. Historical Review (Miskolc)
HHR	The Hungarian Historical Review (Budapest)
HOMÉ	A Herman Ottó Múzeum Évkönyve (Miskolc)
HungArch	Hungarian Archaeology. E-Journal (Budapest)
JAA	Journal of Anthropological Archaeology (New York)
JAHA	Journal of Ancient History and Archaeology (Cluj-Napoca)
JAR	Journal of Archaeological Research (New York)
JAS	Journal of Archaeological Science (London)
JFA	Journal of Field Archaeology (Boston)
JFS	Journal of Forensic Sciences (Chicago)
JHE	Journal of Human Evolution (New York)
JIES	The Journal of Indo-European Studies (Washington, D. C.)
JLS	Journal of Lithic Studies (Edinburgh)
JPMÉ	A Janus Pannonius Múzeum Évkönyve (Pécs)
JWP	Journal of World Prehistory
KMK	A Komárom megyei Múzeumok Közleményei (Tata)
KMMK	Komárom-Esztergom Megyei Múzeumok Közleményei (Tata)
KRMK	A Kaposvári Rippl-Rónai Múzeum Közleményei (Kaposvár)
Marisia	Marisia. Studii şi Materiale. Muzeul Judeţean Tîrgu Mureş (Tîrgu Mureş)
MatArchSlov	Materialia Archaeologica Slovaca (Nitra)
MCA	Materiale şi Cercetări Archeologice (Bucureşti)
Menga	Menga. Revista de prehistoria de Andalucía. Journal of Andalusian Prehistory (Antequera)
MFMÉ	A Móra Ferenc Múzeum Évkönyve (Szeged)
MFMÉ StudArch	A Móra Ferenc Múzeum Évkönyve – Studia Archaeologica (Szeged)

MKCsM	Múzeumi Kutatások Csongrád Megyében (Szeged)
MRT	Magyarország Régészeti Topográfiája (Budapest)
Musaica	Musaica Archaeologica. Zborník Filozofickej Fakulty University Komenského (Bratislava)
Nartamongæ	Nartamongae. The Journal of Alano-Ossetic Studies. Epic, Mythology and Language (Vladikavkaz)
OA	Opuscula Archaeologica (Zagreb)
Ossa	Ossa. International Journal of Skeletal Research (Solna)
Ősrégészeti Levelek	Ősrégészeti Levelek. Prehistoric Newsletter (Budapest)
PBF	Prähistorische Bronzefunde (München)
PLoS One	PLoS One. E-Journal (San Francisco)
PNAS	Proceedings of the National Academy of Sciences (Washington, D. C.)
Pravěk	Pravěk (Brno)
Preistoria Alpina	Preistoria Alpina (Trento)
PZ	Praehistorische Zeitschrift (Berlin)
QuaternaryInt	Quaternary International. The Journal of the International Union for Quaternary Research (Oxford – New York)
Radiocarbon	Radiocarbon. An International Journal of Cosmogenic Isotope Research (Tucson)
RégFüz	Régészeti Füzetek (Budapest)
SA	Советская Археология (Moskva)
Satu Mare	Satu Mare. Studii şi comunicări. Seria Arheologie (Satu Mare)
Savaria	Savaria (Szombathely)
SbČSA	Sborník Československé Společnosti Archeologické (Brno)
SCIV	Studii şi Cercetări de Istorie Veche (Bucureşti)
SlA	Slovenská Archeológia (Bratislava)
SMK	Somogyi Múzeumok Közleményei (Kaposvár)
Specimina Nova	Specimina Nova. Dissertationum ex Instituto Historiae Antiquae et Archaeologiae Universitatis Quinqueecclesiensis (Pécs)
SSz	Soproni Szemle (Sopron)
StComit	Studia Comitatensia (Budapest)
SzIKMK	A Szent István Király Múzeum Közleményei (Székesfehérvár)
Terra Sebus	Terra Sebus. Acta Musei Sabesiensis (Sebes)
Tisicum	Tisicum. A Jász-Nagykun-Szolnok Megyei Múzeumok Évkönyve (Szolnok)
UF	Ugarit-Forschungen. Internationales Jahrbuch für die Altertumskunde Syrien-Palästinas (Kevelaer – Neukirchen– Vluyn)
UPA	Universitätsforschungen zur prähistorischen Archäologie (Bonn)
VAH	Varia Archaeologica Hungarica (Budapest)
VetZoot	Veterinarija ir Zootechnika. A scientific journal and the Official Organ of the Veterinary Academy, Lithuanian University of Health Sciences (Kaunas)
VKT	Várak, kastélyok, templomok. Történelmi és örökségturisztikai folyóirat (Pécs)
VMMK	A Veszprém Megyei Múzeumok Közleményei (Veszprém)
VýP	Východoslovenský Pravek (Košice)
WMMÉ	A Wosinsky Mór Múzeum Évkönyve (Szekszárd)
ZalaiMúz	Zalai Múzeum (Zalaegerszeg)
ZbSNM	Zborník Slovenského Národného Múzea. Archeológia (Bratislava)
Ziridava	Ziridava. Studia Archaeologica (Arad)
ZSNM	Zbornik Slovenského Národného Múzea (Ljubljana)

FOREWORD FROM THE EXECUTIVE EDITOR

As with the previous (37th) issue of the Antaeus (Yearbook of the Institute of Archaeology), the present volume brings together a selection of research papers addressing a certain time period; the Bronze Age on this occasion. The current volume, despite containing fewer studies than the previous issues, is in line with the editorial board's ambition to publish a new volume at regular – annual – intervals, even at the expense of the overall length of the publication. With the aim to assemble a broad spectrum of Bronze Age research studies from the territory of Hungary, the current issue touches upon a wide range of themes stretching across the many hundreds of years of the Bronze Age period: from the facial reconstruction of an Early Bronze Age woman, to the domestication of horses and Middle Bronze Age dress ornaments, to the study of the large, Late Bronze Age fortified settlements. These topics cover the key issues of current European Bronze Age research, including the archaeological application of DNA analyses, and the theoretical approaches of political economies, therefore the outcomes presented here will hopefully be of wide international interest. Some of the research was carried out within the framework of the Lendület/Momentum Mobility Research Group launched in 2015, supported by the Hungarian Academy of Sciences at the Institute of Archaeology, Research Centre for the Humanities.

The paper by Ágnes Kustár and her colleagues presents the facial reconstruction of an Early Bronze Age female burial. The work serves as the first facial reconstruction study where DNA data was also considered regarding the pigmentation (eye and hair colour, skin tone) of a Bronze Age individual from present-day Hungary.

The two studies put forward by Eszter Melis and Gabriella Kulcsár as main authors, both discuss the results of micro-regional settlement investigations aimed to explore Early and Middle Bronze Age settlement structures using non-destructive methods. The settlement investigations conducted by Eszter Melis and her team focussed on the region of Nagycenk, nearby Lake Neusiedl. The data published here represents a significant piece of archaeological research as information from the region occupied by the Gáta–Wieselburg culture has been lacking in the past three decades. Furthermore, the site of Nagycenk-Kövesmező is one of the few Gáta–Wieselburg settlements investigated by a modern archaeological excavation.

Gabriella Kulcsár and her team discuss the Middle Bronze Age pit burial of a mature adult female with evidence for multiple physical trauma, from Central Hungary. The study touches upon the interpretation of pit burials in the context of the settlements of Bronze Age communities who otherwise practiced inhumation and cremation as their nominal mortuary tradition.

Géza Szabó's paper examines the so-called Tolnanémedi-type hoard horizon comprised primarily of dress ornament assemblages across to the Middle Bronze Age along with a newly discovered hoard from Mucsi in Tolna county. The publication includes the reconstruction of a costume worn by high status female members of the Transdanubian Encrusted Pottery culture and provides an interpretation of the symbolism of such ornaments.

The study by Gábor Ilon provides an overview of Bronze Age moulds and their distribution in the Carpathian Basin. The paper considers the assemblage as important evidence for local metallurgy, and sheds new light on the organisation and specialisation of bronze production.

Róbert Bozi and Géza Szabó explore the question of horse domestication within the context of Bronze Age cultures in Central and Eastern Hungary, based on the evidence of horse gear made of antler appearing first during the 2nd millennium in the Carpathian Basin. The study relies on newly discovered horse remains and their associated absolute dates.

The paper by Vajk Szeverényi and his colleagues discusses the results of their most recent excavation programme conducted at Csanádpalota; a prime example of a so-called 'mega fort' or large-scale fortified settlement typical in the Late Bronze Age in Southeast Europe. Anna Priskin in her study gives a detailed insight into the production and use of grinding stones recovered at the site.

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ANNA PRISKIN

THE ANALYSIS OF BRONZE AGE MACROLITHIC TOOLS A CASE STUDY FROM CSANÁDPALOTA-FÖLDVÁR (SOUTHEASTERN HUNGARY)

Zusammenfassung: Folgender Überblick beschreibt die Ergebnisse der Analyse, der das makrolithische Material der spätbronzezeitlichen befestigten Siedlung am Fundort Csanádpalota-Földvár unterzogen wurde (Ausgrabungen der Autobahn M43 zwischen 2011 und 2013). Ziel der Arbeit war einerseits die Unterbreitung einer neuen und in der ungarischen Forschung bis dato nicht verwendeten Methodik zur Analyse von makrolithischen Gegenständen, andererseits die Betonung der Nützlichkeit besagter Methodik für sozialarchäologische Schlussfolgerungen bezüglich prähistorischer Gesellschaften. Die Forschungsarbeit ist eine experimentelle Studie, die sich mit der auf makrolithischen Gegenständen basierenden, vergleichenden Analyse des spätbronzezeitlichen Siedlungssystems und der Wirtschaft Südost-Ungarns auseinandersetzt. Unsere Ergebnisse deuten nicht auf eine Zentralisierung der Produktion an den befestigten Siedlungen hin.

