

SANTÆUS ANTÆUS

38



# ANTÆUS

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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 Timișoara (Timișoara)
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 și Materiale. Muzeul Județean Tîrgu Mureș (Tîrgu Mureș)
MatArchSlov	Materialia Archaeologica Slovaca (Nitra)
MCA	Materiale și Cercetări Archeologice (București)
Menga	Menga. Revista de preistoria de Andalucia. Journal of Andalusian Prehistory (Antequera)
MFME	A Móra Ferenc Múzeum Évkönyve (Szeged)
MFME 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	Nartamongæ. The Journal of Alano-Osetic 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	Præhistorische 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 și comunicări. Seria Arheologie (Satu Mare)
Savaria	Savaria (Szombathely)
SbČSA	Sborník Československé Společnosti Archeologické (Brno)
SCIV	Studii și Cercetări de Istorie Veche (București)
SIA	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 Comitatus (Budapest)
SzIKMK	A Szent István Király Múzeum Közleményei (Székesfehérvár)
Terra Sebus	Terra Sebus. Acta Musei Sabesiensis (Sebes)
Tisicum	Tisicum. A Jász-Nagykún-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.

GÁBOR ILON

## CASTING MOULDS IN THE BRONZE AGE OF THE CARPATHIAN BASIN A CATALOGUE OF SITES AND FINDS

*In memoriam Tibor Kovács (1940–2013)*

**Zusammenfassung:** Die aus Stein oder Ton gefertigten Gussformen sind wichtige Beweise lokaler Metallurgie und entsprechender Fachleute. Vorliegende Studie lokalisiert die verschiedenartigen bronzzeitlichen Zentren der Metallverarbeitung im Karpatenbecken anhand der Verbreitung dieser Formen. Ergebnisse hinsichtlich der frühen, mittleren und späten Bronzezeit werden mithilfe von Landkarten und Tabellen erläutert. Ziel des Verfassers ist, unter Anwendung einheitlicher Prüfkriterien eine angemessene Grundlage für weitere internationale archäometrische Forschungen zu schaffen.

**Keywords:** casting moulds, metalworking, metalsmiths, workshops, Bronze Age, Carpathian Basin

Research today differs between independent specialists in each phase of metal processing, from mining to metalsmithing.<sup>1</sup> Casting moulds were most probably made by metalsmiths themselves, that is, the same craftspeople who used them. Single-use casting moulds made from sand or clay and reusable ones made from stone, a special kind of ceramic material resembling stone, or, rarely, bronze, are crucial evidence of the presence of local metalworking (and the related specialists), thus providing substantial information for Bronze Age archaeology.<sup>2</sup>

### *Bronze Age casting moulds from Hungary – a personal view*

I started to attend the excavations at Velem-Szent Vid back in the 1970s, still a high school student. It was the first time for me there to have a casting mould in my hands, and, later on, on a second occasion during a visit to the Miske Collection of the Savaria Museum. The significance of these finds became revealed to me through field stories by the archaeologists who led the excavation, Gábor Bándi and Mária Fekete, and their guests: István Bóna, Géza Komoróczy, and Gábor Vékony. The first stone mould I ever found came to light in 1985 from Grave 6 in an Árpadian-period cemetery at Mezölak-Szentpéteri-domb (*Table 3. 55*), one of my own excavations.<sup>3</sup> This specimen was made in the Late Bronze Age to cast a single socketed bronze axe; it later became transformed into a core piece and, finally, used perhaps as a whetstone during the Árpadian period. I also found, during the summer of 1986, a (maybe dolomite-tempered) clay mould for casting perhaps loops

<sup>1</sup> *Jockenhövel 1986 215, Abb. 3; Jockenhövel 2018 314; Sperling 2019 162, 165, Abb. 3–4, 9, Table 1–2; Molloy – Mödlinger 2020 176.*

<sup>2</sup> *Gazdapusztai 1959; Bóna 1960; Bóna 1975; Ecsedy 1982; Ecsedy 1995; Kovács 1995; Nessel 2019 163–165; Molnár et al. 2021 14.*

<sup>3</sup> *Ilon 1989 21, fig. 7. 2.*

in ‘Grave 2’ in Tumulus no. III/4 at Németsbánya (Table 3. 60). According to the anthropological analysis, the disturbed burial mound (Grave 3) was the final resting place of an adult woman – however, this result never got into international circulation.<sup>4</sup> In my opinion, the four separate ‘grave’ remains unearthed at different points of the tumulus belonged to a single burial – a phenomenon not without analogies, observed on field and confirmed by anthropological evaluation several times before. In 1988, I found three casting moulds with a Keftiu or oxhide ingot mould among them, admixed with human remains, in Section K-6, Pit A at Górkápolnadomb (Table 3. 38). These finds were published shortly after their discovery,<sup>5</sup> and the identification of the ingot mould as a ‘Keftiu’ type has become accepted by international research.<sup>6</sup> Besides their publication, one of the casting moulds found at Górkápolnadomb was subjected to scanning electric microscope analysis with considerable results: its raw material was identified as rhyolite from Sárszentmiklós (county Fejér) at a distance of approximately 150 km.<sup>7</sup> The object’s inner surface contained tin (Sn) and lead (Pb) remains, indicating its one-time use in casting processes. The thin section samples taken for petrographic analysis from most casting moulds from Górkápolnadomb became lost around the end of the 1990s, during the integration of the Central Museum Directorate into the Hungarian National Museum. As a consequence, Bálint Péterdi had to carry out such analyses on other Middle Bronze Age moulds in the collection of the Hungarian National Museum, of mostly unidentified origin but sometimes with their findspot known Füzesabony-Öregdomb (Table 2. 20), Sarkad area (Table 2. 55), Százhalombatta-Földvár (Table 2. 65A), Százhalombatta-Téglagyár (Table 2. 65B), Szelevény-Demeter-part (Table 2. 66), Tiszakeszi (Table 2. 72).<sup>8</sup> In the meantime, I have published a short study about the find material of a metal workshop discovered at Górkápolnadomb.<sup>9</sup> Furthermore, the petrographic analysis of the Urnfield-period moulds from Sármellék (Table 3. 79, fig. 5) was completed in 2022; the publication of the results is scheduled for the following year.

Next, I started to collect casting moulds and finds related to bronzeworking from sites all over the Carpathian Basin. My goal was to prepare a manuscript, together with Tibor Kovács, for a single volume for the series *Prähistorische Bronzefunde*. He started a similar investigation earlier, focusing on finds from Transdanubia, and already had several drawings and descriptions prepared for a monographic publication (see the back of *Inventaria Praehistorica Hungariae* 6, where the volume *Neuere bronzzeitliche Hortfunde Transdanubiens* is marked as upcoming – regrettably, it was never completed in the end). Tibor Kovács was obtained from scientific work by his tasks as General Director of the Hungarian National Museum and later by his lasting illness and death in 2013. Finally, as it had already been announced, *Prähistorische Bronzefunde* became discontinued (manuscripts were not accepted after 2010), and the founding editor, Hermann Müller-Karpe, died in 2013. These circumstances forced me to rethink my publishing goals.

Several observations were presented in a study during the first collecting phase.<sup>10</sup> These can be summarised as the followings:

1. The number of casting moulds and objects related to bronzeworking and the number of related sites is constantly growing with time throughout the Bronze Age (Early Bronze Age: 22 sites, Middle Bronze Age: 52 sites, Late Bronze Age: 65 sites);
2. The metalsmiths’ burials were usually associated with high prestige in all periods, as indicated by 11 grave finds from 9 sites;<sup>11</sup>

<sup>4</sup> *Ilon* 1989 18, fig. 6; *Ilon* 1996 108; *Jockenhövel* 2018 239, Table 1, Abb. 10. c.

<sup>5</sup> *Ilon* 1992.

<sup>6</sup> *Primas* 2005; *Jones* 2007; *Ciugudean* 2010; *Popa* 2015.

<sup>7</sup> *T. Biró* 1995.

<sup>8</sup> *Péterdi* 2004.

<sup>9</sup> *Ilon* 2003.

<sup>10</sup> *Ilon* 2006.

<sup>11</sup> See also *Jockenhövel* 2018 especially Abb. 2, Table 1.

3. High-volume, quasi-industrial production of bronze objects can only be hypothesised in the Late Bronze Age Urnfield cultural complex.<sup>12</sup> During the Urnfield period, the settling of specialists working with metal was undoubtedly way more concentrated and, in many cases, centralized than during the preceding centuries, as marked by the great abundance of moulds and other accessories of metalworking in the archaeological record of these places (e.g. Romania: Ciumești; Slovakia: Radzovce, Výsný Kubín; Hungary: Górkápolnadomb, Polgár, Celldömölk-Ság-hegy, Várköly-Nagyláz-hegy, Velem-Szent Vid; Croatia: Sveti Petar). I attempted to reveal the connection between the centralization of bronzeworking and settlement network in a complex analysis of Urnfield-period sites in Northwest Transdanubia;<sup>13</sup>

4. I presumed (with some caution) a geographical division of tasks related to bronzeworking, meaning that mining could have been a priority in copper ore resource areas, while other territories probably dealt mainly with processing (melting and casting). In other words, the communities of the archaeological cultures concerned probably maintained an active connection network.<sup>14</sup> This chain of hypotheses seemed to have been confirmed by the known distribution of related finds: considerably fewer casting moulds (or none) were registered in copper ore resource areas in the Slovakian and Transylvanian Ore Mountains compared to their peripheral regions and territories poor in, or devoid of ore resources. I considered this theory correct even knowing that the copper ore surface outcrops in the Mátra Hill Range were still known and exploited as late as the 18th century BC.

#### *Materials and new database*

Most data in my former database was sourced from publications. To complete that, in 2008, I sent a circular to my Hungarian archaeologist colleagues, while in 2017, another opportunity opened for me due to a Momentum project of the Hungarian Academy of Sciences. As a result, a new, more extensive, and more detailed database was created and, as a concluding act and spectacular addition to this work, a former student of mine, Gyula Isztin, created graphic renderings of the collected data to visualize their distribution on separate survey maps for each period (*figs. 1–3*).

The history of castings is closely bound up since its very beginnings, i.e. the Copper Age, with the storage and distribution structures and patterns of the related societies. Oval ingots appeared in several areas around the turn of the 5th and 4th millennia BC, contemporaneous roughly to the Middle Copper Age in the Carpathian Basin: in Central Europe (e.g. Handlová [Nyitrabánya, SK], Szeged-Szilér) and the territories of Iran, Georgia, Armenia, Jordania and Lower Egypt. Besides, axe-shaped ingots also appeared at that time. Those were cast in clay moulds that perhaps also served as cupels.<sup>15</sup>

Among single-use mould types, clay moulds (e.g. Hidegség-Templom-domb: *Table 1. 8, fig. 4*) had a much better chance of persisting than those in sand. Most mould finds, however, are in stone.<sup>16</sup> The identification of their materials is not unproblematic, though: without scientific material analysis, one cannot be sure whether a piece made seemingly from stone is indeed stone or a special kind of fired-through clayey admixture ('artificial stone') resembling that. As I did not have the chance to examine most finds enrolled in the catalog part (*Tables 1–3*), the identification of their materials was sourced from related publications.

<sup>12</sup> *Ilon 2006* List 3, Abb. 5–6.

<sup>13</sup> *Ilon 2007*.

<sup>14</sup> See also in more recent summaries of the topic: *Krenn-Leeb 2010; Radovijević et al. 2019* 161.

<sup>15</sup> *Czajlik 2012* 67; *Apakidze – Hansen 2020* 49–50, fig. 10.

<sup>16</sup> *Nessel 2019* 163–165, Abb. 186.



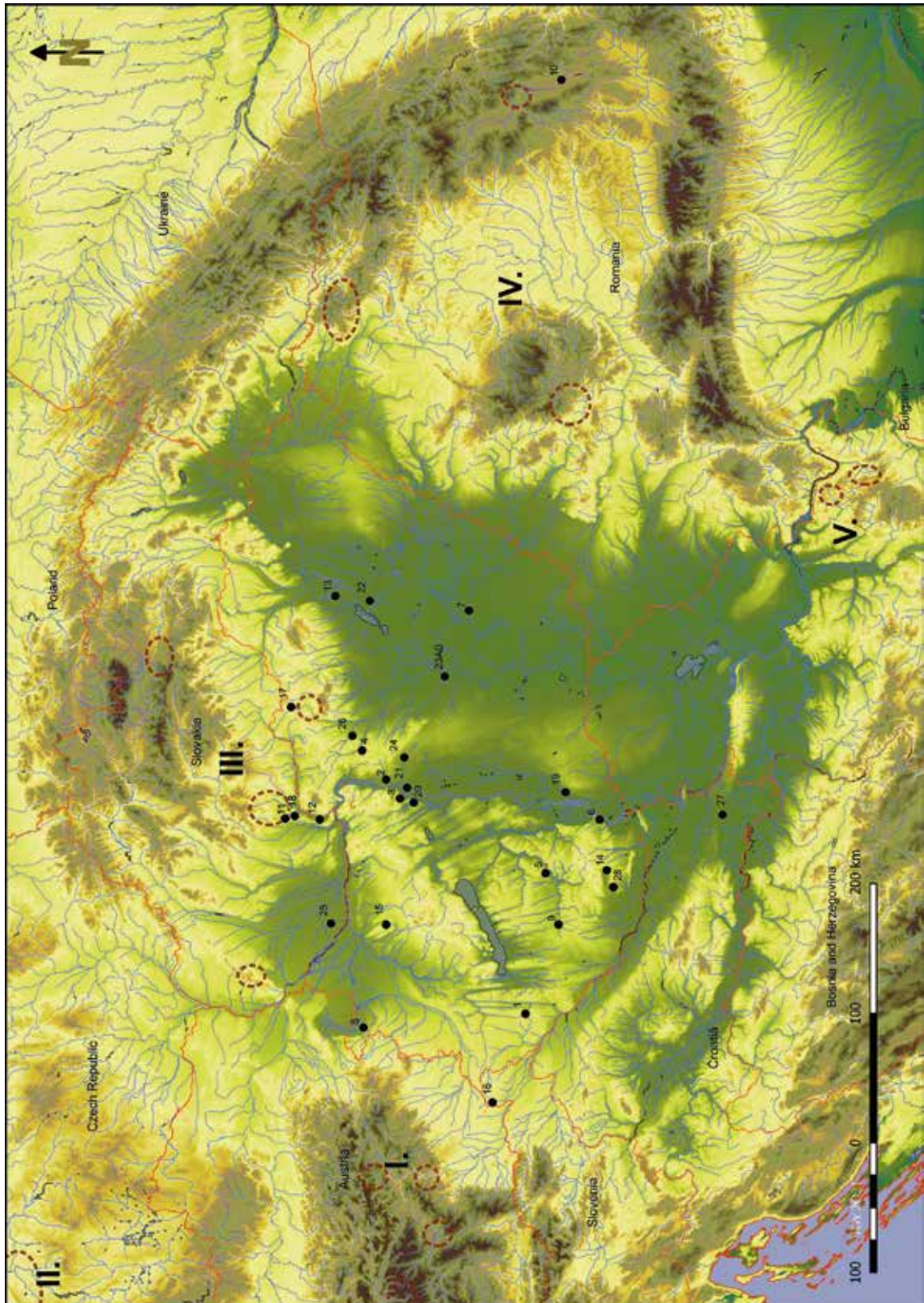


Fig. 1. Sites with casting moulds from the Early Bronze Age of the Carpathian Basin. Distribution map of the sites in *Table 1* (©Gábor Ilon, ©Gyula Isztin)



