



The First ‘Urnfields’ in the Plains of the Danube and the Po

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Abstract

Archaeological research is currently redefining how large-scale changes occurred in prehistoric times. In addition to the long-standing theoretical dichotomy between ‘cultural transmission’ and ‘demic diffusion’, many alternative models borrowed from sociology can be used to explain the spread of innovations. The emergence of urnfields in Middle and Late Bronze Age Europe is certainly one of these large-scale phenomena; its wide distribution has been traditionally emphasized by the use of the general term *Urnenfelderkultur/zeit* (starting around 1300 BC). Thanks to new evidence, we are now able to draw a more comprehensive picture, which shows a variety of regional responses to the introduction of the new funerary custom. The earliest ‘urnfields’ can be identified in central Hungary, among the tell communities of the late Nagyrév/Vatya Culture, around 2000 BC. From the nineteenth century BC onwards, the urnfield model is documented among communities in northeastern Serbia, south of the Iron Gates. During the subsequent collapse of the tell system, around 1500 BC, the urnfield model spread into some of the neighbouring regions. The adoption, however, appears more radical in the southern Po plain, as well as in the Sava/Drava/Lower Tisza plains, while in Lower Austria, Transdanubia and in the northern Po plain it seems more gradual and appears to have been subject to processes of syncretism/hybridization with traditional rites. Other areas seem to reject the novelty, at least until the latest phases of the Bronze Age. We argue that a possible explanation for these varied responses relates to the degree of interconnectedness and homophily among communities in the previous phases.

Keywords Urnfields · Middle/Late Bronze Age · Diffusion of innovations · Homophily · Early adopters

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Introduction

During the second millennium BC, robust networks covered a vast region that comprised the two plains of the Po and the Danube, and the mountain areas of the three ‘metallogenic provinces’ of the Eastern Alps, Balkans and Carpathians, involving communities with different customs, traditions and material cultures. Judging from the explosion of bronze production during this period, the circulation of metal was probably the precondition for flourishing interactions (Gavranović & Mehofer, 2016; Jung et al., 2011; Ling et al., 2019; Mehofer et al., 2021; Pernicka et al., 2016; Radivojević et al., 2018; Vandkilde, 2016).

The distribution of specific materials nonetheless indicates that some of the corridors connecting the various parts of this wide territory were already established by the Late Copper Age and the Early Bronze Age, at least by the late third/early second millennium (Cardarelli et al., 2020; David, 2016; Kiss, 2012a). The *Brotlaibidole* (‘loaf-of-bread idols’, *tavolette enigmatique*), for instance, are distributed in the Po–Garda area (Polada Culture) along the upper–middle Danube/northern Carpathian Basin (Mad’arovec, Encrusted Pottery culture), and in the lower Danube area at the Serbian/Romanian border (Žuto Brdo–Gârla Mare culture; Battisti, 2015; Ettl, 2011; Palincaş, 2012).

The existence of close connections between distant areas raises questions about the geopolitical scenario in which Bronze Age stratified societies and networks flourished. Although the presence of cultural/political mediators had to be fundamental, affinities in the socio-economic structures and ideological system among partners likely facilitated the flow of tangible and intangible capital along pre-existing corridors.

Social-network theoreticians have adopted the term *homophily* to define preferential relationships among similar entities, following the principle that contacts between similar people/groups occur at a higher rate than among dissimilar subjects (McPherson et al., 2001; Rogers, 2003; see also Drost & Vander Linden, 2019). Ideas and technologies are transmitted through social connections, and more effective communication occurs when source and receiver are homophilous and share common meanings, attitudes and beliefs. In a kind of feedback loop, this communication then leads to ever greater homophily in knowledge and behaviour.

Helle Vandkilde, writing about the spread of transcultural warriorhood between the Carpathian Basin and the Nordic cultures during more-or-less the period considered here (c. 1600–1500 BC), alludes to the same concept, albeit not explicitly: ‘A common ground in social organization [...] would presumably facilitate a more complete transfer of tangible and intangible novelties’ (Vandkilde, 2014, p. 604; see also Risch & Meller, 2015, p. 250).

The funerary ritual represents one intangible aspect of culture that we can analyse in a comparative perspective in order to highlight the times, modes, and nature of the relationships in this area of Europe around the second half of the second millennium BC, although these might not be as straightforward as other types of material evidence. In this phase, cemeteries with large numbers of urn

cremations begin to appear outside the Danube–Carpathian Basin, in a change to the long-held tradition of inhumation, or the custom of non-urned cremation.