Keywords: macrolithic implements, functional analysis, economy, Bronze Age, Southeastern Hungary

On the Békés-Csanádi-plateau (southeastern part of the Great Hungarian Plain) in the middle phase of the Late Bronze Age (ca. 1350–1100 BC) fortified settlements, often with monumental sizes, emerged, surrounded by smaller fortified sites and even smaller non-fortified villages and hamlets. According to one possible interpretation, this settlement pattern could have had multiple tiers in a hierarchical structure, where fortified and unfortified settlements had a super-/subordinate relationship. Currently we are conducting a micro-regional, multi-scalar, interdisciplinary research project aimed at the investigation of the social, political and economic organization of Bronze Age communities in SE Hungary and the neighbouring areas of Romania, with a focus on the Late Bronze Age.[1]

Part of the investigation of each settlement is the analysis of macrolithic tools with a multilevel methodology, whose results will contribute to the reconstruction of Bronze Age subsistence economy. The present study is aimed at the brief presentation of the methodology and the first results of the analysis of the Late Bronze Age macrolithic material from Csanádpalota-Földvár (previously Csanádpalota, Juhász T.-tanya, M43 motorway Site 43/55).[2]

[1] The project has received funding from a number of sources during the previous years: Hungarian National Fund (NKA, Grant Nos. 3234/230, 207134/306 and 207134/00383), National Research, Development and Innovation Office (OTKA FK 135805), Wenner-Gren Foundation (Dissertation Fieldwork Grant no. 9472).

[2] The analysis and its results are part of my PhD thesis titled Subsistence and Society: Analysis of macrolithic tools and subsistence economy in the Late Bronze in the southern Great Hungarian Plain in preparation at the Universitat Autònoma de Barcelona.

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The attention paid, and significance assigned in Hungarian research to macrolithic tools – and consequently the number of publications analysing them – is still negligible compared to other classes of finds. Nevertheless, the Bronze Age is still among the better researched periods in this regard. Thanks to the research by Katalin T. Biró and Tünde Horváth, there are quite a few publications on lithic finds. It has to be noted, however, that they focused primarily on chipped and polished stone tools, and less on macrolithic implements. The lithic material of Middle Bronze Age 'Vatya' settlements (multi-layered tells) in central Hungary have been examined in more detail. Thus this period is better researched regarding stone tools.[3] Tünde Horváth's work filled a large gap, and it is still the only work on the analysis of macrolithic tools in Hungarian archaeology. The investigation of macrolithic material from Late Bronze Age settlements is even scarcer; only the analyses of two sites have been published in Hungary.[4]

Theoretical background

In recent years an increasingly lively debate has emerged about the character of Bronze Age European societies. During the past decades a major school of thought has suggested that European Bronze Age societies are characterized by some form of chiefdom type socio-political organization.[5] According to this approach, one archaeological evidence for chiefdoms is the presence of multi-level settlement hierarchies with large, fortified centres at the top tier. As mentioned above, during the middle phase of the Late Bronze Age a series of mega-forts appeared in the southern part of the Great Hungarian Plain (e.g. Csanádpalota, Corneşti-Iarcuri [Romania], Sântana-Cetatea Veche [Romania], Iđoš-Gradište [Serbia]). These could, in theory qualify as the centres of such polities. In these chiefdom type societies[6] the sources of the power of political leaders are manifold, and can be military, ideological and economic in nature. Regarding the economy, it has been theorized that political leaders achieved and maintained their power through the control of two sources: (1) control over the subsistence economy, food production and food processing, termed staple finance[7] or corporate strategies;[8] (2) control over specialist craftsmanship, exotic objects and exchange with other communities, termed wealth finance[9] or network strategies.[10] Another group of researchers identifies already the earliest (non-Aegean) states in European history in the Bronze Age of Southwestern and Central Europe.[11]

This has been questioned recently by another, increasingly vocal school, which suggests that the concept of chiefs and chiefdoms is outdated and cannot be a priori assumed for Bronze Age European societies.[12] These studies suggest, among others, that power is not a priori given, but must be negotiated and maintained; it is not static, vested in a single person ('chief'), but fluid, dispersed and contextually specific. The concept of heterarchy perhaps fits this approach better, and provides a framework for understanding complex, lateral networks within a society.[13] This

[3] *Horváth 2000; Horváth 2004* 1–339; *Horváth 2005; Horváth et al. 2016; Horváth – Kozák – Pető 1999; Horváth – Kozák – Pető 2000a; Horváth – Kozák – Pető 2000b.*
[4] *T. Biró 1995a; T. Biró 1996.*
[5] *Gilman et al. 1981; Kristiansen 1991; Kristiansen 1998; Earle 1997.*
[6] *Service 1962; Carneiro 1981; Earle 1987; Earle 1991; Earle 1997.*
[7] *D'Altroy et al. 1985; Earle 1997* 70–73.
[8] *Blanton et al. 1996; Feinman 1995; Feinman 2001.*
[9] *D'Altroy et al. 1985; Earle 1997* 73–75.
[10] *Blanton et al. 1996; Feinman 1995; Feinman 2001.*
[11] *Lull et al. 2010; Lull et al. 2011; Lull et al. 2013; Meller 2019.*
[12] *Pauketat 2007; Kienlin 2012; Brück – Fontijn 2013.*
[13] *Ehrenreich – Crumley – Levy 1995; Pauketat 2007* 62–63.

approach clearly requires more data on variation in patterns of production and consumption not associated with central settlements.

Based on the analysis of macrolithic materials from individual sites I investigate how these competing approaches can be reconciled with the evidence on the organization of the subsistence economy and food processing. The study of the control over food production and food processing is of great relevance and will provide the starting hypothesis, as staple finance or corporate strategies emphasize control over subsistence production and the mobilization of staple surplus. It means the ability of leaders to generate surplus from the lands owned by the group. Such surplus is sometimes collected as tribute and kept in storage areas in central settlements, close to the residence of the leaders, and then redistributed among followers.

The analysis of the spatial and contextual distribution of macrolithic tools used for food processing may shed light on the organization of production. The concentration of such finds in larger numbers at fortified central sites may indicate central control, while the lack of such concentration may indicate a less hierarchical access to foodstuffs, primarily grain, or the lack of tribute based economies.

One of the simplest forms of redistribution is the provision of feasts. Here control over the preparation of food is especially important.[14] Evidence for such feasts can indeed be found in the LBA material in the study area, indicated by special deposits that often include macrolithic material as well.[15]

Methodology

Definition of macrolithic or ground stone tools

According to Selina Delgado-Raack and Roberto Risch, the category of ground stone or macrolithic tools refers to lithic artefacts manufactured from sedimentary, igneous, and metamorphic rocks, and can be manufactured by percussion, polishing or abrasion. It includes lithic implements that can be used for abrasion, polishing, grinding, pounding, pulverizing, etc.: abraders, polishers, smoothers, grinding tools, percussors, hammer stones, anvils, axes, casting moulds, etc.[16]

Following Jenny L. Adams' approach, macrolithic tools can be categorized into groups based on the types of activities carried out with them. Processing tools (1) include grinding, pounding and pulverizing tools used to transform certain materials. Manufacturing tools (2), such as abraders, percussion tools, etc. are used to form other implements. Tools and paraphernalia (3) manufactured by abrasion, polishing or impaction are used as everyday objects, such as axes, moulds, containers, jewellery, statues, or even worked building stones. Implements used for the forming of both ground stone tools and flaking tools are pecking stones or hammer stones (4).[17] Their sizes usually depended on the size of the available raw materials: e.g. pebble-based polishers used during pottery manufacture are a few cm large, while a larger grinding slab can reach up to 50-60 cm in length. The extent of the use of macrolithic tools in various prehistoric periods is more or less similar, but there are no significant formal/typological differences between the tool types of these periods. Consequently, this class of objects is less suitable for typo-chronological analyses. Instead of formal analysis, the functional analysis of such objects is much more promising. Tools of similar shape could be used for varied purposes, and a single specimen could be implemented for a number of different activities, creating multiple working surfaces on the object. Through the study of macrolithic implements we can gain information on (1) the

[14] *Dietler 1990; Dietler 1996; Dietler 2001; Hayden 1996; Hayden 2001.*
[15] *Szeverényi – Priskin – Czukor 2014; Szeverényi et al. 2015.*
[16] *Delgado-Raack – Risch 2009.*
[17] *Adams 2002* 1.

exchange network of the given community through which the socially appropriated raw material was acquired, (2) the work object as intentionally created by people from the raw materials, and (3) the work means, the activities and transformative work on other raw materials with the help of macrolithic tools.[18]

Analytical method

The analysis of the macrolithic material is carried out based on a three-level methodology. At the first level, I analyse the individual macrolithic tools based on the various parameters detailed below. At the second level, I carry out the contextual analysis of the macrolithic tools within the given sites, through the comparison of the various types of features, finding spots and tool types. At the third level, I attempt to reconstruct the Late Bronze Age subsistence economy and its organization at a microregional level based on the comparative analysis of the lithic material of the various types of settlements of the microregion.[19] For the data to be comparable, identical data registration and analytical method is required. Csanádpalota-Földvár was the pilot site, where the methodology was first employed. During later fieldwork and analysis, minor modifications were made, primarily in sampling methods (e.g. taking soil samples from the immediate environment of grinding stones), as a result of which the spectrum of applicable analytical methods widened.

During excavation, all lithic finds were collected systematically, and contexts were documented in detail. As a result of maximum lithic find recovery, there is a large amount of lithic tools and raw materials in the collection. The recovery of lithic finds was complemented with systematic soil sampling from all contexts and features. As a consequence, we have good botanical data.[20]

The systematic inventory of the macrolithic material was carried out based on the method developed by Roberto Risch and complemented and refined by Selina Delgado-Raack.[21] During the classification of the macrolithic tool types I used the terminology developed by Roberto Risch, complemented with Jenny J. Adams' observations.[22]

The first step of the analysis, morphometric investigation means the analytical description of the tools based on metric, formal characteristics and preservation of the tools. Based on the preservation of tools, we can gain insight into how long the implements found at the given settlement were in use. In lack of close raw material sources it may be assumed that implements made of high quality raw materials were made use of as long as possible: for example, after the breakage of a larger-sized implement, the remaining piece may have gained a new function, and may have been used as long as its size permitted (perhaps with new and new functions). Based on the extent of fragmentation, I categorized the material into three groups. Group 1 contains completely intact implements; Group 2 contains pieces whose preserved size is at least one third of the original implement; and Group 3 contains the more fragmented lithics preserved to less than one third of their original sizes.