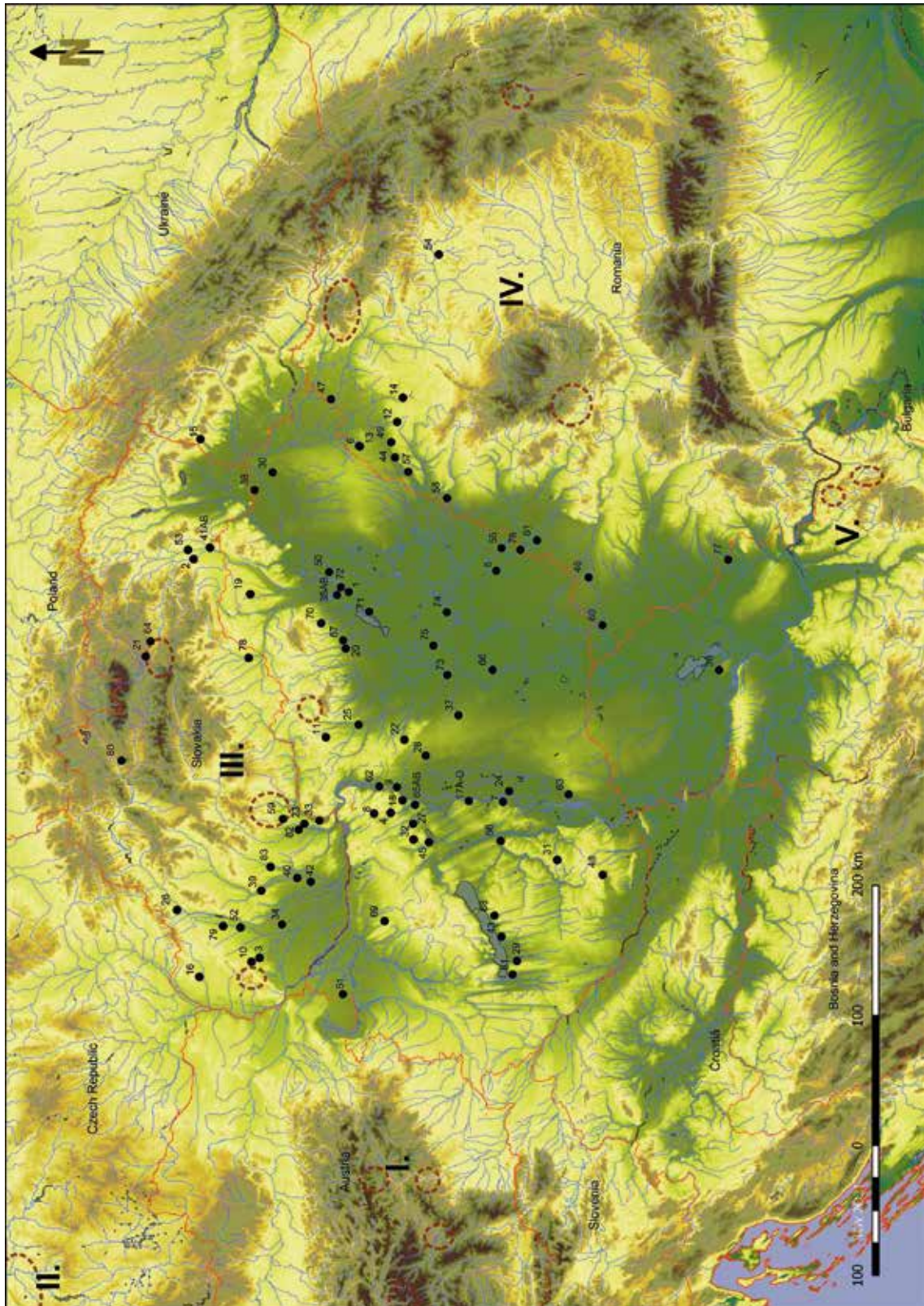


Fig. 2. Sites with casting moulds from the Middle Bronze Age of the Carpathian Basin. Distribution map of the sites in *Table 2* (©Gábor Ilon, ©Gyula Isztin)



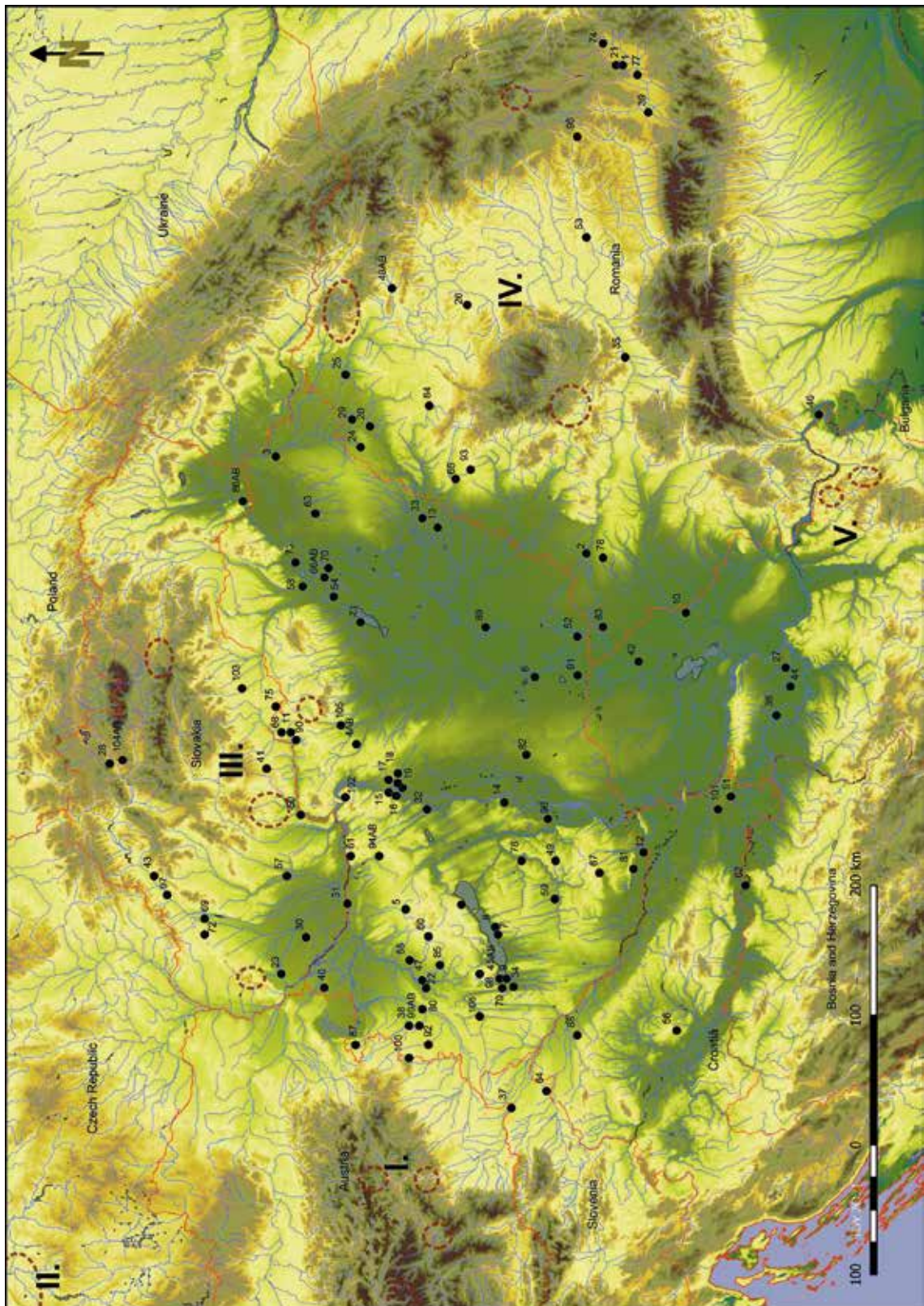


Fig. 3. Sites with casting moulds from the Late Bronze Age of the Carpathian Basin. Distribution map of the sites in *Table 3* (©Gábor Ilon, ©Gyula Isztin)

The results of my collection, according to the current Bronze Age chronology<sup>17</sup> in Hungary, are the following:<sup>18</sup>

*Early Bronze Age* (Mozsolics BI, absolute dates: 2600–1900 BC)

Casting moulds are registered from altogether 28 sites: 23 of these were found in settlement context, in four cases there was probably a workshop in the settlement, i.e. more than three moulds were discovered in a closed context (H: No. 19. Sükösd-Szúnyogosi-dűlő, No. 20. Százhalombatta-Földvár, No. 24. Üllő-Site No. 5, No. 28. Zók-Várhegy) (*Table 1, fig. 1*). The quantity and spatial distribution of the sites only allow one for drawing perhaps some consequences regarding the processed copper ores in the Slovakian Ore Mountains.<sup>19</sup>

One mould was found in a grave (H: Hidegség-Templom-domb [*Table 1, 8, fig. 4*]) in four cases, the precise find context is unknown. With these, we can count six new sites compared to those published in 2006.

*Middle Bronze Age* (Mozsolics BII to BIIIb/BIV, 1900–1650/1500 BC)

Casting moulds are registered from altogether 83 sites: 69 were found in settlement context, while two in depots inside settlements (SK: No. 83. Želiezovce, 3 pcs.) (*Table 2, fig. 2*). In 31 cases there was probably a workshop in the settlement, SK: No. 2. Barca (Košice), No. 3. Báhoň, No. 10. Budmerice, No. 40. Nitriansky Hrádok-Zámeček, No. 41B. Nižná Myšľa-Várhegy, No. 59. Santovka (Malinovec)-Nad Búrom, No. 79. Veselé-Hradisko, No. 83. Želiezovce; RO: No. 6. Berea-Zsidó-tag, No. 12. Cehălut-Kismező, No. 44. Otomani-Cetatea de pământ, No. 46. Pecica-Nagysánc, No. 58. Sântion-Dealul Mănăstirii; H: No. 1. Ároktó-Dongó-halom, No. 7. Bölske-Vörösgyír, No. 17B. Dunaújváros-Kosziderpadlás, No. 19. Felsővadász-Várdomb, No. 20. Füzesabony-Öregdomb, No. 25. Hatvan-Strázsa-hegy, No. 28. Kakucs-Balladomb, No. 32. Lovasberény-Mihályvár, No. 37. Nagykőrös-Földvár, No. 38. Nagyrozvány-Pap-domb, No. 65A–B. Százhalombatta-Földvár and Téglagyár, No. 67. Szihalom-Árpádvár, No. 71. Tiszafüred-Ásotthalom, No. 72. Tiszakeszi, No. 73. Tószeg-Laposhalom; SRB: No. 36. Mošorin-Feudvar (*Table 2, fig. 2*). One casting mould was found in the Danube by Dunaújváros in the 19th century; it may got there as a result of erosion of layers of a Bronze Age settlement by the river bank.

Based on geographical vicinity, the communities of No. 1. Ároktó-Dongó-halom, No. 71. Tiszafüred-Ásotthalom, and No. 73. Tószeg-Laposhalom (*Table 2, fig. 2*) utilised the copper obtained from the Recsk-Lahócza mine area in the Mátra Mountain Range.<sup>20</sup>

The bronze production of several sites in today's Slovakia and Hungary, SK: No. 2. Barca (Košice), No. 3. Báhoň, No. 10. Budmerice, No. 40. Nitriansky Hrádok-Zámeček, No. 41A–B. Nižná Myšľa-Várhegy, No. 79. Veselé-Hradisko, No. 83. Želiezovce; H: No. 17B. Dunaújváros-Kosziderpadlás, No. 38. Nagyrozvány-Pap-domb, No. 65A–B. Százhalombatta-Földvár and Téglagyár (*Table 2, fig. 2*), was probably based on the mines of the Slovakian Ore Mountain Range.<sup>21</sup>

Sites in Romania today (RO: No. 6. Berea-Zsidó-tag, No. 12. Cehălut-Kismező, No. 44. Otomani-Cetatea de pământ, No. 46. Pecica-Nagysánc, No. 58. Sântion-Dealul Mănăstirii) (*Table 2, fig. 2*) probably relied on copper ore resources identified as region IV.<sup>22</sup>

<sup>17</sup> As defined by Bóna 1975 23–26; Mozsolics 1984 Table 1; Kiss et al. 2015 figs. 3, 5, 11–12; Ilon 2015b Taf. 20–22; Szabó 2017; Ilon 2019 Abb. 3–4.

<sup>18</sup> In the following section, the countries are abbreviated, Croatia: HR, Hungary: H, Romania: RO, Serbia: SRB, Slovakia: SK, Slovenia: SLO, Ukraine: UA.

<sup>19</sup> Czajlik 2012 fig. 2, region III.

<sup>20</sup> Czajlik 2012 fig. 2, Hungarian part of region III.

<sup>21</sup> Czajlik 2012 fig. 2, Slovakian part of region III; Garner – Stöllner 2021.

<sup>22</sup> Czajlik 2012 fig. 2, region IV.

The workshops of SRB: No. 36. Mošorin-Feudvar and H: No. 7. Bölske-Vörösgyár (*Table 2, fig. 2*) perhaps used ore from Rudna Glava.<sup>23</sup>

Seven specimens were discovered in graves within the boundaries of six sites (H: No. 9. Budapest, XXI-Csepel-sziget, No. 17A. Dunaújváros-Dunadűlő, No. 51. Pusztasomorja/János-somorja-Tímárdomb; SK: No. 34. Matúškovo, in a symbolic burial, No. 41A. Nižná Myšľa, in two burials, No. 80. Vyšný Kubín) (*Table 2, fig. 2*). The precise find context is unknown in nine cases. That means 31 more sites compared to 2006.

*Late Bronze Age* (end of Mozsolics BIIIb to BIV, BB1 to Ha B2/3, Tumulus and Urnfield cultures, 1650/1500–800/750 BC)

Casting moulds are registered from altogether 106 sites. The finds were discovered in settlement context in 77 cases, of which 22 indicate the presence of a workshop (*Table 3, fig. 3*). Based on the concentration patterns of moulds (four or more moulds per site), workshops with supralocal significance, producing for smaller or larger areas, were defined.

These are, connected with copper ore mines<sup>24</sup> in the Eastern Alpine region (H: No. 22. Celldömök-Ság-hegy, No. 98. Várvolgy-Nagyláz-hegy, No. 100. Velem-Szent Vid; SLO: No. 37. Gornja Radgona), in the Slovakian Ore Mountains (H: No. 3. Aranyosapáti-Temető, No. 102. Visegrád-Dió; SLO: No. 69. Pobedim, No. 75. Radzovce, No. 104A. Vyšný Kubín) and with the Reck-Lahócza mine at Mátra Hill (H: No. 66A–B. Oszlár-Nyárfaszög) (*Table 3, fig. 3*).

The topographical position of the settlement at H: No. 68. Piliny-Borsoshegy (*Table 3, fig. 3*) perhaps allowed it to access either or both copper resources in the Slovakian Ore Mountain Range and at Reck.