The *urnfield*, as a descriptive rather than cultural category, identifies a typical funerary aspect of the Bronze Age and emerges in some parts of Europe significantly earlier than the beginning of the *Urnenfelderzeit* (c. 1300 BC). Over-simplifying, and taking the early examples documented in Hungary into account, it took roughly one thousand years before this model became well established throughout the continent, sufficiently normative and standardized to be considered a supra-regional cultural trait.

The earliest examples of urnfields in the area under consideration can be found in the Carpathian Basin, where this new and complex way of treating and disposing of the dead tends to be juxtaposed with and/or replace the traditional flat inhumations, primary cremations ('in situ cremations'), or scattered cremations from at least the twenty-fifth century BC. However, it is during the first half of the 2nd millennium BC—and more intensively around the sixteenth–fifteenth centuries BC—that the urnfield custom crosses its original boundaries and starts to be intensively practised in other regions, or isolated sites still surrounded by communities practising other kinds of funerary ritual. To what extent the spread of the urnfield model is the result of cultural transmission rather than (at least partially) a demic diffusion can be debated, but unfortunately not easily verified, since cremation destroys DNA and therefore the identification of any population movement via aDNA analysis. Beside the ideological aspects, the new biomolecular evidence of virulent pathogens, most notably *Yersinia pestis*, found in individuals dated to the 3rd and 2nd millennia BC, from Central Asia to Central/Northern Europe (Andrades Valtueña et al., 2017; Rasmussen et al., 2015; Spyrou, 2018; Rascovan et al., 2019), suggests that the diffusion of certain epidemics, especially in densely populated and well-interconnected regions, might have triggered practical responses by societies attempting to limit transmission. The burning of corpses may be one of these.

What appears clear from the current archaeological evidence is that the neighbouring regions maintained a range of attitudes towards the exogenous innovation, spanning from radical acceptance to gradual introduction, or from hybridization to complete rejection (see also Falkenstein, 2012, p. 329; Rebay-Salisbury, 2012, p. 21).

In this paper we analyse the archaeological and—wherever possible—osteological evidence related to this complex phenomenon of diffusion between the plains of the Danube and the Po (Fig. 1), focussing on the pre-*Urnenfelderzeit*, namely the central and final phases of the Middle Bronze Age, Bz B2–Bz C in Central European chronology. In the next paragraphs, we will (a) propose a definition of the 'urnfield package', a series of essential and optional traits that characterize this burial custom; (b) track the earliest examples that match our model in the Middle and Lower Danube regions and the Central Po plain, analysing the most significant and best-documented archaeological contexts, for which osteological data are also available; and (c) draw conclusions about regional attitudes towards the novelty and dynamic of cultural transmission in light of theoretical frameworks for the diffusion of innovations.