The classification of macrolithic tools is carried out based on the morphological and petrographic characteristics and assumed function.[23] The categories listed below include only those tool types that are attested in the studied material.

[18] *Risch 2008*.
[19] The results of the analysis of the third level will be presented in a future paper.
[20] The archaeobotanical analysis was carried out by Andrea Torma.
[21] *Risch 1995; Delgado-Raack 2008*.
[22] *Adams 2002*.
[23] *Adams et al. 2009; Delgado-Raack – Gómez-Gras – Risch 2009; Delgado-Raack – Risch 2009.*

Abrader (ALS):[24] small handheld tools with one or two coarse working surface. They could have been used for the removal of certain substances from a surface or for the transformation of a surface.

Abrader/whetstone (ALS/PIA): fine-grained tools with two or more working surfaces. They could have been used for the transformation of surfaces or for metal sharpening, the latter case is usually indicated by a grooved working surface.

Abrader/hammerstone (APE): tools with two or more active working surfaces with percussion and abrading use-wear traces.[25]

Flake (LAS): a removed piece of raw material created as a result of percussion.

Stone slab (LOS): abrasive slab with abrasive active surface, usually a large-sized slab.[26] Adams defined a separate category for the so-called lapstone, which is a smaller, handheld implement with use-wear traces of abrasion, sheen or impact fractures on the surface, depending on the type of activity it had been used for.[27] The implement could be used for the processing of both animal or plant based foodstuffs.[28]

Mace (MAM): a rounded, perforated artefact.[29]

Mould (MDE): stone mould for the casting of metal objects. It has the negative shape of the metal object on its obverse side, and usually has traces of heating on its surface.

Grinding slab (MOL): large sized stone tools, the lower, passive piece of the double grinding equipment, usually with abrasion use-wear traces on the obverse and reverse sides, and percussion and friction traces on the obverse side.

Handstone/grinder (MUE): the upper part of the grinding equipment with abrasive traces on the obverse and reverse side of the tool.

Hammerstone (PEC): a usually irregularly shaped, handheld tool formed from a large pebble. Traces of strong blows can be seen on the active surface.[30]

PEC-PIA-YUN: multifunctional tool with two active and a passive working surface.

The analysis of lithic raw materials is based on macroscopic investigation and the petrographic analysis of thin sections. The results are compared to the database of lithic raw materials in Hungary. In an earlier phase of research, we attempted to identify primary (mine) and secondary (river sediments) raw material sources through field surveys.[31]

Functional analysis is based on the observation of manufacture and use-wear traces, as a result of which grinding tools, abrading tools, pecking tools and percussion tools can be distinguished. The various tools could have played an active or a passive role during these activities. Use wear traces on the surface of the implements will provide information on the manufacture of the tools (e.g. reuse or transformation of a used implement) or their use. It can be determined what kind of materials they came in contact with (bone, leather, wood, pottery, pigments), what kinds of changes these caused on the surface of the tool.[32]

[24] The abbreviations used refer to the Spanish names of the various tool types.
[25] *Vučković 2019* 24.
[26] *Risch 1995* 41.
[27] *Adams 2002* 145.
[28] *Delgado-Raack et al. 2020* 13.
[29] *Vučković 2019* 26.
[30] *Adams 2002* 151.
[31] Petrographic analysis was carried out by Dr. Bálint Péterdi.
[32] *Adams 2008; Bofill 2012; Bofill et al. 2013; Dubreuil – Savage 2013; Tsoraki 2007.*

Contextual analysis involves the study of the settlement features and the find contexts of the macrolithic stone implements. During contextual analysis I examine the relationship between the excavated features and the macrolithic finds they yielded, and the possible patterns that can be recognized. Based on the given settlement features and the tool types found in them it can be determined what kinds of activities had been carried out in the given area, we may even reconstruct special activity areas (e.g. for food preparation, metallurgical or pottery workshop). The extent of the fragmentation of the tools and their quantity may also provide clues to the function of the given feature.[33]

Materials

Csanádpalota-Földvár

The site of Csanádpalota-Földvár is located in Southeastern Hungary, 1.5 km south of the modern town, a few hundred meters from the Hungarian–Romanian border. In the 1980s, during field surveys in the vicinity of Csanádpalota, numerous Late Bronze Age sites were identified in the area of the – then unknown – fortified settlement.[34] Later research revealed that all these separate sites were part of a huge, 460-hectare-large fortified settlement. At most sites, the Late Bronze Age component was mixed with medieval material, although a few yielded only Late Bronze Age sherds. The central, oval enclosure of the settlement was identified during survey as a 600×250 m large, N–S oriented ridge, with a 200×100 m large oval depression in its centre.[35]

During the mid-2000s, field surveys were carried out here along the planned track of the M43 motorway. The track passed through the external part of the large fortified site to be identified only subsequently and was named Site no. 55 Juhász T.-tanya[36] *(fig. 1).* During the excavations that were launched in 2011, when using the satellite images of Google Earth to follow the traces of a large ditch discovered in the western part of the excavated area (Feature 23), the outlines of an extremely large ditch system could be identified surrounding the already known oval enclosure *(fig. 2).* These images and our later field research demonstrated that a ca. 460-hectare-large fortified mega-site with multiple enclosures is located in the area.[37] During the excavation of the site between 2011 and 2013, ca. 12 hectars were unearthed in the area between the two external enclosures surrounding the settlement *(fig. 3)*. More than 100 features were excavated that yielded so-called Pre-Gáva (Cruceni–Belegiš II) material from the middle phase of the Late Bronze Age (ca. 1350–1100 BC). In the excavated area of the track of the motorway, pits, ditches and remains of a gate leading into the central area were unearthed. Most of the pits contained everyday remains, however, a few other pits seemed to contain special, structured depositions; these were mostly located near the above-mentioned gate. The unearthed ditch sections mostly belonged to the enclosures of the large ditch system (Enclosures 3 and 4).

After the excavation of the motorway track in 2011–2013, research on the mega-fort continued as part of a research project, using a number of different non-invasive methods and small-scale excavations in the central part of the site, within Enclosure 1.[38]

[33] The comparative analysis of the macrolithic finds from other contemporaneous sites from the region will be carried out in a future work.

[34] *Szathmári 1984.*

[35] *Szathmári 1984* 14.

[36] *Szalontai 2006.*

[37] *Czukor et al. 2013; Priskin et al. 2013.*

[38] *Szeverényi et al. 2021; Szeverényi et al. 2022* in this volume.

Fig. 1. Aerial photo of the central enclosure of Csanádpalota-Földvár (©Pazirik Kft.)

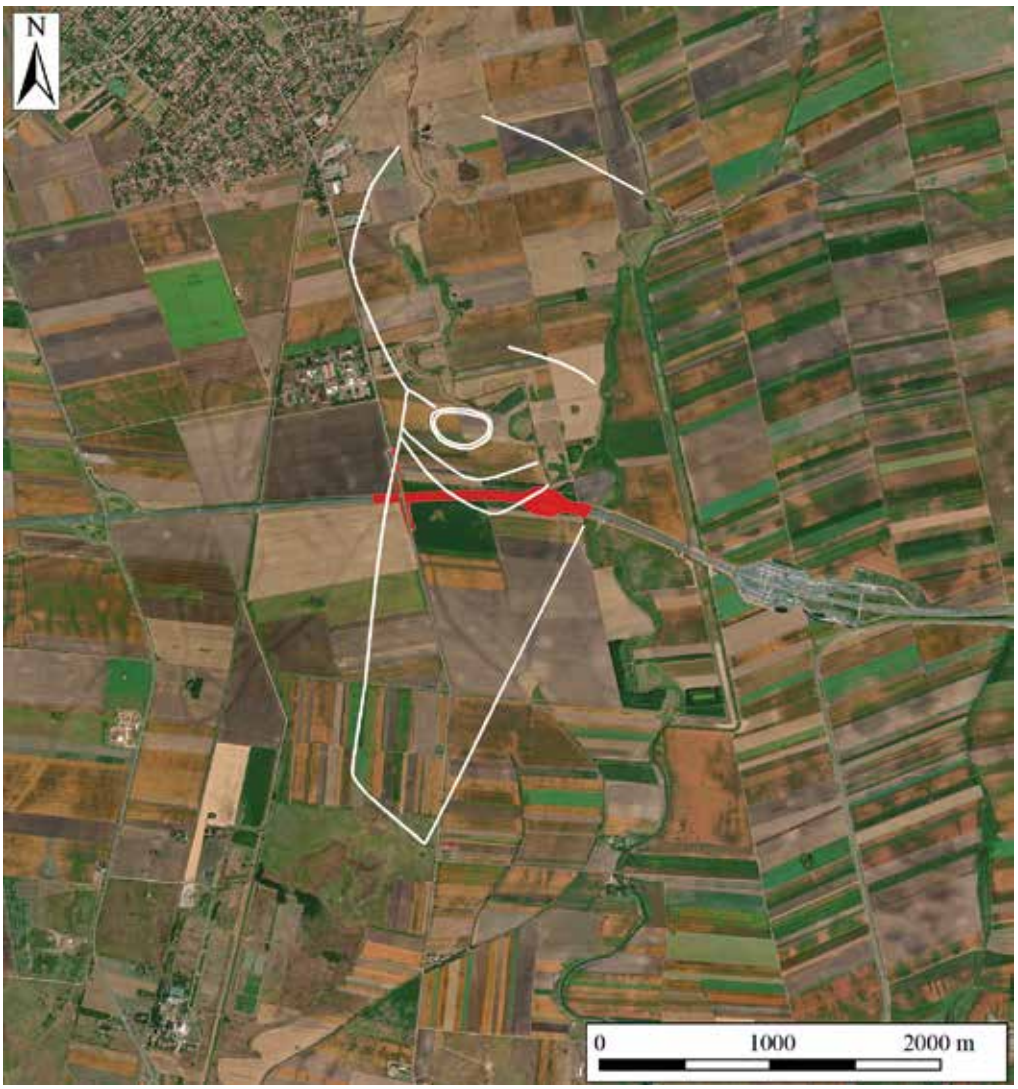

Fig. 2. The enclosures of Csanádpalota-Földvár with the excavated area in red (©Péter Czukor)