Transylvanian copper resources could have been utilised by metalsmiths in present-day R: No. 24. Ciamești, No. 39. Hălchiu (Brasso), No. 48A–C. Lăpuș, No. 78. Șagu, No. 95. Teleac, and in H: No. 52. Makó-Innenső Jángor 3, No. 91. Szeged-Szőreg C-Szív utca (*Table 3, fig. 3*).

The bronze production in the territory of H: No. 14. Bölske-Sziget, No. 67. Pécs-Makártető, No. 82. Soltvadkert-Büdöstő, and HR: No. 88. Sveti Petar-Ludbreški (*Table 3, fig. 3*) was probably based on copper obtained from mines at Rudna Glava.

Casting moulds were found in settlement depots in nine sites: H: No. 3. Aranyosapáti-Temető, No. 12. Beremend, No. 82. Soltvadkert-Büdöstő, No. 91. Szeged-Szőreg-Szív utca, a pit in cemetery C; RO: No. 24. Ciamești, No. 29. Domanesti; No. 39. Hălchiu (Brasso), No. 95. Teleac; HR: No. 88. Sveti Petar Ludbreški (*Table 3, fig. 3*). One mould was discovered in a cave (RO: No. 35. Geoagiu-Kőalja hegy) (*Table 3, fig. 3*), while from four sites mould were found in graves (SK: No. 43. Ilava, No. 104A. Vyšný Kubín; RO: No. 48A–C. Lăpuș, Tumulus No. 11, 13, 16; H: No. 60. Némethánya-Felsőerdei dűlő) (*Table 3, fig. 3*). Furthermore, unpublished moulds are presented in this study from Western Transdanubia (H: No. 31. Danube's bed [Almásneszmély–Győr], No. 79. Sármellék-Száraz-eleje, No. 100. Velem-Szent Vid) (*Table 3, fig. 3, fig. 5*). In 23 cases, the precise find context is unknown. That means 41 sites more compared to 2006.

### Results

The distribution of the sites on the survey maps (*figs. 1–3*) suggests that almost all copper ore resource areas<sup>25</sup> were already known since the beginning of the Bronze Age. Metal industry of the Tumulus and Urnfield cultures in Western Transdanubia probably relied on mines in the

<sup>23</sup> Czajlik 2012 fig. 2, region V.

<sup>24</sup> Czajlik 2012.

<sup>25</sup> Krause 2003 Abb. 7, 11, 15; Czajlik 2012 fig. 2; Pernicka – Lutz – Stöllner 2016 fig. 14; Radivojević et al. 2019 fig. 1.

Eisenerz Alps in Styria and at Trieben in Upper Styria and especially on mines and settlements specialised in pre-processing of ores in Lower Austria (Prigglitz-Gasteil, Rax-Goggnitz). While the mentioned Styrian mines were active around ca. 1200–900 BC, the Lower Austrian ones emerged only around 1500–600 BC when the large early mines (e.g. Mitterberg, used from the 19/18–17th centuries) gradually became exhausted and abandoned.<sup>26</sup> During the Bronze Age, water transport was important in supplying the workshops with copper ore. In the case of Middle Bronze Age Western Transdanubia, the Rába and Zala rivers, both originating in the Eastern Alps, must have played a crucial role in transportation. The third main body of water was the Danube, in the case of which one must assume upstream transportation of copper from the Rudna Glava area. It must be taken into account, however, that the rivers were probably significantly slower at the time as their beds were unregulated and their floodplains much more extended. The transportation of raw materials from the Slovakian Ore Mountain Range<sup>27</sup> (*fig. 3*) to the territory of Northeast Transdanubia and the broader area of Budapest must certainly have been realised using the Danube and its subsidiaries (Garam and Ipoly). The almost complete lack of moulds in Northwest Transdanubia during the Middle Bronze Age is conspicuous (the two known examples are No. 51. Pusztasomorja-Jánossomorja-Tímárdomb and No. 69. Tarjánpuszta-Vasasföld II [*Table 2, fig. 2*]), even though the mines near Mitterberg and in Slovakia were active during this period.<sup>28</sup> Currently, there is no satisfying explanation for the lack of casting moulds in the inner territories of Transylvania; one rather suspects methodological issues in the background, like selective access to publications or significant quantities of unpublished finds.

A statistical comparison of the data sets published in 2006 and the present paper clearly shows a significant increase in Middle Bronze Age data points (due primarily to Tünde Horváth's, Alexandra Găvan's and Bianka Nessel's studies).<sup>29</sup> A concentration of metal production points (31 workshops) as early as the Middle Bronze Age also seems unquestionable. The loci of centralization seem to have changed to new places during the Late Bronze Age, while the production profile also shifted towards larger series as marked by both the increased number of casting moulds per centre as well as by the higher total amount of such finds.

In the case of settlements, a feature was only interpreted as 'workshop' when it contained more than one casting mould and, perhaps, also other relics and accessories of metalworking (bronze slag, ingots, tuyeres) referring to local production. It must also be noted that 1. every casting mould found on a settlement is interpreted as a relic of metalworking; 2. where other relics and accessories of metalworking were found together with the moulds one might speak about local production; and 3. casting moulds in depots unanimously refer to nearby workshops, i.e. to production of metal objects in large series. Features are interpreted as 'central workshop' which may have been producing for more than a single settlement if more than three casting moulds and preferably other relics, by-products, and accessories of metalworking are known from the related find material.

The current possibilities of interpretation allow one to drawing a much more refined picture than before. During the Bronze Age, or at least in its late phase, metalworking and ~production must have been concentrated in hill areas, plainlands (not necessarily near to an exploited resource area), and highlands (*fig. 3*). Earlier, during the Middle Bronze Age the active mines in the Slovakian Ore Mountain Range (Czajlik's region III, including the Mátra Hill Range) and the suspected processing

<sup>26</sup> Czajlik 1993 341; Czajlik – Molnár – Solymos 1999 43; Czajlik 2012 20, 41, 43, *fig. 2*; Kiss 2009 *fig. 3*; Stöllner 2005 Abb. 1; Stöllner 2015 Abb. 1, Abb. 9; Trebsche – Pucher 2013 118–199, Abb. 3; Falkenstein 2017 9.

<sup>27</sup> Czajlik 2012 *fig. 2*, region III; Stöllner 2021 3–6, Abb. 1.

<sup>28</sup> Pernicka – Nessel – Mehofer 2016 23–25, *figs. 4–5*; Radivojević *et al.* 2019 161–162, *fig. 1*.

<sup>29</sup> Horváth 2004; Găvan 2015; Nessel 2019.



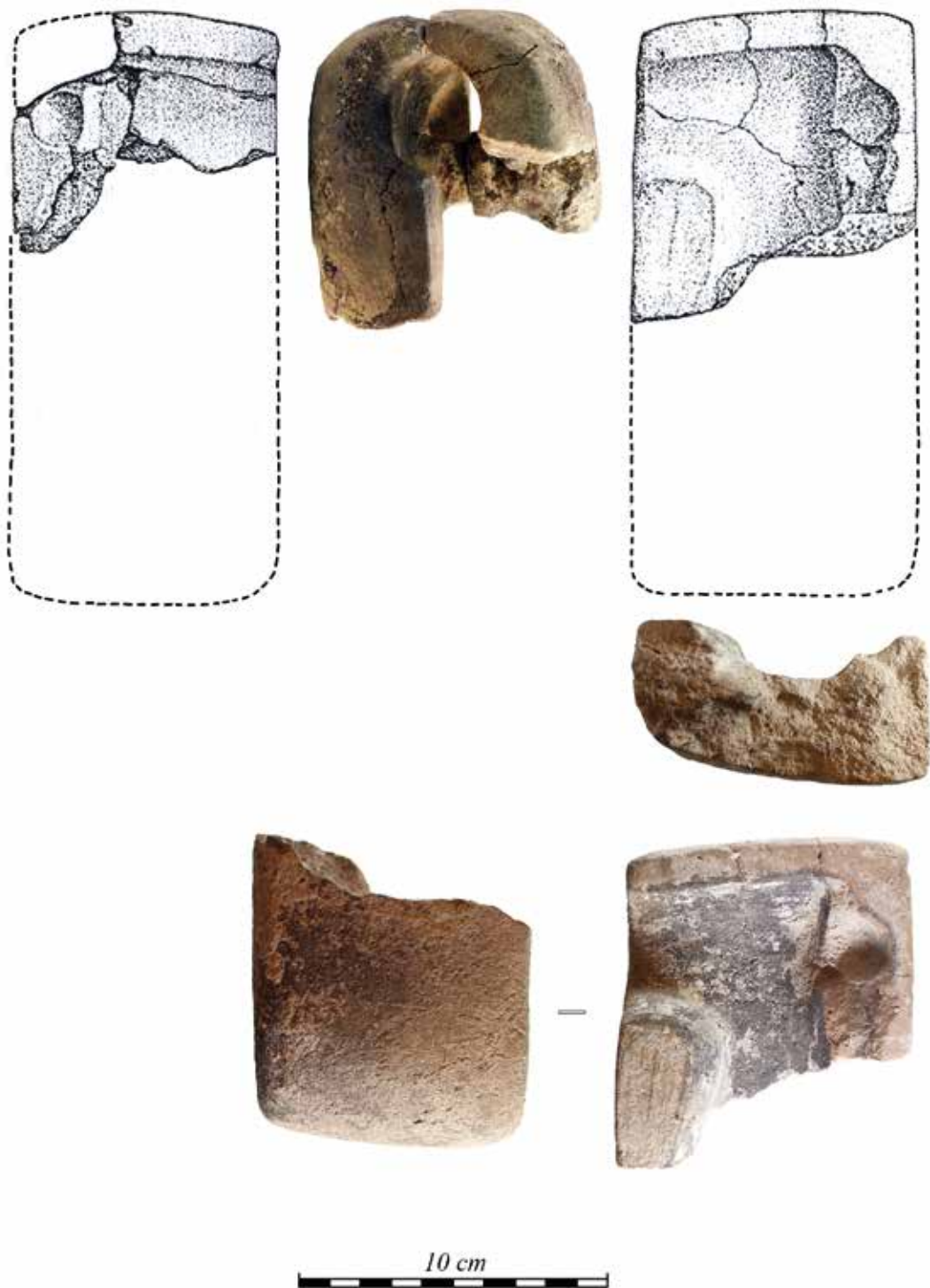


Fig. 4. Casting mould of an axe. Hidegség-Templom-domb

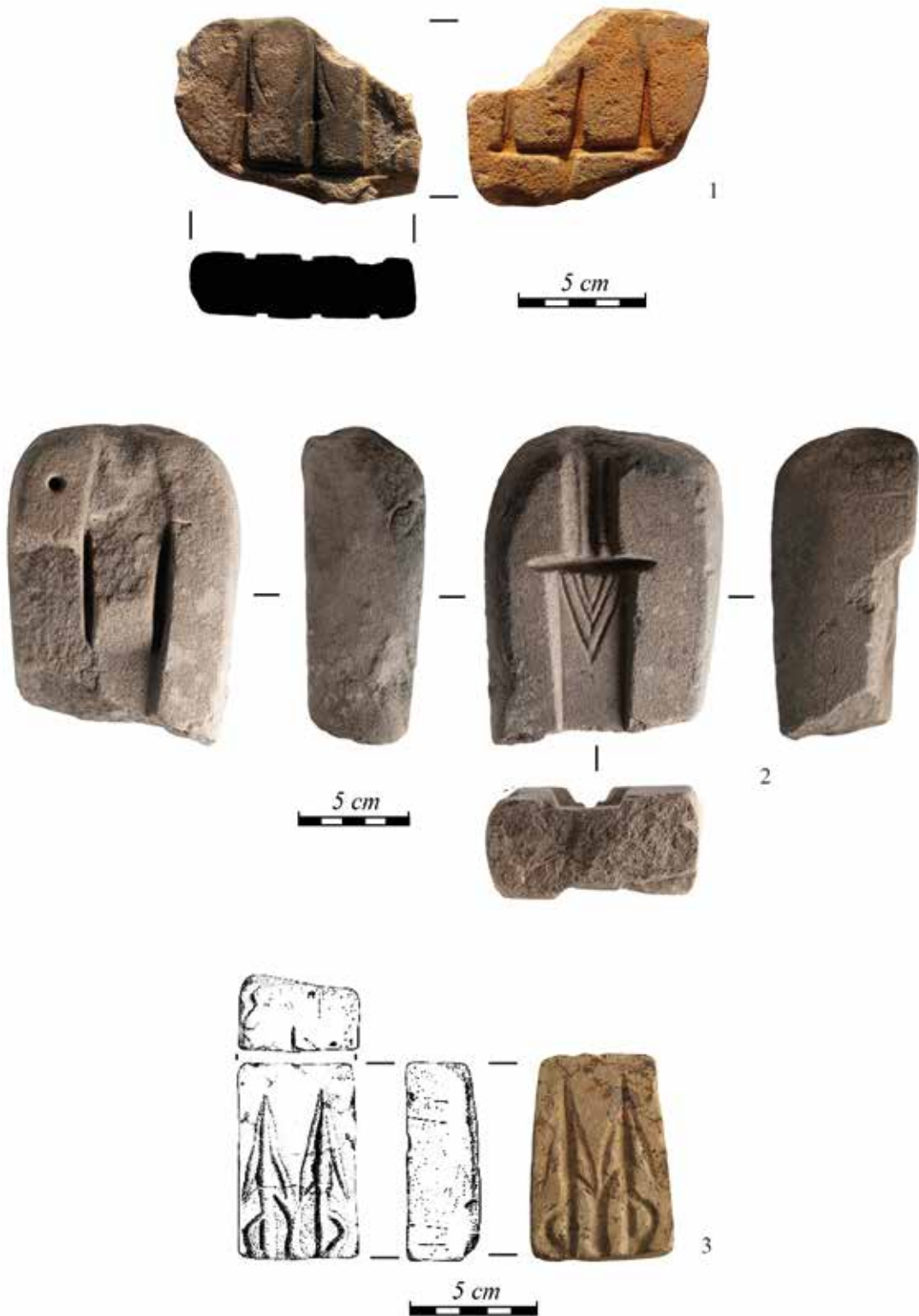


Fig. 5. Casting moulds of arrowheads and socketed axes. 1. Danube's bed (Almásneszmély–Győr); 2. Sármellék-Száraz-eleje; 3. Velem-Szent Vid

sites containing casting moulds were much closer. As for the Early Bronze Age, the scarcity and scattering of related sites deprived one of the possibilities to draw valuable conclusions.

### *New questions and tasks*

The current state of research delineates future tasks. Further scientific research would be best aided by a public database containing all published casting moulds, with descriptions and pictures for the finds, made freely accessible for interested researchers. Creating such a database could be the goal of a joint international research project, under which every side of every casting mould becomes photographed and measured, and as many objects as possible undergo a petrographic analysis.<sup>30</sup> This analysis could enable a distinction between clay and ‘artificial stone’ moulds and also include a raw material resource location for stone moulds which might give away further information on connections between, and work distribution patterns inside cultural units. In the following phase, this database would be worth completing with related finds dated to the Copper<sup>31</sup> and Iron Ages, as well as making it public. Also, a composition analysis project should be conducted, characterising the copper ores of various mines and describing the by-products (slags and ingots) of bronze production.