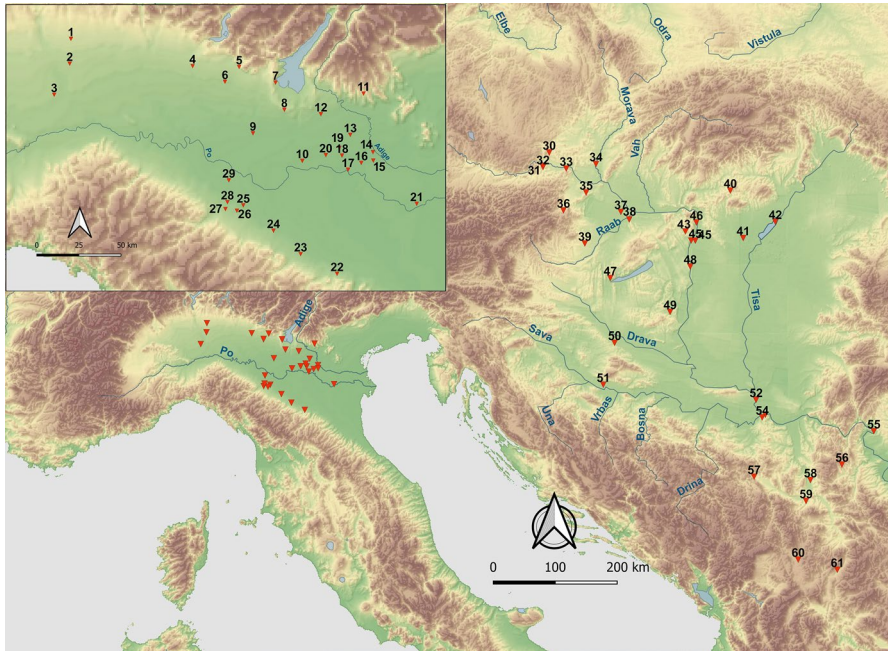


Fig. 1 Sites mentioned in the text.: (1) Canegrate; (2) Scamozzina; (3) Gambolò; (4) Uragio d'Oglio; (5) Brescia-ex convento Santa Chiara; (6) Capriano del Colle; (7) Lavagnone; (8) Monte Lonato-Cavriana; (9) Sorbara d'Asola; (10) Virgilio-Pietole; (11) Arano Cellore; (12) Povegliano Veronese; (13) Bovolone; (14) Scalvinetto; (15) Franzine Nuove; (16) Castello del Tartaro; (17) Vallona di Ostiglia; (18) Gazzo Valserà; (19) Olmo di Nogara; (20) Roncoferraro; (21) Canar; (22) Pragatto; (23) Casinalbo; (24) Montata; (25) Beneceto; (26) Sant'Eurosia; (27) Vicofertile; (28) Fraore; (29) Copezzato; (30) Baierdorf; (31) Franzhausen; (32) Inzersdorf; (33) St. Andrä; (34) Stillfried; (35) Sommerein; (36) Pitten; (37) Mosonszentmiklós; (38) Győr-Ménfőcsanak; (39) Szombathely-Zanat; (40) Salgótarján-Zagyvapálfalva; (41) Jánoshida; (42) Tiszafüred; (43) Biatorbágy; (44) Százhalombatta; (45) Szigetszentmiklós; (46) Békásmegyer; (47) Keszthely; (48) Dunaújváros; (49) Bonyhád; (50) Virovitica; (51) Gredani; (52) Stojića gumno; (53) Karaburma; (54) Kaluđerске livade; (55) Glamija; (56) Trnjane; (57) Prijedor; (58) Paraćin; (59) Hajdučka česma; (60) Brnjica; (61) Vranje-Meanishte

The 'Urnfield Package': Definitional Criteria

The 'urnfield package' encompasses a series of traits, which are mainly related to the funerary ritual and to the social criteria of inclusion/exclusion listed in Table 1. Although it is not our intention to speculate on their possible meanings in terms of symbology, ideology or cosmology, their adoption and repetition might be caused by a strong religious agency and/or socially normative force (e.g. Collar, 2007; Williams, 2004).

The package is not rigid; its local reinterpretation may adopt some elements and exclude others. In this classification, we therefore consider some traits *essential* (especially those that might appear obvious), and others *optional* (Table 1).

The transmission of the urnfield package does not involve the adoption of new specific artefact types. The forms and the technology of the objects remain tied to

Table 1 List of criteria taken into account for the definition of the ‘urnfield package’

<i>Ritual criteria</i>	
1. Use of a container for the deposition of cremated bones (usually, but not necessarily, a ceramic vessel specifically made for funerary purposes)	Essential
2. Washing/selective collection of bones before deposition (no charcoal/pyre ashes put in the urn)	Optional
3. Disposal of cremated bones in ‘anatomical order’, or at least with skull fragments on top of the bone assemblage	Optional
4. Placement of the urn/container in a pit	Essential
5. Frequent reduction/exclusion of grave goods (especially weapons) from the burial	Essential
<i>Socio-demographic criteria</i>	
1. General tendency to be largely representative of the living community, with frequent exclusion of perinatal and/or young children (less than 2–3 years old)	Essential
2. In cemeteries, use of distinct burial groups as expression of social membership	Optional

local traditions. However, this does not rule out the sporadic occurrence of similarities (e.g. in urn or grave good typologies) among the different geographic and cultural contexts considered here. Similarities might plausibly be explained as being a consequence of the mobility of single individuals or small groups for whom the expression of a different origin by using objects typical of the birthplace was socially acceptable. An alternative explanation is the circulation of goods/prototypes.

The circulation of artefacts, technologies and ideas, determined by direct contacts, does not necessarily follow the same pathways, since some groups might be permeable to trade of goods and commodities for utilitarian reasons, but impermeable to the diffusion of new ideas and customs, which are traditionally considered a more conservative aspect of cultural identity (see Vandkilde, 2014, pp. 604–605; Collar, 2007).

The Prelude to the ‘Urnfield Package’ Expansion: Burial Customs in the Central Carpathian Basin Between Bz A2 and Bz C

At the beginning of the second millennium BC, after earlier periods with cremation burials dating to the Hungarian Early Bronze Age (Kulcsár, 2009, 2011), the cremation rite was already dominant in western and central Hungary (Fischl et al., 2013; Zoffmann & Hajdu, 2017) after an experimental phase with a few in situ cremations among communities such as the Nagyrév, the ancestors of the Vatyá Culture (e.g. Szőreg, Grave 193) and the earliest Transdanubian Encrusted Pottery Culture (also called Kisapostag style; e.g. Bonyhád) (Hajdu et al., 2016) (Fig. 2).