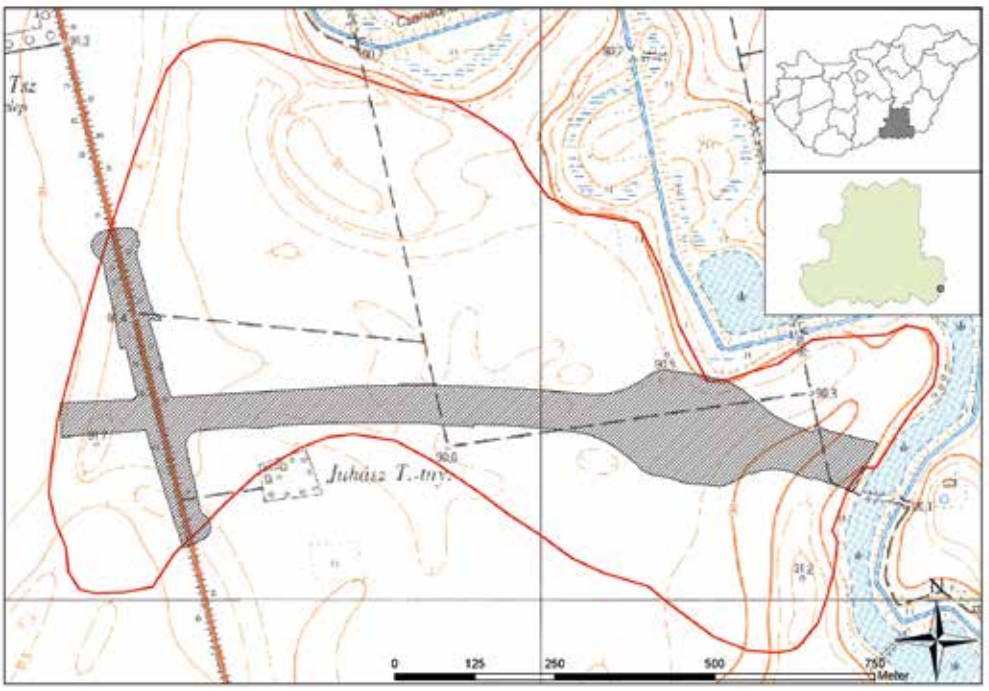

Fig. 3. Csanádpalota-Földvár excavated area in 2011 and 2013 (©Péter Czukor)

Macrolithic material

The lithic material under study comprises 238 pieces from 45 Late Bronze Age features: 32 pits and 13 ditches, of which four belong to the main enclosures. During the excavation – despite the circumstance characterising large-scale preventive excavations with regard to time and attention to detail – all lithic finds were collected and documented, and systematic soil sampling was also carried out from all datable features.

Results

The majority of the macrolithic finds are indeterminable lithic finds and raw material pieces (138 pieces), while the number of macrolithic tools is 100.

With regard to preservation, the following could be observed: 12 tools belong to Group 1 (intact), 12 tools belong to Group 2 (at least one-third preserved), while 76 belong to Group 3 (less than one-third preserved).

On the finds of Group 1 clear traces of manufacturing and/or use could be observed. Primarily small-sized tools remained intact: abraders (4), abrader/hammerstone (2), and hammerstone (1). It is interesting that the find material includes a single intact grinding slab and three handstones *(Diagram 1)*. The number of finds in Group 2 is also rather low, however, more tools types could be identified: abrader (2), abrader/hammerstone (3), sharpener (1), stone-slab (4), grinding slab (1), multifunctional tool (1) *(Diagram 2)*. The majority of the tools under study belong to Group 3, where less than one-third of the original size has been preserved *(Diagram 3)*. The number of grinding stones and stone slabs is large compared to that of the other tools.

Petrographic analysis

The analysis of the raw material of the macrolithic objects was carried out both macroscopically and microscopically, with thin section analysis on samples macroscopically determined as vulcanites. Based on macroscopic analyses, 9% of the ‘macrolithic’ objects turned out to be

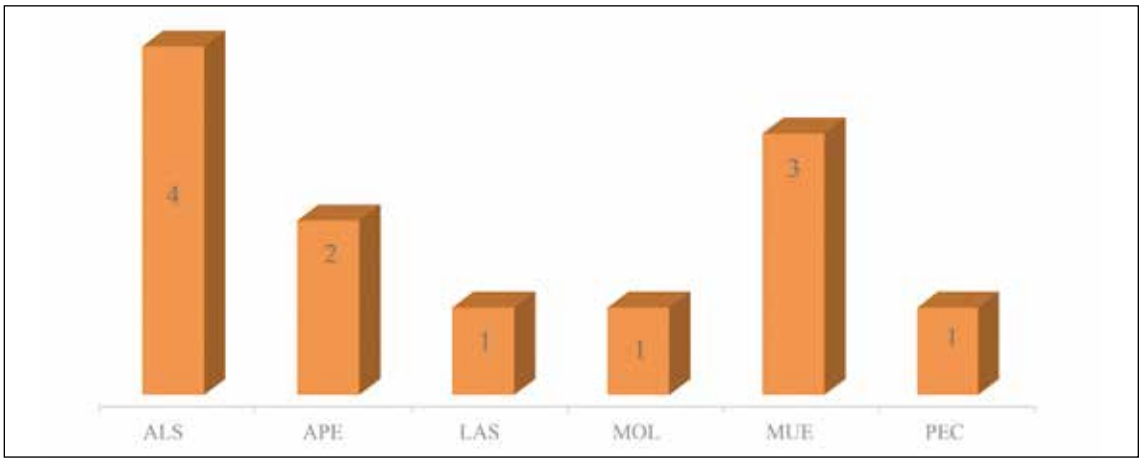

Diagram 1. Preservation of the macrolithic tools – Group 1 (n=12)

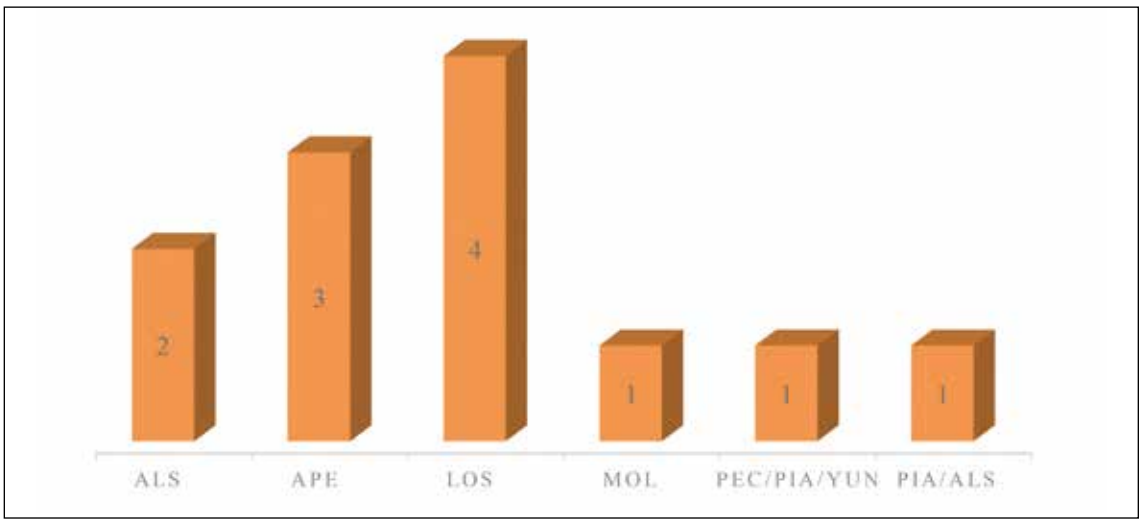

Diagram 2. Preservation of the macrolithic tools – Group 2 (n=12)

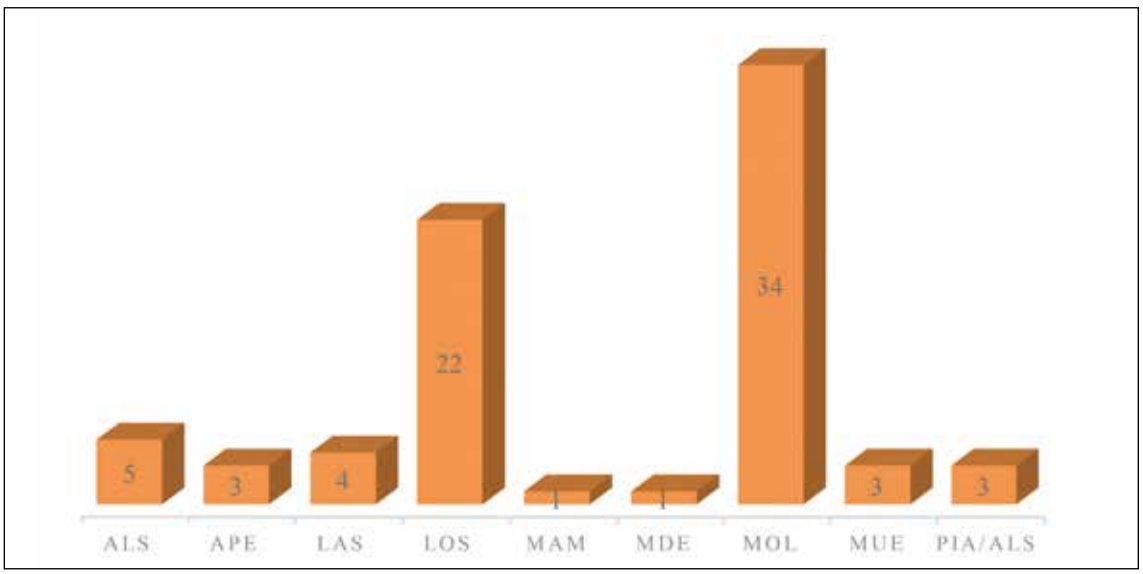

Diagram 3. Preservation of the macrolithic tools – Group 3 (n=76)