An evaluation system comprising unambiguous criteria should be developed to distinguish between higher-level central workshops (characterised by almost ‘industrial’ production) and lesser ones engaged primarily in repair and domestic production, serving only a household or a single settlement at best.

One of the most urgent tasks is a complex petrographic analysis of large series of casting moulds (preferably all) according to an elaborate protocol, realised preferably in international cooperation. Research has no fair chance to leap forward without exploiting these pieces of information from the currently available finds.<sup>32</sup>

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<https://doi.org/10.31577/slovarch.2020.suppl.1.1>

<sup>30</sup> *Koós 2016*.

<sup>31</sup> *Bondár 2019*.

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No.	Current name	Former name	Lands/parcel	Country, county, district	Site/find context	Object to cast	Material of the casting mould	State of the casting mould	Dating (period/culture)	Other metal-working finds	Literature	Notes
1.	Bárrönce		Temetői dűlő	H, Zala	settlement	pin	clay	fragmented	Somogyvár–Vinkovci culture		<i>Bondár 1995</i> 214–216, Taf. 181, 432; <i>Ilon 2006</i> 276–277, Liste 1, Abb. 1–2.	
2.	Budapest, I.		Várhegy, Szt. György tér, Sándor-palota	H	settlement, sacrificial pit	spearhead	sandstone	fragmented	Nagyrev culture		<i>Hampy 1997</i> .	
3.	Diósd		Sziddónia/Szadvári-hegy	H, Pest	settlement pit	axe, pendant	sandstone	intact (?)	Nagyrev culture		<i>Patay 1965</i> Abb. 5, <i>Bóna 1992</i> 49; <i>Péterdi 2004</i> 508, 515, Table VIII. 1, VIII. 4; <i>Ilon 2006</i> 276–277, Liste 1, Abb. 1–2.	
4.	Domony			H, Pest	unknown	shaft-hole axe	unknown		Makó–Kosihy–Čaka culture		<i>Kalicz 1968</i> Taf. X. 1, <i>Bóna 1992</i> 49; <i>Ilon 2006</i> 276–277, Liste 1, Abb. 1–2.	
5.	Döbrököz		Tűzköves	H, Tolna	fortified settlement, stray find, from fieldwalking	shaft-tube axe	unknown	fragmented	Somogyvár–Vinkovci culture		<i>Miklós 2002</i> 197; <i>Kulesár 2009</i> Cat. no. 49; <i>Ilon 2006</i> 276–277, Liste 1, Abb. 1–2.	
6.	Dunaszekcső		Várhegy	H, Baranya	unknown	axe	unknown		Vučeđol culture		<i>Eseedy 1990</i> 227–228, fig. 9; <i>Bóna 1992</i> 49; <i>Eseedy 1998</i> 33; <i>Ilon 2006</i> 276–277, Liste 1, Abb. 1–2.	Unclear drawing.
7.	Endrőd		Paraj-hegy dűlő	H, Békés	settlement	axe	sandstone	fragmented	Makó–Kosihy–Čaka culture		<i>MRT 8</i> 147–148.	
8.	Hídsgég		Templom-domb	H, Győr-Ménfőcsanak-Sopron	settlement	two-piece mould of a Kozarac-type axe	clay	intact (?)	Somogyvár–Vinkovci culture		<i>Gömöri 1992</i> 14; <i>Ilon 2006</i> 276–277, Liste 1, Abb. 1–2.	
9.	Kaposfűlak		Várdomb-dűlő	H, Somogy	settlement, features 144, 191 and 702.	3 axes with a Kozarac-type among them	clay	fragmented	Somogyvár–Vinkovci culture		<i>Somogyi 2004</i> 167, Abb. 14–16; <i>Ilon 2006</i> 276–277, Liste 1, Abb. 1–2.	
10.	Leitceni	Csikszentlélek		RO, jud. Harghita	settlement	two-piece mould of a shaft hole axe	unknown	fragmented	Jigodin culture		<i>Roman – Doidl-Oprjescu – János 1992</i> Taf. 78. Ia, 2a; <i>Denes – F. Szabó 1998</i> 95–97, Abb. 7; <i>Ilon 2006</i> 276–277, Liste 1, Abb. 1–2.	
11.	Santovka (Malinovec)	Magyarád/Hévnagyarád	Santovka (Malinovec)	SK, okr. Levice	fortified settlement	Tőszeg-type axe	tuffite	fragmented	Early Hatvan culture		<i>Bátora 2009</i> 199.	
12.	Maté Kosihy	Ipolykiskeszi	Törökdőmb	SK, okr. Nové Zámky	fortified settlement		unknown		Hatvan culture		<i>Bátora 2009</i> 201, fig. 7.	
13.	Mezőcsát		Pásirdomb	H, Borsod-Abaúj-Zemplén	settlement	dagger	unknown		Hatvan culture		<i>Bóna 1992</i> 50; <i>Ilon 2006</i> 276–277, Liste 1, Abb. 1–2.	
14.	Nagyvárpád (Pécs)		Dióseő	H, Baranya	settlement pit	shaft-hole axe	unknown		Somogyvár–Vinkovci culture		<i>Eseedy 1982</i> 79, 83, 90, Abb. 45, Taf. 9, 5; <i>Bóna 1992</i> 49; <i>Ilon 2006</i> 276–277, Liste 1, Abb. 1–2.	
15.	Ravaszd		Villibald-domb	H, Győr-Ménfőcsanak-Sopron	settlement pit	Kozarac-type shaft-hole axe	unknown		Somogyvár–Vinkovci culture		<i>Bóna 1992</i> 49; <i>Eseedy 1995</i> 35; <i>Ilon 2006</i> 276–277, Liste 1, Abb. 1–2.	

16. <b>Rogašovci</b>	Szarvaslak	SLO, Prekmurje	unknown	daggers	unknown	unknown	unknown	Vucedol culture	<i>Ecsedy 1995 35; Ilon 2006 276–277, Liste 1, Abb. 1–2.</i>
17. <b>Salgótarján</b>	Pecskő	H, Nógrád	unknown	shaft-hole axe	unknown	unknown	unknown	Makó–Kosihy–Čaka culture	<i>Kerek 1968 19; Bóna 1992 49; Kovács 1996 116, Abb 1; Ilon 2006 276–277, Liste 1, Abb. 1–2.</i>
18. <b>Százdice</b>	Század	SK, okr. Levice	fortified settlement	pin		clay	fragmented	Hatvan culture	<i>Bátora 2009 201.</i>
19. <b>Siklód</b>		H, Bács-Kiskun	settlement, pit 32	Approx. 20 moulds. Two-piece mould of a Kozarac type shaft-hole axe (1 intact, 1 half missing, fragments), flat axe		clay	partially reassembled, fragmented	Early Nagyrév culture	Poster at the MZMOS conference at Százalombatta in 2017; <i>Somogyvári 2020 443–444, fig. 4.</i>
20. <b>Százalombatta</b>	Földvár	H, Pest	tell settlement, a workshop in layer Vb	moulds		unknown	fragmented	Nagyrév culture	<i>Poroszlai 1993 14; Poroszlai 2000a 103, 105; Ilon 2006 276–277, Liste 1, Abb. 1–2.</i>
21. <b>Szécsen-szentmiklósi</b>	Údülősor	H, Pest	settlement	shaft-hole axe(?)		sandstone	fragmented	Bell Beaker culture	<i>Endrédi 1992 96, Abb. 77, 7; Ilon 2006 276–277, Liste 1, Abb. 1–2.</i>
22. <b>Tiszafüred</b>	Ásothalom	H, Jász-Nagykun-Szolnok	tell settlement	axe		unknown	fragmented	Hatvan culture	<i>Bóna 1975 156, Taf. 196, 8; Ilon 2006 276–277, Liste 1, Abb. 1–2.</i>
23. <b>Töszeg A</b>	Laposhalom	H, Jász-Nagykun-Szolnok	settlement	adze and rod		clay	no data	Nagyrév culture	<i>Bóna 1992 50; Ilon 2006 276–277, Liste 1, Abb. 1–2.</i>
23. <b>Töszeg B</b>	Laposhalom	H, Jász-Nagykun-Szolnok	settlement, level IX.	shaft-hole axe, two piece mould of a battleaxe (1909/e and 1927/XII.)		stone	fragmented	Hatvan culture	<i>Márton 1931 Abb. 13–14; Mészöcsics 1967 Abb. 2; Kálicz 1968 Taf. 101. Ia–b; Bóna 1992 48, 50, Abb. 20; Ilon 2006 276–277, Liste 1, Abb. 1–2.</i>
24. <b>Üllő</b>	Site No. 5	H, Pest	settlement, feature 5605.	two-piece mould of a socketed adze, Kozarac-type shaft-hole axe, etc.	unknown	unknown	intact	Makó–Kosihy–Čaka culture	<i>Horváth 2004 27; Kóvári – Patay 2005 113–123; Ilon 2006 276–277, Liste 1, Abb. 1–2.</i>
25. <b>Veľký Meder</b>	Nagymegyert	SK, okr. Dunajská Streda	settlement	Kozarac-type shaft-hole axe		clay	fragmented	Makó–Kosihy–Čaka culture	<i>Bátora 2003 22, Abb. 17, 7; Ilon 2006 276–277, Liste 1, Abb. 1–2.</i>
26. <b>Verseg</b>	Makkos	H, Pest	settlement, 1984, section I, level 2, –20/23–40/43 cm	two-piece moulds for pins		sandstone	intact	Hatvan culture	Description from the cardboard register.
27. <b>Vinkovci/Vinkovce</b>	Tržnica	HR, Vukovarsko	settlement	6 Kozarac-type shaft-hole axes, rod		unknown	intact	Classical Vučedol culture	<i>Bátora 2003 16.</i>
28. <b>Zók</b>	Várhegy	H, Baranya	settlement, pit 1977/36	flat axes, arrowhead or miniature socketed adze, Fajsz and Kozarac-type axes		clay	may be reconstructed, fragmented	Vučedol culture	<i>Bóna 1992 49; Ecsedy 1982; Ecsedy 1990 227, fig. 8, 1–3; Ecsedy 1995 Abb. 16; Ilon 2006 276–277, Liste 1, Abb. 1–2.</i>

Table 1. Early Bronze Age casting moulds of the Carpathian Basin (Croatia: HR; Hungary: H; Romania: RO; Slovakia: SK; Slovenia: SLO)

No.	Current name	Former name	Lands/ parcel	Country, county, district	Site/find context	Object to cast	Material of the casting mould	State of the casting mould	Dating (period/culture)	Other metal-working finds	Literature	Notes
1.	Árvoktő		Dongó-halom	H. Borsod-Abaúj-Zemplén	tell settlement	pin or rod, tutulus, shaft-tube axe, two heart-shaped pendants (unfinished)	sandstone (?)	parts missing	Classical and Late Füzessabony/Otomani culture		<i>Kalicz 1968</i> Taf. LXX. 9–10; <i>P. Fischl 2006</i> 137. The axe and the pendants are unpublished.	Excavation of T. Kemencei in 1966.
2.	Barca (Košice)	Bárcá		SK, Košice	fortified settlement	B type ringbutt axe(?), armspiral, pin, lunula, disc	sandstone (?)	parts missing	Füzessabony/Otomani culture		<i>Fürmánek 1980a</i> Taf. 6. 116; <i>Novotná 1980</i> 184, Taf. 53. 1506–1508; <i>Bóna 1992</i> 62; <i>Gávan 2015</i> 197–198, Pl. 24. 1–7.	
3.	Báhoň	Báhoň		SK, Pezinok district	settlement	daggers, tweezers, two palstave axes	sandstone (?)	fragmented	Late Madarovec culture		<i>Barčík 1999</i> 187, Abb. 3.	
4.	Bia (Biatorbágy)		Óregtögy	H, Pest	settlement	adze(?)	sandstone	fragmented	Late Vátya culture		<i>Horváth 2004</i> 17, Abb. 5. 1.	
5.	Békés		Várdomb	H, Békés	tell settlement	pins	stone	fragmented	Gyulavarsánd/Otomani culture		<i>Banner – Bóna 1974</i> 64–65, Taf. 28. 10.	
6.	Berea	Bere	Zsidó-tág	RO, kr. Satu Mare	settlement	3 Hajdúsámson type battle-axes, two adzes	stone	intact, parts missing	Ottomani I.		<i>Báder 1978</i> 120, LXIII. 4–6, 10–11; <i>Sorocanu 2012</i> 22, Taf. 7–8; <i>Molnár 2014</i> Pl. 167. 5, 7, Pl. 169. 3–4, 8.	From the collection of I. Kovács.
7.	Bölcske		Vörösgyőr	H, Tolna	tell, workshop	pin (?), ring, flat adze	sandstone	fragmented	Vátya I–III.	tuyere fragment, anvil, combined anvil and workbench	<i>Bóna 1975</i> 272; <i>Horváth – Koszák – Pető 2000a</i> 198, Taf. 5. 5, 7; <i>Horváth 2004</i> Abb. 5. 2–3.	
8.	Budajenő		Hegyiszmánok	H, Pest	fortified settlement, pins 689 and 696	several objects, e.g. spearhead	sandstone	no data	Vátya III–Koszider period	slag	<i>Repiszky 2004a</i> , <i>Repiszky 2004b</i> ; <i>Szabó 2018</i> 76; <i>Szabó in print</i> .	I only have a photo of one of the moulds as a courtesy of N. Szabó.
9.	Budapest, XXI.		Csepel-sziget	H	urn grave in cemetery	flat axe, pin, dagger(?)	sandstone (?)	fragmented	Vátya II.		<i>Nagy 1973</i> 60, Abb. 13; <i>Bóna 1975</i> 272; <i>Bóna 1992</i> 52; <i>Horváth 2004</i> 41–42, Abb. 17. 6.	
10.	Budmerice	Gidrafa		SK, okr. Pezinok	fortified settlement	rod or ingot, three pins, axe	unknown	intact (rod), fragmented	Madarovec culture	tuyeres (3 pcs), slag	<i>Varvák et al. 2015</i> figs. 1–2.	
11.	Buják		Tarisznyapart	H, Nógrád	settlement	bet buckle(?), sickle	sandstone (?)	no data	Hatvan culture, Koszider period		<i>Tárnoki 2010</i> 55–56, Taf. 5. 1–2.	
12.	Céháuf	Magyarcsaholy	Kismező	RO, kr. Satu Mare	settlement	C type shaft hole axe, 3 pcs	sandstone (?)	intact	Gyulavarsánd/Otomani culture, Hajdúsámson horizon		<i>Bóna 1992</i> 52; <i>Sorocanu 2012</i> 27, Taf. 9–10; <i>Molnár 2014</i> Pl. 169. 5–7.	
13.	Ciumești	Csomaköz		RO, kr. Satu Mare	settlement	pin	unknown	intact	Gyulavarsánd/Otomani		<i>Molnár 2014</i> Pl. 171. 8.	
14.	Dersida	Kisderzsáda	Dealul lui Bălăoă	RO, jud. Sălaj	tell	adze, flat rhomboid object	sandstone	intact (adze), unknown	Wietenberg II.	tuyere, ingot	<i>Gávan 2015</i> 148, 156. 161; <i>Gávan 2015</i> 188–189, Pl. 4. 3–5.	
15.	Djakove	Nevelenlalu	Kiserdő - Mondiesteg	UA, Zakarpatska oblast	settlement	unknown pin (?), arm ring	stone	fragmented	Early Felsőszécs/Suciu de Sus/Stamovo culture		<i>Baloguri 1974</i> 44, fig. 9. 20, 23, 24; <i>Baloguri 2001</i> 263, fig. 70a. 20, 23, 24.	
16.	Dojč	Dócs		SK, okr. Senica	settlement (?) stray find, gift	belt buckle	sandstone	intact	Madarovec		<i>Báča – Barčík 2012</i> .	
17A.	Dunaújváros A		Dunadűlő	H, Fejér	grave 1029/960	two-piece cast of a lunula	red sandstone	intact	Vátya I (II?) – B.A2		<i>Moszolics 1967</i> 137, Taf. 19. 2; <i>Bóna 1975</i> 55, Taf. 46. 9; <i>Moszolics 1984</i> 54; <i>Bóna 1992</i> 52; <i>Horváth 2004</i> 41, Abb. 8. 2; <i>Jackenhovel 2018</i> 233; <i>Jankovits 2017</i> Taf. 45. 1492.	