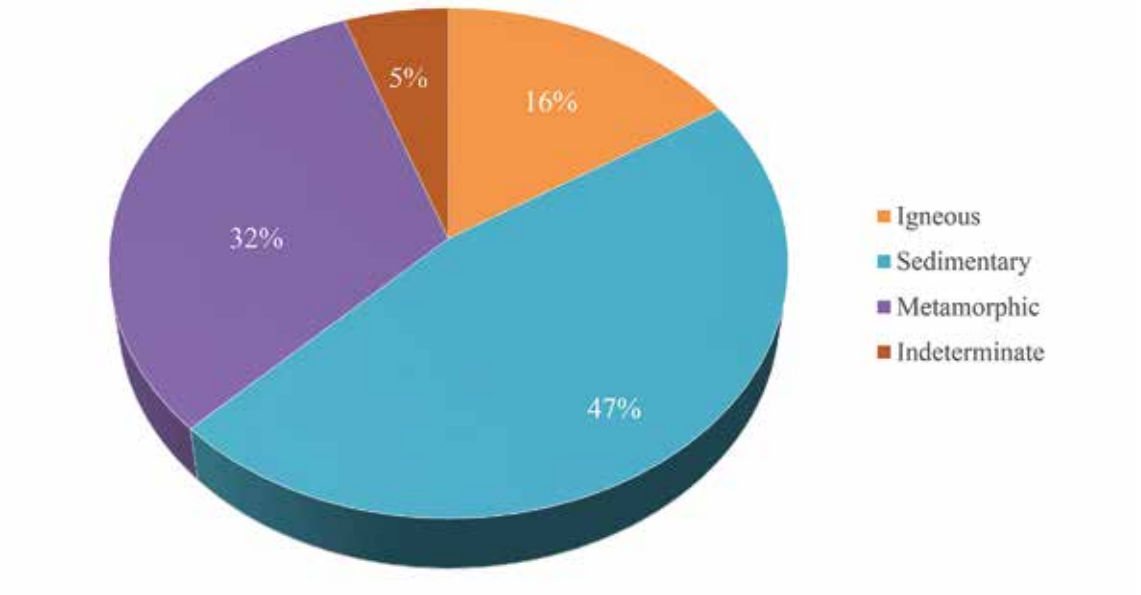

Diagram 4. Raw material of the macrolithic tool types (n=100)

artificial material (mostly plastering and daub) or carbonate concretion. The following percentage values are referring to the number of the remaining macrolithic objects. About 20% of the material is of gravel (pebble) origin. Gravels/pebbles were counted together with the corresponding raw materials, except quartzite-pebbles. The majority of the 238 pieces of the macrolithic finds (47%) was made of sandstone of various colours (grey, light grey, red) and sandstone pebbles; this was the most frequently used raw material at the site. Many of the identified tools (51 pieces) were also manufactured from this material: these were primarily grinding and pulverizing tools, less frequently abrading and percussing tools. Metamorphic rocks (32%) include raw materials such as quartzite, mica-schist and gneiss, which were often preserved in a very fragmented, crumbly state. With regard to tools, those made of quartzite is larger (12 pieces): this is the primary raw material of abrader-hammerstones (APE), but also includes a few grinding slabs (MOL), handstones (MUE), abraders (ALS) and stones slabs (LOS). Volcanic rock forms 16% of the whole material. In the case of tools, andesite is the most frequent (14 pieces), the other volcanic rocks (basalt, dacite, volcanic tuff) are represented by only one or two pieces in the material. With regard to tool types, it is evident that they were raw materials of grinding and pulverizing tools (grinding slab, handstone, stone slab). Because the raw material determination of most of the finds rely upon macroscopic characterization, it was impossible some cases due to the weathering of the finds *(Diagram 4)*.[39]

The source of the raw materials is assumed to be located in the Maros/Mureş valley (various types of sandstones, quartzite, quartzite pebbles, metadolerite), in the Apuseni Mountains (vulcanites, limestone, sandstone, granitoids), and the Southern Carpathians (mica-schist) all ca. 150-200 km away from the site.[40] The sources in the Upper Maros valley and the Apuseni Mountains were accessible via a route along the Maros river while those in the southern Carpathians could be reached following the Tisza, then the Danube rivers.

[39] *Péterdi – Sági – Priskin in print.*
[40] *Szakmány et al. 2009; Starnini et al. 2015.*

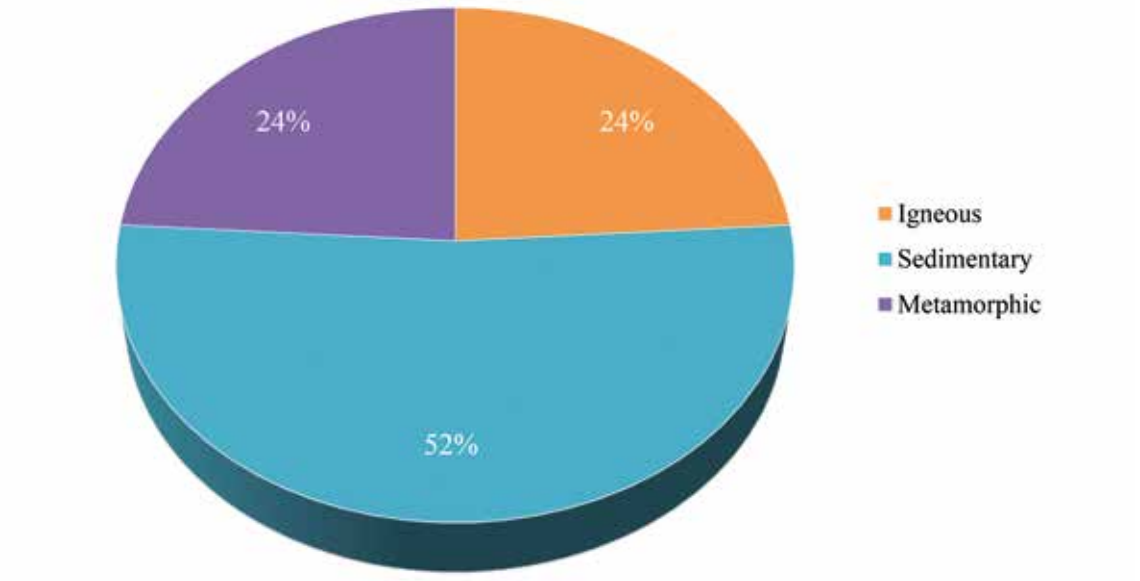

Diagram 5. Distribution of tool types – Functional group 1 (n=69)

Classification

Macrolithic tools are assigned through macroscopic formal analysis – typological classification – to one of the traditional stone tool types. This primary identification may be complemented – in some cases even changed – by data from morphometric, petrographic and use-wear analyses, based on which the tool types can be classified into so-called functional groups.[41]

There are 100 pieces of macrolithic tools in the studied material, most of which are fragments. Manufacture traces can be examined on intact specimens; however, their number is rather low in the examined material (12 pieces). The extent of transformation during the manufacture process is the greatest in the case of grinding slabs, handstones and moulds. In the case of tool fragments we can detect manufacturing traces on the remnants of the original surfaces (mostly the sides or edges).

The first functional group includes tools connected to food processing. These are grinding slabs, handstones and stone slabs. Grinding stones were primarily used in grinding, pulverizing and crushing of domestic and wild plants. Stone slabs were used for the processing of other materials, e.g. tempering materials for pottery, pigments, salt, etc. 68 tools from the material can be assigned to this group *(Diagram 5)*. With regard to the preservation of the tools, almost all of the 36 grinding slabs are fragments (Type 3), with the exception of a basalt grinding slab and another larger fragment where the front side was preserved. With regard to the raw material, pieces made of sandstone dominate in the material, although the ratio of vulcanite is the highest in this tool type. The intact piece is an oval grinding slab,[42] whose sides show clear manufacturing traces. In order to create the oval form, larger flakes were removed from the sides and edges. The front side displays the special traces of grinding: a used and renewed surface *(fig. 4. 1)*. The grinding slab, which has only its frontal side preserved, has a burnt work surface.[43] In the case of smaller grinding slab fragments, manufacturing traces on the preserved sides and a strongly worn surface could be observed. After the use of a tool as a grinding slab (e.g. due to fragmentation),

[41] *Risch 1995; Adams 2002; Vučković 2019.*
[42] Inv. no. MFM Ő.2012.16.5369 (Móra Ferenc Museum, Szeged).
[43] Inv. no. MFM Ő.2012.16.5144.

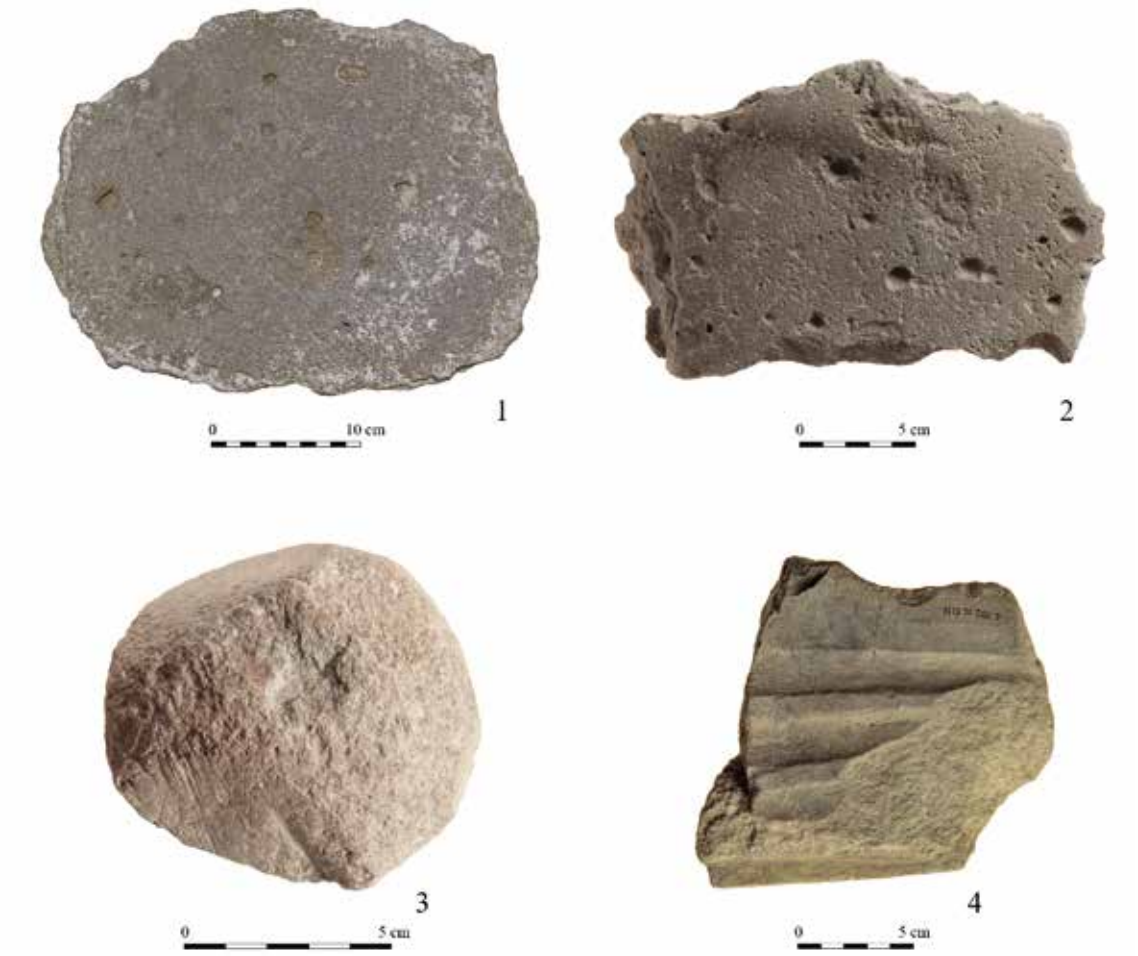

Fig. 4. 1. Complete grinding slab from ditch 440; 2. Complete handstone from pit 418; 3. Multifunctional tool from pit 267; 4. A pieces of mold from pit 348 (©Ákos Jurás)

pieces made of volcanic raw materials difficult to acquire were reused with a new function, e.g. as handstones.

The number of handstones or grinders compared to the size of the whole material and the number of grinding slabs is very low (6 pieces), but they include two intact specimens.[44] The small number of handstones might be explained by their secondary use, or by the use of wooden grinders. The intact pieces clearly show manufacturing traces, which, however, cannot be observed on the fragmentary ones. The intact handstones were manufactured from damaged grinding slabs *(fig. 4. 2)*. Most of the fragmentary pieces had strongly worn work surfaces.

With regard to the 26 pieces of stone slabs, none of them were intact, but in four cases at least two-thirds of the tools were preserved.[45] Manufacturing traces could be observed on only a single specimen.[46] The working surfaces of most of these tools were strongly worn and polished; on some of them it was possible to observe the renewal of the work surface.

Residue analysis has not yet been carried out on the grinding stones yet, we do have, however, good botanical data from all the contexts with macrolithic tools thanks to the systematic sample collection strategy.

[44] Inv. nos. MFM Ő.2012.16.5135, MFM Ő.2012.16.5159.
[45] Inv. nos. MFM Ő.2012.16.5047, MFM Ő.2012.16.5051, MFM Ő.2012.16.5129, MFM Ő.2012.16.5371.2.
[46] Inv. no. MFM Ő.2012.16.5129.

The next category includes tools used for abrasion and sharpening. These tools removed materials from the surface of the contact material. As a result, different use-wear traces were created on the working surfaces of the tools (striation, grooves). The intension of these special use-wear traces and the damage of the tool depends on the nature of the contact surfaces.[47]

The material includes 11 abraders (ALS) and five sharpener/abraders (ALS/PIA), of which four abraders[48] and one abrader/sharpener[49] were intact, the other were fragments belonging to Group 3. In the case of both types it could be established that the working surface could be formed on any sides and edges, and their morphology is convex. The fragmented working surfaces of the sharpener/abrader are fine-grained and polished. With regard to raw materials, abraders were made of sandstone, quartzite and micaschist, while all of the sharpener/abraders were made of sandstone.

Another functional group includes percussion tools, which have two or more active working surfaces, mostly on the edges of the tools. They are used to remove superfluous material from a surface, or transform and renew surfaces, such as the working surface of a grinding slab. During use, fatigue wear appears, but the nature of the damage on the contact surface – which can be broad and shallow or narrow and sharp – is determined by the shape of the working surface of the percussion tool and the force of the blow.[50] In the Csanádpalota material, nine percussion tools could be identified, a complete hammerstone[51] and eight abrader/hammerstones, of which two pieces were intact.[52]

There is a multifunctional tool[53] presenting three different working traces with different functions. Based on the preservation and fragmentation of the use-wear traces it can be reconstructed, how the various functions came after one another. The tool is fragmentary and its ventral surface is missing; however, on the dorsal surface narrow grooves parallel with each other and a wider and deeper channel besides them are clearly visible. The working surface between the grooves is strongly polished, thus the sharpener function was probably predated by an abrading/polishing function. On the preserved sides of the fragment, traces of use as a hammerstone can be identified, which are cut through by the breakage surface, thus this function must predate the breakage of the tool. After its breakage, the orientation of the fragment changed, thanks to the direction of the breakage its previous side became its dorsal surface with anvil function, indicated by traces on the dorsal side created by strong downward pressure *(fig. 4. 3)*. Thus, the tool was a multifunctional abrader/sharpener-abrader/hammerstone-anvil (ALS/PIA-APE-YUN).

A mould fragment and a mace fragment belongs to the functional group of paraphernalia. We can assume the mould function of the fragment based on the shaping of its surface. Its dorsal surface and (lower) sides are hollowed, and two shallow, parallel grooves run on its ventral side. No use-wear traces (e.g. burning) can be seen on the surface, thus it is possible that it was damaged after its construction, and never fulfilled its function *(fig. 4. 4)*.

The lithic assemblage also contains a few flakes removed during the manufacture of the tools (5 pieces).

Contextual analysis

No buildings were found in the unearthed area; most of the excavated features are pits dug into the subsoil, which – based on their materials – were probably used as rubbish pits. Four large

[47] *Adams 2002* 77.
[48] Inv. nos. MFM Ő.2012.16.5046, MFM Ő.2012.16.5050, MFM Ő.2012.16.5193, MFM Ő.2012.16.5194.
[49] Inv. no. MFM Ő.2012.16.5146.1.
[50] *Adams 2002* 151.
[51] Inv. no. MFM Ő.2012.16.5114.
[52] Inv. nos. MFM Ő.2012.16.5146, MFM Ő.2012.16.5128.
[53] Inv. no. MFM Ő.2012.16.5347.

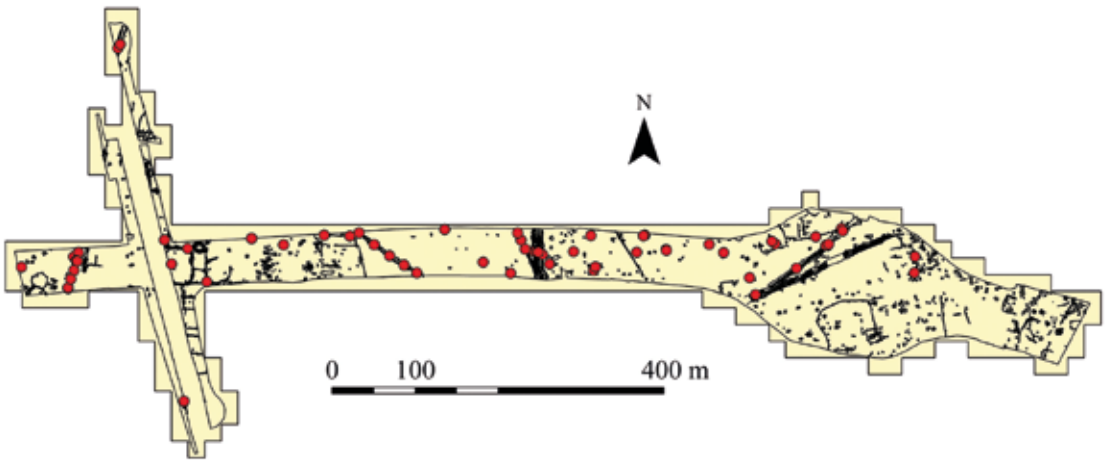

Fig. 5. Csanádpalota-Földvár LBA features with macrolithic materials (©Péter Czukor)

postholes were also excavated, which were part of a wooden gate structure, through which people could enter the internal area of the fortified settlement. In the area surrounding the gate, a few pits with special finds and structure were found, where traces of intentional, structured depositions could be identified. Within the settlement, a few smaller ditches were also observed; these could have had some form of spatial dividing function. 32 pits and ten ditches (four main enclosures and six smaller ditches) contained macrolithic finds *(fig. 5)*.

Of the 138 investigated pieces of lithic materials and undeterminable lithic finds, 60% came from the enclosures, 35% from pits and 5% from smaller ditches. The ratio of the context of the 100 pieces of macrolithic tools is the following: 47% from enclosures, 39% from pits, 10% from smaller ditches and 4% from pits with structured depositions. The ratio of the various tools in the given settlement feature types is varied.

The enclosures yielded 47 pieces of macrolithic tools, 76% of which is very fragmentary. They also contained 11 pieces of complete or nearly complete grinding stones, abraders, stone slabs, a sharpener/abrader, and an abrader/hammerstone. The largest number of tools was found in Ditch 23, however, the only complete grinding slab from the site was discovered in Ditch 440. The already mentioned postholes of a gate leading to the settlement were also found along this enclosure. The section of the ditch in the vicinity of the gate yielded a number of special objects, such as bronze pins and their fragments, the already mentioned grinding slab and an intact handstone (both made of the same andesite raw material). The placement of these objects into this section of the enclosure must have been the result of deliberate deposition, perhaps some kind of a ritual activity. Based on the extent of fragmentation and use-wear, tools in other ditch segments can probably be interpreted as discarded waste.

Macrolithic finds were found in six of the smaller ditches within the settlement, of which 10 were identifiable tools (grinding slabs, abrader and stone slabs), all of which were fragmentary. It may be suggested that these smaller ditches had an internal dividing function, or were fens, and the macrolithic tool fragments were discarded waste here as well.