17B. Dunaújváros B		Koszider-padlás	H, Fejér	settlement	socketed adze, disc pendant, pin, dagger, unknown	mica, striped sandstone	intact (socketed adze), fragmented	Vatya II–III. and Koszider period		<i>Horváth 2004</i> 20, 33; <i>Gávan 2015</i> 189, Pl. 5, 6, 6. 1–2, 4; <i>Jankovits 2017</i> 1940.
17C. Dunaújváros C		Duna/Danube	H, Fejér	riverbed	Kíftenov type axe-adze	mica	fragmented	Vatya culture		<i>Horváth 2004</i> 17, 20, fig. 6, 1–2; <i>Gávan 2015</i> 189, Pl. 6, 3.
17D. Dunaújváros D		Rácdomb	H, Fejér	settlement (?)	flat axe	sandstone	intact, fragmented	Middle Bronze Age		Unpublished. Excavation of J. B. Horváth in 1993; the description and a photograph are a courtesy of T. Keszti.
18. Érdliget (Érd)			H, Pest	unknown	dagger	sandstone	fragmented	Vatya II–III.		<i>Horváth 2004</i> 20.
19. Felsővadász		Várdomb	H, Borsod-Abaúj-Zemplén	settlement	two rods(?), miniature knife	sandstone	fragmented	Hatvan and Early Füzesabony cultures		<i>Kóós 1991</i> 13–15, fig. 4, 2–3; <i>Gávan 2015</i> 191, Pl. 13, 1–3.
20. Füzesabony		Öregdomb	H, Heves	tell settlement	Füzesabony type shaft-hole axe, pins	sandstone	fragmented	Füzesabony culture		<i>Szablmári 1994</i> Cat. nos. 344–345.
21. Gánóce	Gánóc		SK, okr. Poprad	settlement	dagger; unknown, pin	stone	fragmented	Middle Bronze Age		<i>Gávan 2015</i> 237; <i>Hudák et al. 2020</i> 219, 224, fig. 23–24.
22. Gomba		Várhegy	H, Pest	settlement	unknown, pin(?)	local sandstone	fragmented	Vatya culture	ladle	Excavation of G. Kulcsár and E. Bolgár in 1997, unpublished.
23. Grantal-Ipeltal	Garam-Ipoly vidéke/völgye		SK	unknown	5 pcs.	unknown	no data	Late Madarovec culture		<i>Barik 1999</i> 187, 190.
24. Harta		Weierhívi	H, Bács-Kiskun	settlement, pit 107	axe(?)	sandstone	fragmented	Middle Bronze Age		Unpublished. Excavation of R. Kusár in 2003.
25. Hatvan		Strázsa-hegy	H, Heves	tell settlement	two rods, dagger hilt, unfinished? two-piece mould of dagger (2 pcs.)	stone, sandstone	fragmented, parts missing, intact	Late Hatvan and Early Füzesabony cultures	tuyeres (2 pcs.)	<i>Gávan 2015</i> 193, Pl. 15, 6–8; <i>Tarbay 2019</i> 8–11, 15, 17, 31, 33–34, fig. 2, 4, 7, 12–4.
26. Ivanovce	Ivánháza	Bašta	SK, okr. Trenčín	settlement (?)	two armrings	stone	fragmented	Madarovec		<i>Bátora 2009</i> 207, fig. 14.
27. Kajászó		Várdomb	H, Fejér	settlement, section II, level 7	socketed axe-adze, pendant, rippled rods	local red and yellow sandstone	intact (axe and rods), fragmented	Vatya II. and Koszider period, Early Tumulus culture		<i>Horváth 2004</i> 17, 20.
28. Kakucs		Balladomb	H, Pest	tell settlement	unknown, pin fragment(), 2 pinheads	sandstone	fragmented	Vatya III.	tuyere, slag	<i>Horváth 2004</i> 13, 24.
29. Kéthely		Baglyas-hegyről Ny-ra	H, Somogy	unknown	four spoke wheel pendant, lunula	unknown	fragmented	Transdanubian Encrusted Pottery culture		<i>Kuzsinszky 1920</i> 30–31, fig. 37, 16.
30. Kisvárd			H, Szabolcs-Szatmár-Bereg	unknown	C type shaft hole axe	unknown	no data	Gyulavarsand/Otmani culture		<i>Bóna 1992</i> 52.
31. Lengyel (Mucsi)		Sánc	H, Tolna	settlement	comb pendant, adze or ingot(?), ring	stone	intact, fragmented	Transdanubian Encrusted Pottery culture		<i>Horváth 2004</i> 17; <i>Patek 1968</i> 59, Taf. 78, 13–14; <i>Bóna 1975</i> 215, Taf. 269, 10–12; <i>Kovács 1986</i> 100, Abb. 1; <i>Jankovits 2017</i> Taf. 47, 1493.
32. Lovasberény		Mihályvár	H, Fejér	settlement, workshop	mushroom head pins, belt buckle, mushroom head pin	sandstone, metamorph	intact (belt buckle), fragmented	Vatya culture Koszider period	barren moulds in clay	<i>F. Petres – Bándi 1969</i> 174–175; <i>Horváth 2004</i> 11, 24; <i>Gávan 2015</i> 238.

No.	Current name	Former name	Lands/parcel	Country, county, district	Site/find context	Object to cast	Material of the casting mould	State of the casting mould	Dating (period/culture)	Other metal-working finds	Literature	Notes
33.	Malé Koshihy	Ipolykiskeszi	Törökdomb	SK, Nové Zámky	settlement	dagger	unknown	parts missing	Madarovec culture		<i>Barik 1999</i> 190; <i>Bátora 2009</i> fig. 7.	
34.	Martískovo	Taksomyfalva		SK, okr. Galanta	grave 50, a symbolic burial	dagger	sandstone	fragmented	Aunjeitz culture	2 stones for crushing ore, tuyeres (4 pcs.)	<i>Bátora 2002</i> 193, fig. 14; <i>Ilton 2006</i> 276–277, Liste 1, Abb. 1–2; <i>Jockenhovel 2018</i> 232, Table 1, Abb. 5, C	
35A.	Mezőcsát		Oroszdomb	H, Borsod-Abaúj-Zemplén	settlement	crutched pendant, open pendant	sandstone	fragmented	Hatvan culture with Füzesabony pottery finds		<i>Koós 1991</i> 5, 9–10, fig. 4, 1; <i>Jankovits 2017</i> 126, Taf. 47, 1494A–B.	Excavation of N. Kalicz in 1960.
35B.	Mezőcsát		Oroszdomb	H, Borsod-Abaúj-Zemplén	settlement	lunula	sandstone	intact	Füzesabony culture, Koszider period		<i>Koós 1991</i> 9–13, fig. 4, 1.	
36.	Mošorin	Mozsor	Feudvar/ Földvár	SRB, Vojvodina	tell settlement, workshop in a house corner in section E	arming, spearhead, flanged axe, dagger, knife, adze	clay	fragmented	classical Vattina, RB A.2, Hänsel FD III.	polishing stone, corepieces	<i>Hänsel – Medović 1991</i> 71–72, 82–83, Taf. 11–12, Abb. 3–4; <i>Gávan 2015</i> 201–202, Pl. 28–35.	
37.	Nagykőrös		Földvár	H, Pest	settlement, layer 3, house or workshop and other places	unknown, pin	sandstone	fragmented	Varya III.		<i>Hornváth 2004</i> 24, 27.	
38.	Nagyrozságy		Pap-domb	H, Borsod-Abaúj-Zemplén	settlement	toggled pendant, two lunulae with an axe mould on the backside of one of them, conical headed pin, pin with arrowhead on the backside, pin with concentrical rings on the backside	sandstone		Füzesabony culture		<i>Koós 2008</i> ; <i>Koós 2016</i> .	Excavation of J. Koos between 2005–2007 preceding the building of a water reservoir at Cigánd.
39.	Nitra		Mostná ulica	SK, okr. Nitra	settlement	winged axe, butt-ring fragment of an axe	sandstone	broken into pieces, reconstructable	Late Madarovec culture		<i>Barik 1999</i> 187, Abb. 4; <i>Bátora 2009</i> 209, fig. 18, 1–2.	
40.	Nitriansky Hradok	Kisvárad	Zámeček	SK, okr. Nové Zámky	fortified settlement, sector B/14 pit. 306, D/15 pit. 300	rings, pin, rippled arming, small spheres	unknown	fragmented	Madarovec culture	tuyeres (14 pcs.)	<i>Točík 1978</i> Taf. 80, 12; <i>Barik 1999</i> 187; <i>Gávan 2015</i> 204, Pl. 42, 1–5.	
41A.	Nížná Myšľa	Alsómislye		SK, okr. Kosice	grave 133	two-piece mould of a rod or pin	sandstone	intact	Early Füzesabony culture (1965–1754 BC)		<i>Olexa 1987</i> Abb. 1, Abb. 2, 11; <i>Bátora 2002</i> 193, fig. 16; <i>Gávan 2015</i> 206; <i>Jaeger – Olexa 2015</i> 154, 156, fig. 3, 6.	
41A.	Nížná Myšľa	Alsómislye		SK, okr. Kosice	grave 280	two-piece mould of a rod or pin	sandstone	intact	Early Füzesabony culture (1965–1754 BC)	hammer for crushing ore, tuyere	<i>Olexa 1987</i> 262, Abb. 3, Abb. 4, 2, 6; <i>Olexa 2003</i> Abb. 23; <i>Kovács 1995</i> 40, Abb. 19, 2; <i>David 2002</i> Taf. 246, 8, 5; <i>Bátora 2002</i> 193, fig. 15; <i>Gávan 2015</i> 206; <i>Jaeger – Olexa 2015</i> 156, fig. 4–6; <i>Jockenhovel 2018</i> 232.	
41B.	Nížná Myšľa	Alsómislye	Várhegy	SK, okr. Kosice	settlement	two daggers, tutulus, rod	sandstone, one tuilet (for gold?)	fragmented	Füzesabony culture	tuyere	<i>Olexa 2003</i> Table VII, XI, XIII, Taf. XV, 17.	

42. <b>Nové Zámky</b>	Érsekújvár	Zofjiska osada	SK, okr. Nové Zámky	stray find from settlement (?)	bell buckle	unknown	fragmented	Madarovec/Tumulus culture		<i>Liszka 1984</i> 148, fig. 77. 3.	
43. <b>Ordacsehi</b>		Kis-töltés	H, Somogy	settlement	pin (?)	stone	fragmented	Transdanubian Encrusted Pottery culture		<i>Kultsár 2002</i> 26.	
44. <b>Otomani</b>	Ottomány	Cetatea de pământ	RO, jud. Bihor	tell settlement	tutulus, sickle, B1 type ring-buttet axe	sandstone	intact	Middle Bronze Age III.		<i>Ordenitch – Lie – Ghemik 2014</i> 141, Pl. V. 9; <i>Molnár 2014</i> Pl. 167. 12, Pl. 172. 10; <i>Gávan 2013</i> 147, Pl. IV. 3; <i>Gávan 2015</i> 207–208.	The find material perhaps got admixed with the moulds from Otomani Cetăuș(ă) = Dealul Cetăușii
45. <b>Pákozdi</b>		Várhegy	H, Fejér	settlement	pin, 2 pcs.	clay	fragmented	Vatya culture, Koszider period		<i>Horváth – Kosák – Pető 2001</i> 14; <i>Horváth 2004</i> 13; <i>Farkas-Pető – Horváth – Kosák 2004</i> 120–121.	
46. <b>Pécs</b>	Ópécska/Pécska	Nagysánc	RO, jud. Arad	tell settlement	bell buckle, pin or rod, daggers, spearheads, flat axes, socketed adzes, Hajdúsámsón type battle-axes	clay, sandstone	intact, fragmented	layers X to XVI. Maros/Perjámos-Vattina culture		<i>Dömötör 1902</i> 271–4, 273–10, 272–3, 273–6, fig. 7–8; <i>Roska 1912</i> 17, 31–32, 36–37; <i>Abb. 25</i> , 55, 1, 56, 1–2, 57, 67; <i>Kovács 1975</i> 26, fig. 4, 2; <i>Bóna 1992</i> 50; <i>David 2002</i> 84, 89, Abb. 2. 6–7; <i>Horváth 2004</i> 24, 27; <i>Horváth – Gogéltan 2014</i> Abb. 4; <i>Gávan 2015</i> 210–212.	
47. <b>Pécs</b>	Pete	Határakelő	RO, jud. Satu Mare	settlement, feature 10/14	pins(?)	stone	fragmented	Early Felsőszécs/Suciu de Sus culture		<i>Gávan 2015</i> 239.	
48. <b>Pécs</b>		(Meesek) Szaboles	H, Baranya	settlement	shafthole axe (Bóna: Aegean-Anatolian type; Horváth: Kftenov-type)	unknown	fragmented	Transdanubian Encrusted Pottery culture		<i>Bánda – F. Peres – Maráz 1979</i> 103–104; <i>Kovács 1994a</i> 121; <i>Bóna 1992</i> 53–54; <i>Horváth 2004</i> Table 3.	
49. <b>Pir</b>	Szilágypér	Cetate	RO, jud. Satu Mare	settlement	C type shafthole axe, Hajdúsámsón type battle-axe	sandstone	intact, parts missing	Otomani culture		<i>Bóna 1975</i> 133; <i>Bóna 1992</i> 52; <i>Gávan 2013</i> 166–167; <i>Molnár 2014</i> Pl. 171. 5.	
50. <b>Polgár</b>		Kenderföldek	H, Hajdú-Bihar	tell settlement	Tőszeg B type shafthole axe	unknown	fragmented	Late Hatvan/Early Füzesabony culture		<i>Bóna 1992</i> 52; <i>Gávan 2013</i> 214.	
51. <b>Prusztasomorja/Jánosomorja</b>		Timárdomb	H, Győr-Ménfőcsanak	grave A	flat axe, ingot(?)	sandstone	fragmented, reassembled	Gáta-Wieselburg culture		<i>Melis 2019</i> 232–233, fig. 3. 1–2.	
52. <b>Ratkovec</b>	Ratkóc		SK, okr. Hlohovec	settlement	reversed heart-shaped open pendant	unknown	intact	Middle Bronze Age		<i>Furmánek 1980a</i> 21, Taf. 10. 182.	
53. <b>Rozhanovec</b>	Rozgony	Plebanské II.	SK, okr. Kosice	settlement	dagger	sandstone	fragmented	Otomani culture		<i>Bátora 2009</i> 210; <i>Gávan 2015</i> 215.	
54. <b>Rusn de Jos</b>	Alsóroszfalu		RO, jud. Bistrița-Năsăud	settlement	C type shafthole axe	unknown	intact	Wietenberg culture		<i>Kőszegi 1957</i> 48, Taf. VIII. 1. 3; <i>Bóna 1992</i> 52; <i>Sorocanu 2012</i> 82–83, Taf. 24.	
55. <b>Sarkad area</b>			H, Békés	unknown	lunula, disc	sandstone	no data	Middle Bronze Age		<i>Péteri 2004</i> 503, Table VIII/1.	HNM Inv. no. 4/1900.93.
56. <b>Simontornya</b>		Malom u.	H, Tolna	unknown	corepiece for socketed objects	unknown	no data	Vatya culture		<i>Horváth 2004</i> 27.	
57. <b>Sicuteni</b>	Székelyhíd	Ókőrvár	RO, jud. Bihor	settlement (?)	axe	unknown	fragmented	Gyulaársánd/Otomani culture		<i>Molnár 2014</i> .	