32 pits yielded 43 pieces of macrolithic tools. Beside the storage and rubbish pits, three pits with special material were also excavated (Features 44, 439 and 474), where objects (e.g. bronze objects, knives, bone tools, pottery and macrolithic tools) had been deposited in numerous layers. The lithic material (27 pieces) from pits is very fragmentary, the number of complete or nearly complete specimens is 12. Two abrader/hammerstones were found in Pit 439. The most frequent tool types from pits were grinding slabs (13 pieces), stone slabs (9 pieces), and the multifunctional

abrader/hammerstones (6 pieces). The few unique pieces of the macrolithic material were all found in pits, e.g. the only real multifunctional tool of the lithic material from Feature 267, the hammerstone from Feature 342, and the mould from Feature 348.

Conclusions

Although the analysis of the macrolithic remains from Csanádpalota and other contemporary sites is still ongoing, we might be able to draw some preliminary conclusions based on the already available data and analytical results.

The extent of fragmentation observed at the site indicates the long-term use of macrolithic tools. These implements were used and reused even after breakage, sometimes with a change of function, until they became so fragmentary as not to be able to be used any more. This indicates, on the one hand, perhaps limited access to the sources of raw materials, which forced the community to make use of the already available tools as long as possible. On the other hand, it also indicates continuous domestic activities, thus continuous, longer term habitation at a site, whose function might not be as straightforward.[54]

If we return to the questions and hypotheses posed at the beginning of this paper regarding the social and economic structure of the polity under study, it is important to highlight that tools for food production and processing are not very abundant at the site. Their number is not very high and they are not concentrated spatially either. This does not indicate central control over food processing, contradicting the hypothesis of chiefs relying on staple finance and control over subsistence. Nevertheless, the excavated area is limited and is not located in the central part of the site, thus this picture might change with further excavations.

With regard to feasting (as a form of redistribution), it seems to be present, as indicated by large pits with structured depositions, which also contained macrolithic tools used for food processing. However, tools for food processing do not appear in large numbers, and the abrader/hammerstone tool type (APE) is the most frequent in these features.

Although no proper comparative material exists from the region and the period yet, it is my general impression that the type spectrum of tools is somewhat limited. Grinding implements and abraders and stone slabs used for the manipulation of softer materials are present, but there are hardly any tools for metallurgy, pottery manufacture, and many other economic activities. Here again the question must be raised that since the excavation was limited in comparison to the huge size of the site, we do not know if this indicates the lack of such activities, or the lack of such activities in this particular part of the settlement. If they are in fact lacking totally, that contradicts the theory of a central place, the residence of chiefs, who control specialized activities and crafts.

To sum up, at the current state of research, the analysis of macrolithic tools does not support the interpretation of the Csanádpalota ‘mega-fort’ as a chiefly centre of a regional polity, from where political leaders controlled the subsistence economy and specialised crafts to maintain their power. I hope to have been able to demonstrate the usefulness of the macrolithic implements to answer – at least partly – socio-economic questions about prehistoric. The study of macrolithic implements from Late Bronze Age settlements from Southeastern Hungary is ongoing, and through the comparative analysis of other sites from the region in the future we will hopefully gain a better understanding of prehistoric economy and society in the Great Pannonian Plain.

[54] See *Szeverényi et al. 2014.*

REFERENCES

Adams 2002 J. L. Adams: Ground Stone Analysis. A Technological Approach. Salt Lake City 2002.

Adams 2008 J. L. Adams: Beyond the broken, in: Y. M. Rowan – J. R. Ebeling (eds.): New Approaches to Old Stones. Recent Studies of Ground Stone Artifacts. London 2008, 213–229.

Adams et al. 2009 J. L. Adams – S. Delgado – L. Dubreuil – C. Hamon – H. Plisson – R. Risch: Functional analysis of macro-lithic artefacts. A focus on working surfaces, in: F. Strenke – L. Eigeland – L.-J. Costa (eds.): Non-flint Raw Material Use in Prehistory. Old Prejudices and New Directions. Oxford 2009, 43–66.

T. Biró 1995 K. T. Biró: Lithic implements of Gór, NW Hungary. Evidences of stone casting moulds production. Preliminary results, in: Y. Maniatis – N. Herz – Y. Basiakos (eds.): The Study of Marble and Other Stones Used in Antiquity. Asmosia Third International Conference Volume. London 1995, 51–56.

T. Biró 1996 K. T. Biró: Késő bronzkori kőeszközök Németbánya határából (Late Bronze Age stone tools from the environs of Németbánya). ActaMusPapensis 6 (1996) 219–234.

Blanton et al. 1996 R. E. Blanton – G. M. Feinman – S. A. Kowalewski – P. N. Peregrine: A dual-processual theory for the evolution of Mesoamerican civilization. CurrAnt 37/1 (1996) 1–14.
https://doi.org/10.1086/204471

Bofill 2012 M. Bofill: Quantitative analysis of use-wear patterns. A functional approach to study grinding stone tools, in: F. Borrell Tena – M. Bouso García – A. Gómez Bach – C. Tornero Dacasa – O. Vicente Campos (eds.): Broadening Horizons. 3. Conference of Young Researchers Working in the Ancient Near East. Bellaterra 2012, 63–84.

Bofill et al. 2013 M. Bofill – H. Procopiu – R. Vargilou – H. Zahouani: Use-wear analysis of Near Eastern Prehistoric grinding stones, in: P. Anderson – C. Cheval – A. Durand (eds.): Regards croisés sur le outils liés au travail des végétaux. Antibes 2013, 225–242.

Brück – Fontijn 2013 J. Brück – D. Fontijn: The myth of the chief. Prestige goods, power and personhood in the European Bronze Age, in: H. Fokkens – A. Harding (eds.): The Oxford Handbook of the European Bronze Age. Oxford 2013, 197.
https://doi.org/10.1093/oxfordhb/9780199572861.013.0011

Carneiro 1981 R. Carneiro: The chiefdom. Precursor of the state, in: J. Grant – R. R. Kautz (eds.): The Transition to Statehood in the New World. Cambridge 1981, 37–79.

Czukor et al. 2013 P. Czukor – A. Priskin – Cs. Szalontai – V. Szeverényi: Zárt terek, nyitott határok. Késő bronzkori földvárrendszer a Dél-Alföldön [Closed spaces, open borders. Late Bronze Age fortified settlement system in the Southern Hungarian Plain]. VKT 9/1 (2013) 12–15.

D'Altroy et al. 1985 T. N. D'Altroy – T. K. Earle – D. L. Browman – D. La Lone – M. E. Moseley – J. V. Murra – T. P. Myers – F. Salomon – K. J. Schreiber – J. R. Topic: Staple finance, wealth finance, and storage in the Inka political economy. CurrAnt 26/2 (1985) 187–206. https://doi.org/10.1086/203249

Delgado-Raack 2008 S. Delgado-Raack: Prácticas económicas y gestión social de recursos (macro)líticos en la prehistoria reciente (III–I milenios ac) del Mediterráneo occidental. PhD thesis, Universitat Autònoma de Barcelona, Departament de Prehistória. Barcelona 2008.

Delgado-Raack – Gómez-Gras – Risch 2009 S. Delgado-Raack – D. Gómez-Gras – R. Risch: The mechanical properties of macrolithic artifacts. A methodological background for functional analysis. JAS 36/9 (2009) 1823–1831. https://doi.org/10.1016/j.jas.2009.03.033

Delgado-Raack – Risch 2009 S. Delgado-Raack – R. Risch: Towards a systematic analysis of grain processing technologies, in: M. de Araujo Igreja – I. Clemente Conte (eds.): Proceedings of the Workshop. Recent Functional Studies on Non-flint Stone Tools. Methodological Improvements and Archaeological Inferences, 23–25 May 2008, Lisboa. Lisbon 2009, 1–20.

Delgado-Raack et al. 2020 S. Delgado-Raack – J. Kneisel – J. Czebreszuk – J. Müller: Manufacture, use and management of macro-lithic resources in the Bronze Age settlement of Bruszczewo (Poland). Lithic Studies 7/3 (2020) 1–26. https://doi.org/10.2218/jls.3080

Dietler 1990 M. Dietler: Driven by drink. The role of drinking in the political economy and the case of Early Iron Age France. JAA 9/4 (1990) 352–406. https://doi.org/10.1016/0278-4165(90)90011-2

Dietler 1996 M. Dietler: Feasts and commensal politics in the political economy. Food, power and status in Prehistoric Europe, in: P. Wiessner – W. Schiefenhövel (eds.): Food and the Status Quest. Providence 1996, 87–12.

Dietler 2001 M. Dietler: Theorizing the feast. Rituals of consumption, commensal, politics and power in African contexts, in: M. Dietler – B. Hayden (eds.): Feasts. Archaeological and Ethnographic Perspectives on Food, Politics and Power. Smithsonian Series in Archaeological Inquiry. Washigton – London 2001, 65–114.

Dubreuil – Savage 2013 L. Dubreuil – D. Savage: Ground stones. A synthesis of the use-wear approach. JAS 48 (2013) 139–153. https://doi.org/10.1016/j.jas.2013.06.023

Earle 1987 T. K. Earle: Chiefdoms in archaeological and ethnohistorical perspectives. Annual Review of Anthropology 16 (1987) 279–308. https://doi.org/10.1146/annurev.an.16.100187.001431

Earle 1991 T. K. Earle: The evolution of chiefdoms, in: T. Earle (ed.): Chiefdoms. Economy, Power and Ideology. Cambridge 1991, 1–15.

Earle 1997 T. K. Earle: How Chiefs Come to Power. The Political Economy in Prehistory. Stanford 1997. https://doi.org/10.1515/9781503616349

Ehrenreich – Crumley – Levy 1995 R. M. Ehrenreich – C. L. Crumley – J. E. Levy (eds.): Heterarchy and the analysis of complex societies. Archaeological Papers of the American Anthropological Association 6/1 (1995) 1–5. https://doi.org/10.1525/ap3a.1995.6.1.1

Feinman 1995 G. Feinman: The emergence of inequality. A focus on strategies and processes, in: T. D. Price – G. Feinman (eds.): Foundations of Social Inequality. New York – London 1995, 255–279. https://doi.org/10.1007/978-1-4899-1289-3_10

Feinman 2001 G. Feinman: Mesoamerican political complexity. The corporate-network dimension, in: J. Haas (ed.): From Leaders to Rulers. New York 2001, 151–175. https://doi.org/10.1007/978-1-4615-1297-4_8

Gilman et al. 1981 A. Gilman – R. McC. Adams – A. M. Bietti Sestieri – A. Cazzella – H. J. M. Claessen – G. L. Cowgill – C. L. Crumley – T. Earle – A. Gallay – A. F. Harding – R. J. Harrison – R. Hicks – P. L. Kohl – J. Lewthwaite – C. A. Schwartz – S. J. Shennan – A. Sherratt – M. Tosi – P. S. Wells: The development of social stratification in Bronze Age Europe. CurrAnt 22/1 (1981) 1–23. https://doi.org/10.1086/202600

Hayden 1996 B. Hayden: Feasting in Prehistoric and traditional societies, in: P. Wiessner – W. Schiefenhövel (eds.): Food and the Status Quest. An Interdisciplinary Perspective. The Anthropology of Food and Nutrition 1. Oxford 1996, 127–147.