No.	Current name	Former name	Lands/parcel	Country, county, district	Site/find context	Object to cast	Material of the casting mould	State of the casting mould	Dating (period/culture)	Other metal-working finds	Literature	Notes
58.	Sántion	Bihar-szentjános	Dealul Mănăstirii	RO, jud. Bihor	tell settlement	three axes on two moulds, two flat axes, socketed adze	sandstone	parts missing	Gyulavarsánd/Otomani culture		<i>Bóna 1975</i> 133; <i>Bóna 1992</i> 52; <i>Gávan 2013</i> 147–148, 167; <i>Gávan 2015</i> 215–216.	
59.	Santovka (Malinovec)	Szántó	Nad Bítrom	SK, Levice	settlement	Tőszeg type shaft-hole axe, dagger, pin, undescribed objects	sandstone	fragmented	Madaróceve-Northern Transdanubian Encrusted Pottery culture	tuyeres (2 pcs.)	<i>Bátora 2009</i> 203, fig. 9, 1–2; <i>Gávan 2015</i> 216, Pl. 59, 1–2.	
60.	Sánnicolau Mare	Nagy-szentmiklós	Căvajdia	RO, jud. Timiș	unknown	two wires or rods	unknown	fragmented	Bronze Age		<i>Gogăltan 1999</i> 108, fig. 12, 3.	
61.	Socodor	Székudvar	Várhegy	RO, jud. Arad	settlement	socketed chisel	stone	fragmented	Middle Bronze Age		<i>Gávan 2015</i> 216–217.	
62.	Soroksár (Budapest, XXIII.)		Várhegy	H	settlement	dagger and pin	local sandstone from the Buda hills	fragmented	Várya culture, Koszider period		<i>Endrődi – Gyulai 1999</i> fig. 18, 6a–b; <i>Horváth 2004</i> 27.	
63.	Silkösd		Tallér	H, Bács-Kiskun	settlement	Koszider type pendant	sandstone	no data	Szeremle culture		<i>Bánda – Kovács 1969</i> 106–107, Taf. X, 14; <i>Horváth 2004</i> 20; <i>Jankovits 2017</i> Taf. 61, 2244.	
64.	Spišský Štvrtok	Csitörtékhely	Mysia Horka	SK, okr. Levoča	fortified settlement	Mycene type dagger/rapier, flat or flanged axe	sandstone, clay	fragmented	Otomani culture, B A2		<i>Vladár, 1974</i> 227, Abb. 13; <i>Bozsek, 2004</i> 281, Abb. 2, 1; <i>Gávan 2015</i> 218, fig. 60, 1.	
65A.	Százhalombatta		Földvár	H, Pest	tell settlement	socketed adzes, two daggers, rings, Koszider type pendant, conical pendant, socketed axe later transformed into adze, miniature axe or arrowhead, pin, razor tutulus, ring	sandstone, clay (socketed)	fragmented	Nagyrev culture (one adze), Várya I. and III, Koszider period	tuyeres (2 pcs.)	<i>Poroszlai 2000b</i> 16, 19, 23–24, fig. 17a–b; <i>Horváth 2004</i> 12–13, 20, 27, 29, fig. 13, 2, fig. 14, 2; <i>Horváth – Kozák – Péter 2000b</i> 113, Pl. IV, 1–2; <i>Gávan 2015</i> 220, Pl. 65, 1–3, 66, 1–2.	
65B.	Százhalombatta		Teghgyár	H, Pest	unknown	dagger with lengthwise rippled blade (2 pcs.), conical headed pin and a dagger with lengthwise rippled blade	sandstone	no data	Middle Bronze Age		<i>Péterdi 2004</i> 507, Table VIII, 1. HNM Inv. no. 66.17.1401.	
66.	Szelevény		Demeter-/Menyasszony-part	H, Jász-Nagykun-Szolnok	tell settlement	pin with biconical, pierced head	unknown	fragmented	Middle Bronze Age		<i>Péterdi 2004</i> 503, Table VIII, 1. HNM Inv. no. 138/1883.525.	
67.	Szihalom	Árpádvár/Földvár		H, Heves	tell settlement	two flat adzes (Horváth: Cőfalva type axe), Tőszeg type shaft-hole axe, tutulus(?), pin(?), beads	clay, sandstone	intact	Hatvan culture	tuyeres (4 pcs.)	<i>Hampel 1886</i> Taf. 3, 1, 3, 5–6; <i>Mozsolics 1973</i> 85; <i>Bóna 1992</i> 50; <i>Horváth 2004</i> Table 3.	
68.	Szöföld			H, Somogy	settlement (?)	two-piece mould of a spearhead	stone	intact	Transdanubian Encrusted Pottery culture		<i>Kuzsinszky 1920</i> 16–19, Abb. 21; <i>Bóna 1975</i> 217, Taf. 270, 25; <i>Kovács 1975</i> 34, Abb. 4, 6; <i>Kiss 2012</i> 139, fig. 37, 3.	
69.	Tarjánpuszta		Vasasföld II.	H, Győr-Ménfőcsanak	settlement	axe	unknown	no data	Transdanubian Encrusted Pottery culture		<i>Gömöri 1980: Gömöri 1992.</i>	No photo or drawing available.
70.	Tibolddarc		Bércút	H, Borsod-Abaúj-Zemplén	settlement	flat axe, flat, rod-shaped ingot	sandstone, stone	fragmented	B II, Late Hatvan culture	tuyeres (3 pcs.)	<i>Mozsolics 1967</i> 99; <i>Gávan 2015</i> 222–223, Pl. 68, 6–7.	



71. Tiszafüred		Ásothalom	H. Jász-Nagykunszabolok	teill settlement, uppermost layer	8 moulds; 3 lunulae, disc (tutulus), bell-hook, pin fragments or rods	sandstone	intact, fragmented	Vatya culture, Koszider period RB2 (?)	tuyere	<i>Bóna 1960;</i> <i>Bóna 1992</i> 58–62; <i>Kovács 1994b</i> fig. 89, Cat. no. 332–340; <i>Hornáth 2004</i> 20, 24; <i>Gávan 2015</i> 223–224; <i>Jankovits 2017</i> Taf. 40, 1253–1256, Taf. 48, 1498–1499, Taf. 66, 2399.	HNM Inv. no. 62.3.34–36.
72. Tiszakeszi			H. Borsod-Abaúj-Zemplén	unknown	axe, pin or rod, two pendants, conical headed pin	unknown	fragmented	B III		<i>Péteri 2004</i> 507, Table VIII. 1.	
73. Tószeg		Laposhalom	H. Jász-Nagykunszabolok	teill settlement	undescribed mould from layer o (Nagyrev culture); small socketed adzes (layer B 1903, layer C 1909/c, Early and Classical Middle Bronze Age), adze, lunula, ring-headed pin (phase B 1948/I and 1974/IX), another moulds (phase C: 1908/3-5, 1909/c-d, 1911/A.3, 1974/B and level IX), two Tószeg-type axes	clay, sandstone	fragmented	Tószeg C = RB2 = B III = Vatya culture	tuyeres (9 pcs.)	<i>Nagyrevi c.; Mozsolics 1952</i> 47, Taf. XVIII. 5; <i>Banner – Bóna – Márton 1957</i> 116, Abb. 19, 17–19, Taf. 9, 1, Taf. 19, 17–19; <i>Mozsolics 1967</i> 19, Abb. 2; <i>Bóna 1992</i> 48, 50, Cat. no. 342–343; <i>Gávan 2015</i> 225–227.	
74. Turkeve		Terehalom	H. Jász-Nagykunszabolok	teill settlement	axe	sandstone	fragmented	Gyulavarsánd, Koszider period	tuyere	<i>Csányi – Tárnoki 1994</i> 165, Cat. no. 346–347.	
75. Türrök-szentmiklós		Terehalom	H. Jász-Nagykunszabolok	settlement	shaft-hole axe	unknown	fragmented	Classical and Late Hatvan culture		<i>Bóna 1992</i> 50.	
76. Várсанд	Gyulavarsánd		RO, jud. Arad	teill settlement	flat axe	unknown	fragmented	Gyulavarsánd/Otománi	tuyere	<i>Bóna 1975</i> 133, Taf. 150, 14; <i>Bóna 1992</i> 52; <i>Gávan 2015</i> 228.	
77. Vatin	Vátina/ Versecevat		SRB, Vojvodina	teill settlement	Hajdúsámson type axe on both sides	stone	no data	Maros/Perjámos – Vattina		<i>Milkeker 1905</i> 12–13, Taf. III. 1a–b, <i>Bóna 1992</i> 50.	
78. Vécince	Méhi		SK, okr. Rimavská Sobota	fortified settlement	pendant, unidentifiable objects	unknown	fragmented	Hatvan culture		<i>Bátora 2009</i> 201, fig. 6; <i>Gávan 2015</i> 229–231.	
79. Veselé	Vígvar	Hradisko	SK, okr. Preštáň	settlement, pendant from pit 91	palstave axe, flat axe, adze, sickle, pin, pendants	stone, sandstone, unknown	fragmented	Madarovec (after <i>Barrik 1996</i> , <i>Barrik 1998</i> , <i>Novotná 1970</i> , <i>Furmánek 1980a</i> 22), Madarovec/Tunulus culture ( <i>Bóna 1992</i> )	tuyeres (6 pcs.)	<i>Bóna 1992</i> 62; <i>Barrik 1996</i> 250, Taf. 3, 4; <i>Barrik 1998</i> 27, Abb. 1, 5; <i>Barrik 1999</i> 187, Abb. 2; <i>Novotná 1970</i> 101, Taf. 45, 846; <i>Gávan 2015</i> 231–232.	
80. Vysný Kubin	Felsőkubin		SK, okr. Dolný Kubin	cemetery	reversed heart-shaped open pendant	sandstone	intact	Middle Bronze Age (?)		<i>Kubinyi 1883;</i> <i>Furmánek 1980a</i> 28, Taf. 15, 403.	
81. Vörs	Battyáni disznólegelő		H. Somogy	settlement	socketed adze	clay	intact	Late Kisapostag culture		<i>Honti 1996</i> 49, 54; <i>Honti – Kiss 2000</i> 93; <i>Gávan 2015</i> 240.	
82. Vráble	Verebély	Fidvár/ Földvár	SK, okr. Nitra	fortified settlement	pin	clay	fragmented	Aunjetitz culture	tuyeres (5 pcs.)	<i>Bátora 2009</i> 199, 201, fig. 8, 7.	
83. Želiezovce	Zseliz		SK, okr. Levice	settlement depot	miniature palstave axe, flanged axe, dagger	unknown	unknown	Late Madarovec/ Late Tunulus culture, B IV		<i>Mozsolics 1973</i> 81; <i>Bóna 1992</i> 62; <i>Novotná 1970</i> 101, Taf. 45, 847–849.	

Table 2. Middle Bronze Age casting moulds of the Carpathian Basin (Croatia: HR; Hungary: H; Romania: RO; Serbia: SRB; Slovakia: SK; Slovenia: SLO; Ukraine: UA)

No.	Current name	Former name	Lands/parcel	Country, county, district	Site/find context	Object to cast	Material of the casting mould	State of the casting mould	Dating (period/culture)	Other metal-working finds	Literature	Notes
1.	Albis	Kézdialbis	Márton-kert	RO, jud. Covasna	settlement	socketed axe with handle	sandstone	parts missing	Gáva culture, Ha BI-2		<i>Puskás 2015</i> 8, Pl. 4. 1.	
2.	Arad	Arad		RO, jud. Arad	stray find	socketed axe with handle	stone	fragmented	Late Urnfield period		<i>Wanzek 1989</i> 200, Taf. 49. 6.	
3.	Aranyospáti		Temető	H, Szabolcs-Szatmár-Bereg	settlement (?) depot	socketed axe with handle (2 pcs.), dagger(?), small rods	sandstone	intact, parts missing	Mozsolics B VIa, Hajdúböszörmény horizon, Ha BI, Gáva	corepiece	<i>Mozsolics 2000</i> 33, Taf. 120-121.	
4A.	Aszód			H, Pest	stray find	needle (2 pcs.), with a mould for a spearhead on the backside of one	sandstone	intact	Urnfield period	corepiece	<i>Hampel 1886</i> Taf. 5. 1-3; <i>Mozsolics 1973</i> 81; <i>Mozsolics 1984</i> 49, Taf. 12; <i>Kovács 1986</i> Abb. 3. 3.	
4B.	Aszód			H, Pest	stray find	several moulds	unknown	no data	Piliny culture	bronze nuggets and slags	<i>Kövári 1976</i> 3; <i>Kövári 1980</i> .	
5.	Bakonyszentkirály			H, Veszprém	fortified settlement	no data	sandstone	fragmented	Late Urnfield period		<i>Nováki 1979</i> 103, Abb. 39. 4; <i>Wanzek 1989</i> 202-203.	
6.	Baks			H, Csongrád	settlement	sickle	unknown	no data	Gáva culture, Ha BI-3	bronze nuggets and ingots	Excavation of G. V. Szabó in 2007. From his presentation on 29.10.2008 in Tata; <i>V. Szabó 2011</i> Taf. 1.	
7.	Balatombogár			H, Somogy	settlement	socketed axe and ring	sandstone	fragmented	Urnfield culture		<i>Honti et al. 2004</i> 8, Taf. II. 6.	
8.	Balatonlelle			H, Somogy	settlement	no data	unknown	fragmented	Urnfield culture		<i>Honti et al. 2007</i> 52.	
9.	Balatonmagyaród			H, Zala	settlement, feature 269.	spearheadhead's end (2 pcs.), ring	sandstone	fragmented	Tumulus culture, B C		Without drawing or photo. <i>Horváth 1996</i> 60, 72, fig. 26.	Description by L. Horváth in 2008. Inv. no. 96.106.1. Thury György Museum, Nagykanizsa.
10.	Banatska Palanka			SRB, opš. Bela Crkva	stray find	blade part of an axe	stone	fragmented	Late Bronze Age		<i>Wanzek 1989</i> 196-197, Taf. 37. 7.	
11.	Benczúrfalva (Szécsény)			H, Nógrád	fortified settlement	axe	sandstone	fragmented	Mozsolics B IV, Piliny culture	tuyere, ladle	<i>Mozsolics 1973</i> 81, Taf. 111. 7-9, <i>Kemenzsei 1984</i> 107.	
12.	Beregend			H, Baranya	settlement depot	axe	unknown		Mozsolics B Vc, Gyermely horizon, Urnfield culture		<i>Mozsolics 1984</i> 50-51, <i>Báncsi - F. Petres - Maráz 1979</i> 123.	
13.	Berettyó-szentmárton (Berettyóújfalú)			H, Hajdú-Bihar	stray find/settlement(?)	socketed axe	stone	fragmented	Gáva (?), Urnfield period		<i>B. Kurtzán - Kólicz 1956</i> 96; <i>Wanzek 1989</i> 203, Taf. 49. 12.	
14.	Bélicske			H, Tolna	settlement	socketed axe (3 pcs.), knife, poppyhead pins, rods/wire (?)	sandstone (?)	fragmented	Urnfield culture	forge's grille	<i>Szabó 1996</i> 270, Abb. 5-6; <i>Szabó 2013</i> 133, Taf. 127-129.	
15.	Budapest, III.			H	stray find	socketed adze, pin	sandstone (?)	no data	end of tell cultures, B IV (Mozsolics)		<i>Schreiber 1968</i> 4; <i>Mozsolics 1973</i> 82; <i>Bóna 1992</i> 50.	