Hayden 2001 B. Hayden: Fabulous feasts. A prolegomenon to the importance of feasting, in: M. Dietler – B. Hayden (eds.): Feasts. Archaeological and Ethnographic Perspectives on Food, Politics and Power. Smithsonian Series in Archaeological Inquiry. Washington – London 2001, 3–64.

Horváth 2000 T. Horváth: Az őrlés folyamata és szerszámai az őskor időszakában Magyarországon (Prehistoric grinding tools and grinding technology in Hungary), in: G. Ilon (ed.): Válogatás a Berzsenyi Dániel Főiskola régésztechnikusainak és a József Attila Tudományegyetem régész hallgatóinak tanulmányaiból. Panniculus Ser. B. 5. Szombathely 2000, 101–143.

Horváth 2004 T. Horváth: A vatyai kultúra településeinek kőanyaga. Komplex régészeti és petrográfiai feldolgozás (Stone tools from settlements of Vatya culture [MBA]. Complex archaeological and petrographical analysis). PhD thesis at the Eötvös Loránd University, Budapest. Budapest 2004.

Horváth 2005 T. Horváth: Stone finds from excavation seasons 1998, 1999 and 2000. Typological and technical analysis. Annual Report of Százhalombatta Archaeological Excavation 2 (2005) 135–157.

Horváth – Kozák – Pető 1999 T. Horváth – M. Kozák – A. Pető: Bölcske-Vörösgyír bronzkori tell település kőanyagának komplex (petrográfiai, régészeti) feldolgozása [Complex analysis of the stone finds from Bölcske-Vörösgyír Middle Bronze Age tell-settlement]. WMMÉ 21 (1999) 61–107.

Horváth – Kozák – Pető 2000a T. Horváth – M. Kozák – A. Pető: Újabb adatok a középső bronzkor kőiparához. Bölcske-Vörösgyír tell-település kőanyagának komplex feldolgozása (Neue Angaben über die Steinverarbeitung in der mittleren Bronzezeit. Die Aufarbeitung des Komplexes des Steinmaterials der bronzezeitlichen Hügelsiedlung von Bölcske-Vörösgyir [petrographisch-archäologisch]). KMK 7 (2000) 187–235.

Horváth – Kozák – Pető 2000b T. Horváth – M. Kozák – A. Pető: The stone tools of Százhalombatta-Sánchegy. Annual Report of Százhalombatta Archaeological Excavation 1 (2000) 69–76.

Horváth et al. 2016 T. Horváth – A. Farkas-Pető – I. Farkas – J. Mihály – B. Péterdi: Füzesabony-Öregdomb bronzkori tell-település kőanyaga (Stone material of the bronze age tell settlement of Füzesabony-Öregdomb). Agria 49 (2016) 29–94.

Kienlin 2012 T. Kienlin: Beyond elites. An introduction, in: T. Kienlin – A. Zimmermann (eds.): Beyond Elites. Alternatives to Hierarchical Systems in Modelling Social Formations. Bonn 2012, 15–32.

Kristiansen 1991 K. Kristiansen: Chiefdoms, states, and systems of social evolution, in: T. Earle (ed.): Chiefdoms. Economy, Power and Ideology. Cambridge 1991, 16–43.

Kristiansen 1998 K. Kristiansen: Europe before History. Cambridge 1998.

Lull et al. 2010 V. Lull – R. Micó – C. Rihuete Herrada – R. Risch: The economic and political relations of El Argar. Menga 1 (2010) 212–224.

Lull et al. 2011 V. Lull – R. Micó – C. Rihuete Herrada – R. Risch: El Argar and the beginning of class society in the western Mediterranean. Archäologie in Eurasien 24 (2011) 381–414.

Lull et al. 2013 V. Lull – R. Micó – C. Rihuete Herrada – R. Risch: Political collapse and social change at the end of El Argar, in: H. Meller – F. Bertemes – H.-R. Bork – R. Risch (eds.): 1600 – Cultural Change in the Shadow of the Thera Eruption? Tagungen des Landesmuseums für Vorgeschichte Halle 9. Halle (Saale) 2013, 283–303.

Meller 2019 H. Meller: Princes, armies, sanctuaries. The emergence of complex authority in the Central German Únětice Culture. ActaArch 90/1 (2019) 39–79.
https://doi.org/10.1111/j.1600-0390.2019.12206.x

Pauketat 2007 T. R. Pauketat: Chiefdoms and other Archaeological Delusions. Eastern Woodlands Archaeology. Lanham 2007.

Péterdi – Sági – Priskin in print B. Péterdi – T. Sági – A. Priskin: Csanádpalota-Földvár késő bronzkori lelőhely kőzetanyagú leleteinek archeometriai vizsgálata. Előzetes eredmények [Archaeometrical analysis of macrolithic tools from Csanádpalota-Földvár Late Bronze Age settlements. Preliminary results]. In print.

Priskin et al. 2013 A. Priskin – P. Czukor – Cs. Szalontai – V. Szeverényi: Research into the structure of Late Bronze Age settlements in the Southern Great Hungarian Plain. 'Enclosed Space – Open Borders' Project. HungArch 2/3 (2013) 1–6. http://files.archaeolingua.hu/2013O/Upload/cikk_Priskin_EN.pdf

Risch 1995 R. Risch: Recursos naturales, medios de producción y explotación social. Madrid 1995.

Risch 2008 R. Risch: From production traces to social organization. Towards an epistemology of functional analysis, in: L. Longo – N. Skakun (eds.): 'Prehistoric technology' 40 years later. Functional Studies and the Russian Legacy. Verona 2008, 519–527.

Service 1962 E. Service: Primitive Social Organization. An Evolutionary Perspective. New York 1962.

Starnini et al. 2015 E. Starnini – Gy. Szakmány – S. Józsa – Zs. Kasztovszky – V. Szilágyi – B. Maróti – B. Voytek – F. Horváth: Lithics from the tell site Hódmezővásárhely-Gorzsa (Southeast Hungary). Typology, technology, use and raw material strategies during the Late Neolithic (Tisza Culture), in: S. Hansen (ed.): Neolithic and Copper Age between the Carpathians and the Aegean Sea. Chronologies and Technologies from the 6th to the 4th Millenium BCE. International Workshop Budapest 2012. Archäologie in Eurasien 31. Bonn 2015, 105–128.

Szakmány et al. 2009 Gy. Szakmány – E. Starnini – F. Horváth – V. Szilágyi – Zs. Kasztovszky: Investigating trade and exchange patterns during the Late Neolithic. First results of the archaeometric analyses of the raw materials for the polished and ground stone tools from Tell Gorzsa (Southeast Hungary), in: G. Ilon (ed.): ΜΩΜΟΣ 6. Őskoros Kutatók VI. Összejövetelének konferenciakötete. Nyersanyagok és kereskedelem, Kőszeg, 2009. március 19–21. Szombathely 2009, 369–383.

Szalontai 2006 Cs. Szalontai: Csanádpalota határa [Vicinity of Csanádpalota], in: J. Kisfaludy (ed.): Régészeti kutatások Magyarországon 2005 (Archaeological Investigations in Hungary 2005). Budapest 2006, 220–222.

Szathmári 1984 I. Szathmári: Csanádpalota határának régészeti topográfiája [Archaeological topography of Csanádpalota]. MA thesis at the József Attila University, Szeged. Szeged 1984.

Szeverényi – Priskin – Czukor 2014 V. Szeverényi – A. Priskin – P. Czukor: Csanádpalota-Juhász T. tanya (M43 55. lh.) késő bronzkori erődített település feltárása. Előzetes jelentés a 2011–2013. évi ásatások eredményeiről (Excavations at the Late Bronze Age fortified settlement of Csanádpalota-Juhász T. tanya [M43 Site Nr. 55]. The results of the 2011–2013 campaigns). MFMÉ ÚF 1 (2014) 29–54.

Szeverényi et al. 2015 V. Szeverényi – A. Priskin – P. Czukor – A. Torma – A. Tóth: Subsistence, settlement and society in the Late Bronze Age of Southeast Hungary. A case study of the fortified settlement at Csanádpalota, in: J. Kneisel – W. Kirleis – M. Dal Corso – H. Scholz – N. Taylor – V. Tiedtke (eds.): The Third Food Revolution? Setting the Bronze Age Table. Common Trends in Economic and Subsistence Strategies in Bronze Age Europe. Proceedings of the International Workshop 'Socio-Environmental Dynamics over the Last 12 000 Years. The Creation of Landscapes III' (15th–18th April 2013) in Kiel. UPA 283. Bonn 2015, 275–287.

Szeverényi et al. 2021 V. Szeverényi – A. Priskin – P. Czukor – Cs. Szalontai: Settlement, economy and society in the Late Bronze Age in Eastern Hungary. The launch of a new project. HungArch 2021/4, 58–65.

Szeverényi et al. 2022 V. Szeverényi – P. Czukor – A. Priskin – Cs. Szalontai: Csanádpalota-Földvár. A Late Bronze Age 'Megafort' in southeastern Hungary. Antaeus 38 (2022) 213–249.

Tsoraki 2007 C. Tsoraki: Unravelling ground life histories. The spatial organization of stone tools and human activities at LN Makriyalos, Greece. DocPraehist 34 (2007) 289–297.
https://doi.org/10.4312/dp.34.22

Vučković 2019 V. Vučković: Neolithic Economy and Macro-lithic Tools of the Central Balkans. PhD thesis at the Universitat Autonòma de Barcelona, Departament de Prehistória. Bellaterra 2019.

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