16.	Budapest, XI.		Skálla tehajtó	H	settlement	pendant	unknown	parts missing	Tumulus culture		Unpublished.
17.	Budapest, XIV.	Zugló, Vízakna u. 41/b.	H	settlement	two-piece mould of a palstave axe	unknown (?) sandstone (?)	intact	Tumulus culture, Mozsolics B IV, Rein. B B2		<i>Kőszegi 1968</i> 5; <i>Mozsolics 1973</i> 82, Taf. 112. 4a–c.	
18.	Budapest, XVII.	Rákosszabai Majorhegy	H	settlement, feature 99.	no data	unknown	no data	Tumulus or Urnfield culture		<i>Reményi et al. 2006</i> 175.	
19.	Budapest, XXI.	Csepel-Ujfalu	H	stray find	two rings	unknown	intact	B IV (Mozsolics)		<i>Mozsolics 1973</i> 85, Taf. 111. 5.	
20.	Căuș	Érkává	RO, jud. Satu Mare	settlement	ring	unknown	intact	Urnfield culture with Gáva pottery		<i>Bader 1996</i> 265, 278, Abb. 4. 7.	
21.	Cernat	Csernát	RO, jud. Covasna	settlement	axe, blade part of axe	stone	intact, fragmented	Late Bronze Age		<i>Székely 1970</i> fig. 1. 1; <i>Wanzek 1989</i> 200, Taf. 49. 4–5.	
22.	Celldömök		H, Vas	highland settlement	socketed axes with handle, adze, spearheadhead, arrow, pins, openwork pendant, rings	sandstone	parts missing, fragmented	Urnfield culture		<i>Lázár 1943</i> ; <i>Wanzek 1989</i> 204, Taf. 49. 8–9; <i>Mozsolics 2000</i> 37–39; <i>Jankovits 2017</i> 180–181, 193–194, Taf. 68. 2458, Taf. 71. 2504.	
23.	Chorvátsky Grob	Horvágturab	SK, okr. Senec	settlement, pit 9/07.	two-piece mould of a winged axe, edge fragments of a similar mould (2 pcs.)	andesite	intact, fragmented	Tumulus culture		<i>Barik 2011</i> fig. 4–5, 9–11.	
24.	Ciumești	Csomaköz	RO, jud. Satu Mare	settlement depot	moulds, 19 pcs.: socketed axes with handle, adze, razor, rings, pendants etc.	sandstone	intact, fragmented	Early Urnfield period, Ha A1		<i>Bader 1978</i> 123, Taf. 64; <i>Wanzek 1989</i> 200–201, Taf. 19. 4–6, Taf. 48. 2–4.	
25.	Culciu Mic	Kiskoles	RO, jud. Satu Mare	settlement	heart- or man-shaped pendant	unknown	parts missing	Felsőszécs horizon		<i>Bader 1978</i> 124, Taf. 46. 1.	
26.	Dăbăca	Doboka	RO, jud. Cluj	settlement	axe, 3 pcs.	unknown	fragmented, parts missing	B B2–D		<i>Gogăltan 2017</i> 18–21, fig. 4–7.	
27.	Dobanovci		SRB, opšt. Zumen	stray find	socketed axe	stone	intact (?)	Early Urnfield period, Ha A1		<i>Wanzek 1989</i> 197.	
28.	Dolný Kubín	Alsókubin	SK, okr. Dolný Kubín	settlement	socketed axe with handle	unknown	intact	Lausitz culture		<i>Čaplovic 1978</i> fig. 37. 6.	
29.	Dománesti	Domahida	RO, jud. Satu Mare	depot I.	socketed axe	sandstone (?)	intact	Opályi horizon, B IVb, Otomani III culture		<i>Mozsolics 1973</i> 81, 128–129, Taf. 27. 14a–b, Taf. 111. 6.	
30.	Dunajská Streda	Duna-szerdahely	SK, okr. Dunajská Streda	stray find	beads	unknown	no data	Urnfield culture		<i>Pichlerová – Tomčíková 2001</i> 118, 134, Abb. 4. 1.	
31.	Dumbeș bed (Almás-acszándy–Győr)		H, Győr-Ménfőcsanak-Sopron-Komárom-Esztergom m.	stray find	arrowheads	sandstone	parts missing	Tumulus/ Urnfield culture		Unpublished.	
32.	Eresi		H, Fejér	settlement	openwork pendant, winged and socketed axe with handle	unknown	fragmented, intact (2)	Late Urnfield culture		<i>Hampel 1880</i> 211–212, fig. 42–44.	
33.	Gáborján	Földvár	H, Hajdú-Bihar	ditch of a fortified highland settlement	dagger (2 pcs.)	sandstone, Parád/Hárshegy type	parts missing	Gáva culture, B D–Ha A1		<i>Dant 1999</i> 37–39.	

No.	Current name	Former name	Lands/parcel	Country, county, district	Site/find context	Object to cast	Material of the casting mould	State of the casting mould	Dating (period/culture)	Other metal-working finds	Literature	Notes
34.	Gelsesziget		Újadvári-Határ-dűlő	H, Zala	settlement, feature 4/a.	ring and arming	sandstone (?)	fragmented	Tumulus (B C2) or Urnfield culture (B D – Ha A)		Unpublished. <i>Ilton 2015b</i> Taf. 18. 1.	Description by L. Horváth in 2008. From the permanent exhibition of the Thury György Museum, Nagykanizsa.
35.	Georgiu	Alyogy	Kőalja hegy	RO, jud. Hunedoara	Kun Kocsárd-cave	Plattensibel mit gegossenen Endplatten Sebes type torque	stone	parts missing	Urnfield culture, Ha A2–B2–3		<i>Bader 1983</i> 39–41, Taf. 4. 23; <i>Rosta 1942</i> 15; <i>Moesolics 1973</i> 82.	
36.	Gomolova bei Hrtkovec		Gomolova	SRB, opš. Ruma	settlement, layer VII.	socketed axe	stone	parts missing	Early Urnfield culture		<i>Wanzek 1989</i> 197.	
37.	Gornja Radgona			SLO, obč. Gornja Radgona	settlement	socketed axes with handle, adze, spearheadhead, arrow, pins, openwork pendant, rings	unknown	fragmented	Late Urnfield culture		<i>Wanzek 1989</i> 197.	
38.	Gör		Kápolna-domb	H, Vas	settlement pits	axe, hammer, rings, spearhead, arrowhead, Keftiu ingot etc.	sandstone	intact, fragmented	Urnfield culture, Ha B1	ladles, ingot, slag	<i>Ilton 1992</i> ; <i>Ilton 1996</i> ; <i>Ilton 2003</i> ; <i>Ilton 2015b</i> Taf. 18. 7.	The results of the Keftiu ingot's analysis are published in T. Biró 1995.
39.	Háchiu (Brassó)	Höltövény/Heldsdorf		RO, jud. Sf. Gheorghe	settlement depot	6 moulds for 8–9 objects: hammer-axe, dagger, knife, fourfold-bulge necked pin, roundhead pin with stop-ridge, pin, lunula, 3 buttons, tongue-shaped rod	sandstone and slate/limestone (?)	fragmented	Noua/Wietenberg culture, SD I (= Beilage 14) = B C-D		<i>Hänsel 1968</i> 92, Taf. 56. 22–27, Beilage 14; <i>Rezi 2015</i> 18, 26, 32, 43, 104, 139, 174, 332, 341, 374–375, Taf. 24; <i>Sorocanu 2012</i> 44–45, Taf. 14.	Lost. <i>Rezi 2015</i> 138, 164.
40.	Hegyeshalom		Országúti-dűlő I.	H, Győr-Ménfőcsanak, Sopron	settlement, 2007/93. house	axe	sandstone	fragmented	Early Tumulus culture		<i>Aszt 2008</i> .	Modified dating of the finds during processing of the Bronze Age settlement by E. Mellis.
41.	Horné Plechtince	Felsőpalojta		SK, okr. Veľký Krtíš	settlement	arrowheads	unknown	intact	Late Pillyn culture		<i>Furmánek 1977</i> 257, Taf. XX. 2.	
42.	Idoš	Tiszahegyes		SRB, opš. Kikinda	stray find	socketed axe with handle	stone	fragmented	Late Urnfield culture		<i>Wanzek 1989</i> 197–198.	
43.	Ilava	Ilava		SK, okr. Ilava	burial	knife	stone	parts missing	Lausitz culture, Ha B1		<i>Chebenová 2012</i> 9, Taf. VII. 4; <i>Jochenhövel 2018</i> Table 1.	
44.	Karlovec			SRB, opš. Pećinci	stray find	axe	unknown	fragmented	Early Urnfield culture		<i>Wanzek 1989</i> 198.	
45A.	Keszthely		Apátdomb	H, Zala	settlement	axe, pins	unknown	fragmented	Urnfield culture		<i>Sági 1909</i> 342–354, fig. 5. 3; <i>Kőszegi 1988</i> 150.	
45B.	Keszthely		Elkerülő út	H, Zala	settlement pit	dagger	sandstone	fragmented	Tumulus culture, B C		<i>Ilton 2015b</i> Taf. 18. 10.	Excavation of R. Müller in 1994. Recorded based on a letter by J. P. Barna in 2008.
46.	Kladovo		Duna és Jakomirpatak torkolata	SRB, opš. Kladovo	stray find	axe	stone	no data	Early Urnfield culture, Zuto-Brdlo		<i>Wanzek 1989</i> 198.	
47.	Külösát		Egressy-dűlő	H, Veszprém	settlement (?)	rings	stone	intact	Tumulus/Urnfield culture		<i>Ilton 1995</i> 92, Taf. VIII. 7.	

48A. Lápuş	Magyarlápós		RO, jud. Maramures	Tumulus 11	axe	unknown	parts missing	SB 2, Felsőszécs-Gáva, Lápuş group		Kacsó 2001 239, Abb. 27. H11.
48B. Lápuş	Magyarlápós		RO, jud. Maramures	Tumulus 13	rod	stone	parts missing			Kacsó 2001 239, Abb. 27. H13.
48C. Lápuş	Magyarlápós		RO, jud. Maramures	Tumulus 16	socketed axe with handle (2 pcs.)	stone	fragmented			Kacsó 2001 239, Abb. 28. H16. 1-2; Jochenhofer 2018 268.
49. Lengyel		Sánc	H, Tolna	settlement	sickle, knife	unknown	parts missing	Tumulus/Urnfild culture		Patek 1968 Taf. 78. 15; Kőszegi 1988. 156, Taf. 8. G34.
50. Lontov	Lontó	U Litaşa	SK, okr. Levice	highland, fortified settlement	two sickles	sandstone	parts missing	Early Urnfild culture		Chebenová – Cheben 2019 2-4, 7-9, fig. 5, Pl. VIII. 1-2.
51. Lovas	Lovas		HR, opš. Vukovar	stray find	socketed axe with handle	stone	parts missing	Early Urnfild culture		Wanček 1989 198, Taf. 37. 4.
52. Makó		Imenső Jángor 3.	H, Békés	settlement, pit	socketed axe with handle	stone (?)	parts missing	Gáva culture		Hargitai – Sósokati 2012 93.
53. Medias (and area)	Medgyes		RO, jud. Sibiu	stray find	socketed axe with handle (2 + 1 pcs.)	stone	intact	Early Urnfild culture		Wanček 1989 201-202, Taf. 47. 1-3.
54. Mezőcsát		Hörségös	H, Borsod-Abaúj-Zemplén	settlement, pit 9.	socketed axe with handle	sandstone	parts missing	Gáva/Kyjatice culture, Ha A		Patek 1982.
55. Mezőlak		Szenpéteri-domb	H, Veszprém	from a grave from the Arpadian period	cased tool converted into a casting core	sandstone	parts missing	Urnfild culture		Ilon 1989 21, Abb. 7. 2.
56. Mikleuska			SRB, opš. Kutina	settlement	socketed axe with handle	clay	parts missing	Late Urnfild culture		Wanček 1989 198, Taf. 39. 4.
57. Mojzsovo	Ózdlőge		SK, okr. Nové Zámky	stray find	willowleaf-shaped pendant	sandstone	fragmented	Urnfild culture		Furmánek 1980b 68, fig. 34. 1.
58. Muhi		Kavcsbánya	H, Borsod-Abaúj-Zemplén	settlement	sickle, socketed axe, spearhead	sandstone	fragmented, intact	Gáva culture, Ha A1		Koós 2015 141-143, 148, 154, Pl. 16. 1-2, Pl. 17. 1, 3, Pl. 18-20.
59. Nagyerki		Szaheska	H, Somogy	settlement	socketed hammer	mica	no data	Urnfild culture		Darnay 1908 138-139, 142, Abb. 1.
60. Némethánya		Felsőerdei dűlő	H, Veszprém	mound III/4, grave 2	ring set	burnt clay, dolomite-tempered (?)	fragmented	Late Tumulus/early Urnfild culture, BD		Ilon 1989 18, 25, Abb. 6. 6; Ilon 2014 Taf. 8. 9.
61. Neszmedly		Felsősziget	H, Komárom-Esztergom	settlement, section 1, pit 2	socketed axe with handle	unknown	fragmented	Urnfild culture, Ha A2		Patek 1961 57, Taf. 28. 8.
62. Novigrad na Savi			SRB, opš. Slavonski Brod	settlement	socketed axe with handle, rings	stone	intact	Late Urnfild culture		Wanček 1989 198, Taf. 38. 3.
63. Nyíregyháza		Oros Ur-Csere	H, Szabolcs-Szatmár-Bereg	settlement, features 120 and 220.	shaft-tube axe, blade part of axe(?), socketed adze	unknown	parts missing	Berkesz horizon, BD		Bejinaric – Székely – Sana 2009 58, 67, Pl. XII. 2, XIV. 8.
64. Ormož	Ormosd		SLO, obč. Ormož	highland settlement	socketed axe	stone	no data	Urnfild culture		Wanček 1989 198-199.
65. Oyorhei	Fügyi-vásárhely		RO, jud. Bihar	stray find	spearhead, dagger, knobbed end sickle	sandstone	intact	Igria group – Urnfild culture		Hampel 1886 Taf. 2. 4-6; Darnay 1900 59; Mozsolics 1973 81.

No.	Current name	Former name	Lands/parcel	Country, county, district	Site/find context	Object to cast	Material of the casting mould	State of the casting mould	Dating (period/culture)	Other metal-working finds	Literature	Notes
66A.	Ozslár		Nyárfaszög	H, Borsod-Abaúj-Zemplén	settlement, feature 652.	pin	stone	fragmented	Egyek-Berkesz horizon, B C2-D		<i>Kalitz – Koós 1997</i> 68, 180, 26–31, Abb. 61–62; <i>Koós 2001</i> 222–223, Taf. 3. 1a–b, Taf. 3. 3, Taf. 3. 4, Taf. 3. 5 a–b.	
66B.	Ozslár		Nyárfaszög	H, Borsod-Abaúj-Zemplén	settlement, feature 477.	spearhead, with rods, lumula and beads or nuts on the backside	sandstone	intact	Egyek-Berkesz horizon, B C2-D – Ha A1	feature 219; crucible; feature 477; whetstone	<i>Kalitz – Koós 1997</i> 68, 180, 26–31, Abb. 61–62; <i>Koós 2001</i> 222–223, Taf. 3. 1a–b, Taf. 3. 3, Taf. 3. 4, Taf. 3. 5 a–b; <i>Koós 2013</i> .	
67.	Pécs		Makártető/Makár-hegy	H, Baranya	settlement	knife, axe, socketed axe with handle, pendant	sandstone, clay	intact	Urnfield culture	crucible	<i>Bíró – F. Péter – Maráz – Maráz 1979</i> 121, 157; <i>Jankovits 2017</i> 249, Taf. 83, 3052.	
68.	Piliny		Borsoshegy	H, Nógrád	settlement	axe, miniature axe, dagger, razor, rods(?)	unknown	intact, fragmented	Piliny culture, B IV		<i>Hampel 1886</i> Taf. 3. 2, Taf. 4. 2; <i>Mozsolics 1973</i> 81, Taf. 110, Taf. 111. 1–4; <i>Kemenzsei 1984</i> 106; <i>Kovács 1986</i> Abb. 3. 1.	
69.	Pobedim	Pobedény		SK, okr. Nové Mesto nad Váhom	settlement	sickle, pins (3 pcs.), knife	sandstone	intact, fragmented	Lausitz culture		<i>Novotná 1980</i> 184, Taf. 53, 151–1513; <i>Furmánek – Veličák – Pladár 1991</i> 226, fig. 38, 9; <i>Furmánek – Novotná 2006</i> 47, Taf. 12, 285–286; <i>Chebenová 2012</i> Taf. VI. 2.	
70.	Polgár		M3 Site 1	H, Hajdú-Bihar	settlement	socketed axe with handle, spearhead, swordblade part, buttons, rings	sandstone	intact, parts missing, fragmented	Classical Gáva culture, Kurd horizon		<i>V. Szabó 2004</i> 148, Abb. 8. 2–4.	
71.	Poroszló		Aponhát	H, Heves	settlement	pin, socketed axe with handle, hilt fragment of sword or dagger	unknown	fragmented	Gáva culture, Ha A2	two ladles	<i>Patay 1976</i> 200–201, Abb. 4. 2, 7.	
72.	Prasník	Prasnik-irtvány		SK, okr. Priešťany	highland settlement	knife	unknown	intact	Late Bronze Age		<i>Chebenová 2012</i> 9, Taf. VI. 3.	
73.	Prügy		Tököföld	H, Borsod-Abaúj-Zemplén	settlement	socketed axe	unknown	no data	Gáva culture		<i>Kemenzsei 1984</i> 161; <i>Wanzek 1989</i> 203.	
74.	Poian	Kézdi-szentkereszt		RO, jud. Covasna	stray find	axe	stone	intact	Late Bronze Age		<i>Wanzek 1989</i> 202, Taf. 49, 3.	
75.	Radzovce	Ragyolc		SK, okr. Lučenec	settlement	sword, daggers, funnel pendants, rod, hammer(?), sickle	sandstone	intact (tutul), fragmented	Piliny culture		<i>Furmánek 1977</i> 257; <i>Furmánek – Veličák – Pladár 1991</i> fig. 38; <i>Furmánek – Novotná 2006</i> 47, Taf. 12, 287.	
76.	Regály		Földvár	H, Tolna	settlement, pit 3/B	socketed axe with handle	unknown	intact	Urnfield culture		<i>Patek 1968</i> Taf. 81. 12; <i>Kőszegi 1988</i> 175, Taf. 8, F33.	
77.	Reci	Réty	Telek	RO, jud. Covasna	settlement	edge fragment of an axe	stone	parts missing	Late Bronze Age (?)		<i>Szekely 1959</i> 197, fig. 6, 6; <i>Wanzek 1989</i> 202.	
78.	Şagu	Németség		RO, jud. Timis	site A 1.1, settlement, features 25, 66, 182, 184, 193, 194, 198.	axes, rods or armrings(?)	clay, sandstone	intact, parts missing, fragmented	B D – Ha A1, Kurd horizon	slags	<i>Sova – Hurezan – Marginean 2011</i> 52–55, fig. 92–95, fig. 104.	
79.	Sármellék		Száraz-eleje	H, Zala	settlement, pit: 10, 23, 93, 104	socketed- and winged axe, pendant, armring (?)	sandstone	fragmented	Late Tumulus/Early Urnfield culture, B D/Ha A1	slags	Unpublished.	Excavation of I. Eke in 2021.
80.	Sárvár		Faképi dűlő	H, Vas	settlement	socket fragment of a tool with a ring on the backside	sandstone	fragmented	Late Tumulus/Early Urnfield culture, B D/Ha A1		<i>Ilton 2015b</i> Taf. 18. 11.	Excavation of P. Kiss in 2004.

81.	Siklós								unknown	no data	Early Tumulus culture		<i>Mozsolics 1973</i> 81, note 8.
82.	Softvadkert	Büdöstó						arrowhead	sandstone, rhyolite tuff	intact, some broken in two	Early Tumulus culture, Koszider horizon or Classic and Late Tumulus – Early Urnfield culture (B C/D – Ha A1)		<i>Gazdapuzsztat 1959</i> 268–276, Taf. II–IX; <i>Mozsolics 1973</i> 80–81, Taf. 108–109; <i>Péteri 2004</i> 504, 513, fig. VIII. 1, VIII. 4; <i>Hámsel 2011</i> ; <i>Nessel 2019</i> 809.
83.	Sáncicolau Mare area							socketed axe with handle	stone	fragmented	Late Bronze Age		<i>Wanček 1989</i> 202, Taf. 49, 7.
84.	Simleu Silvaniei							pendant	steatite/soapstone	intact	Urnfield culture		<i>Jankovits 2017</i> 240, Taf. 80, 3022.
85.	Somlyó/Somló-hegy							rod (?)	unknown	no data	Urnfield culture (?)		<i>Darnay 1900</i> 31.
86A.	Somotor							socketed axe	stone	intact	Late Urnfield culture		<i>Wanček 1989</i> 196.
86B.	Somotor							socketed hammer	unknown	no data	Gáva culture		<i>Hansen 1994</i> II. 594/504.
87.	Sopron	Pozmann-dűlő						socketed hammer	stone	no data	Urnfield culture, Ha A – B1		<i>Polgár 2013</i> 74–75, Abb. 2, Abb. 4.
88.	Sveti-Petar	Ludbreški						socketed axe with handle (5 pcs.), socketed axe, adze (2 pcs.), knife (2 pcs.), small head set	clay	intact, parts missing	Late Urnfield culture		<i>Wanček 1989</i> 199–200, Taf. 35–36, 37, 1–2.
89.	Szarvas							sperhead/adze (?)	unknown	parts missing	Gáva culture, Ha B1		<i>MRT 8</i> 476, Taf. 27, 4.
90.	Szécsény							pendant	unknown	no data	Piliny culture, B D – Ha A1, Kurd horizon		<i>Jankovits 2010</i> 50; <i>Jankovits 2017</i> 252, Taf. 87, 3098A–B
91.	Szeged-Szőreg C	Sáv utca						16 moulds: willowleaf-shaped pendant, rippled arming, cauldron handle, spearhead, socketed hammer, nits etc.	sandstone, soapstone	parts missing, fragmented	Gáva culture, Ha B1		<i>Mozsolics 1985</i> 196–197, Taf. 273–274; <i>P. Fischl 2000</i> Abb. 20–21; <i>V. Szabó 2004</i> 148, Abb. 5, 1–7; <i>Jankovits 2017</i> Taf. 78, 2974.
92.	Szombathely							rod (?)	sandstone (?)	fragmented	Tumulus/Urnfield culture transition(?)		Unpublished. Excavation of Mária Károlyi, Gábor Bándi, Mária Fekete. 1981.
93.	Tátság							socketed axe with handle	unknown	fragmented	Gáva culture		<i>Wanček 1989</i> 202, Taf. 49, 2.
94.	Tatabánya	Dózsakert						socketed adze, pin	sandstone	intact	Urnfield culture, Ha A1, 4 urn burials with bronze objects and pottery		<i>Vékony – Cseh 2001</i> 167; <i>Mészáros 2012</i> 7, 28–29, 38, 70, 76–77.
94.	Tatabánya	Dózsakert						socketed axe	sandstone (?)		Urnfield culture, Ha A1		<i>Mészáros 2012</i> 31, 34, 37–40.
													Tatabánya Museum Inv. no. 2010.1.42.2. In the description only one mould is mentioned from feature 8.



No.	Current name	Former name	Lands/parcel	Country, county, district	Site/find context	Object to cast	Material of the casting mould	State of the casting mould	Dating (period/culture)	Other metal-working finds	Literature	Notes
95.	Teleac	Telek/Telekfalva/Új-esongvatelek	Ságrétek (S-9 út/III. lh.)	RO, jud. Alba	settlement depot	4 pcs.: socketed axe, socketed axe with small ring set and pendant(?), rippled arming, 'plant-shaped object'	sandstone (?)	parts missing, fragmented	Ha B1 - C	tuyere, raw material (aseucite)	<i>Ciugudean – Luca – Georgheni, 2008</i> 43–44, Pl. XXIII. 1, 4; <i>Ciugudean 2015</i> 14, fig. 2, 1–2, 5; <i>Nessel 2017</i> .	
96.	Tolna-Műzs		Ságrétek (S-9 út/III. lh.)	H, Tolna	settlement, feature 718.	large ring or pendant (2 pcs.)	unknown	no data	Urnfield culture			Recorded from a temporary exhibition in 1999.
97.	Trencsén	Trencsén	Istebnik	SK, okr. Trenčín	settlement	rod (?), pins	clay, sandstone	fragmented	Early Lausitz culture	tuyere	<i>Kujovský 2004</i> 370, Abb. 2, 6, 9.	
98.	Várkölyg		Nagyfáz-hegy, Bazaltbánya	H, Zala	settlement	swordblade, spearheads (2 pcs.), axe, pin, ring	clay, sandstone	fragmented	Urnfield culture	crucibles, raw materials	<i>Mozsolics 2000</i> 88–89; Müller 2007 13; <i>Müller 2018</i> 85, fig. 2, 16a; <i>Ilon 2015b</i> Taf. 18, 3–5.	
99A.	Vát		Bodon tábla	H, Vas	settlement, pit 199.	ingot	graphite green slate	intact	Urnfield culture		<i>Ilon 2015a</i> 60, fig. 33, 3–4; <i>Ilon 2015b</i> Taf. 18, 8.	
99B.	Vát		Telekes-dűlő	H, Vas	settlement, pit 39.	pins (?)	sandstone	fragmented	Tumulus culture		Unpublished.	
100.	Velem		Szent Vid	H, Vas	settlement/stray find on excavation	socketed axes with handle, adze, rings, pins, sickle, rods, beads	sandstone	intact, fragmented	Urnfield culture	crucibles, corepieces, raw materials	<i>Miske 1908</i> Taf. XXII–XXVII; <i>Bárány – Fekete 1984</i> 106, fig. 9; <i>Fekete 2013</i> Taf. II, 1; <i>Ilon 2015b</i> Taf. 18, 2, 6, 9, 12; <i>Ilon 2018a</i> ; <i>Ilon 2018</i> .	
101.	Vinkovci/Vinkovec		Tržnica	HR, Vukovarsko	tell settlement	battle-axe (Mozsolics 1967 Ac-B1a type), heart-shaped pendant, scale	clay	fragmented	Beleğiş I, MD II/III, B B2-C1		<i>Ložnjak Dizdār 2013</i> 65–66, Pl. 1, Pl. 3.	
102.	Visegrád		Dió	H, Pest	settlement, sections I–III.	unknown	clay	fragmented	Tumulus culture, B C		<i>Mali 2018</i> 59, Pl. 2, 7.	
103.	Vyšná Pokoradz	Felső-pokoragy		SK, okr. Rimavská Sobota	settlement	razer	stone	intact	Piliny culture, Ha A1		<i>Furmánek 1977</i> 257, 297–298, Taf. XXXVII, 5–6.	
104A.	Vyšný Kubín	Felsőkubín		SK, okr. Dolný Kubín	cemetery	more than 13 pcs.: published knives, needles, hammer, two-piece mould of a socketed axe with handle, sickles	sandstone	intact, fragmented	Lausitz culture	core	<i>Kubinyi 1883</i> 279–284; <i>Novotná 1980</i> 184, 186, Taf. 53, 1514–1515; <i>Furmánek – Novotná 2006</i> 47–48, Taf. 13, 290–291; <i>Jockenhövel 2018</i> Table 1.	
104B.	Vyšný Kubín	Felsőkubín	Tupa-Skala	SK, okr. Dolný Kubín	stray find, fortified Ha-period settlement	knife	sandstone	parts missing	Lausitz culture		<i>Chebenová 2012</i> 9, Taf. VI. 1.	
105.	Zagyvaszántó		Sósomb	H, Heves	settlement	miniature dagger	stone	intact	Piliny culture		<i>Kemenzsei 1984</i> 108, Taf. 13, 28; <i>Kovács 1986</i> Abb. 3, 2.	
106.	Zalaszentiván		Kisfaludi-hegy	H, Zala	settlement	spearhead, socketed axe/hangers (?)	unknown	intact	Urnfield culture		<i>Bóna 1958</i> 236, 241; <i>Mozsolics 1967</i> 101; <i>Százaz 2017</i> 3, fig. 4; <i>Százaz 2020</i> 390, Taf. 1, 6–8.	Excavation of Cs. Százaz in the Zalaegerszeg-Csásas-Pethőhénye reservoir project. Recorded based on her letter in 2008.

Table 3. Late Bronze Age casting moulds of the Carpathian Basin (Croatia: HR; Hungary: H; Romania: RO; Serbia: SRB; Slovakia: SK; Slovenia: SLO)