The central part of Hungary, the area of the Vatyá Culture, shows the presence of larger ‘urnfields’ such as Dunaújváros-Duna-dűlő, with up to 1600 graves probably from the late Nagyrév period (Vicze, 2011, pp. 50–52). The cemetery forms an arc covering the entire western side of the Dunaújváros-Kosziderpadlás tell settlement, and is spatially organized by boat-shaped groups of graves, likely to reflect extended families or kinship units (Vicze, 2011). Here we can see the typical form of the urn

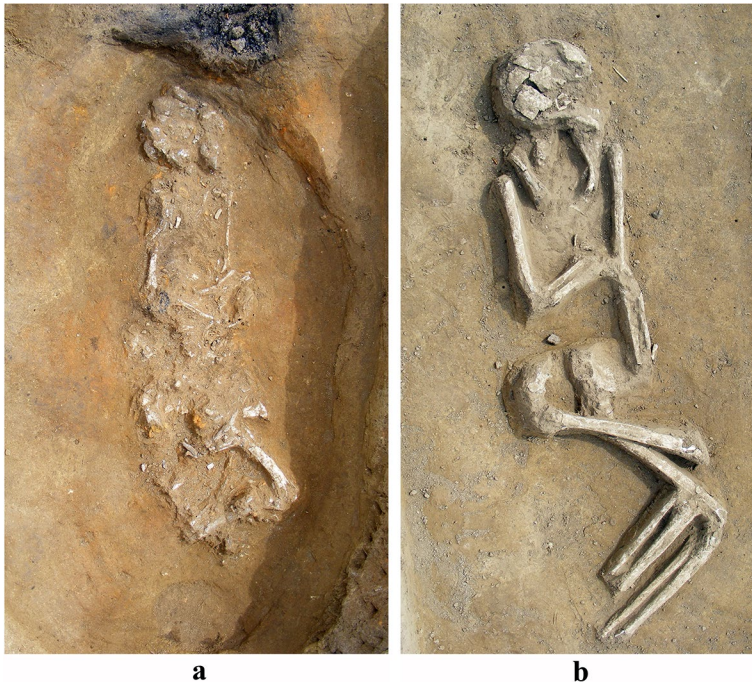


Fig. 2 In situ cremation burial 85 (on the left) and inhumation 180 (on the right) from the cemetery of Bonyhád (earliest phase of Transdanubian Encrusted Pottery culture) (after Szabó & Hajdu, 2010, fig. 3a–b)

burial with the cremated remains inside a big vessel, covered by one or two bowls, and, rarely, with stones. In most cases, a small cup was placed inside the urn or next to it (Fig. 3). Deposition of (burnt or unburnt) metal finds in 10–20% of burials in most of the cemeteries, usually ornaments and small tools in graves of male and female individuals, signals higher social status. Around 2% of the burials can be interpreted as those of high-status leaders equipped with bronze weapons and their female relatives ornamented with gold jewellery (Dani et al., 2016; Szeverényi & Kiss, 2018). In the earliest phases of the cemetery (2200–1700 BC), burials seem to be relatively rich in metals, whereas from the Vatyá III phase (1700/1600 BC), quantities tend to decrease rapidly (Vicze, 2011, pp. 80, 119, 124; Dani et al., 2016, pp. 229–231, fig. 10). Concerning secondary/complementary rituals, the practice of respecting the anatomical order when placing cremated bones into the urns was documented at Dunaújváros, with the lower limb bones at the bottom and the skull on top (Vicze, 2011, p. 54).

Human remains were not preserved from the largest cemetery, excavated during rescue excavations at Dunaújváros in the 1950s. Demographic analysis of other Vatyá burial places, however, demonstrates that the cemetery population usually consisted of roughly equal numbers of males and females, sometimes with a slightly higher proportion of women, and 20–30% or even more infants and juveniles (Zoffmann, 2011, pp. 38, 55). The larger proportion of women is sometimes interpreted



Fig. 3 Reconstruction of an urn burial of the Vatyá culture, covered by stone slabs (Vicze, 2003, fig. 20)

as congruent with the assumption that burials without human remains (cenotaphs) belong to warrior males who died and were buried outside the home territory. It may, however, be the result of a methodological problem with identifying males during the anthropological analyses of cremated remains (Cavazzuti et al., 2019a, 2019b). No bones were found in six out of 21 urns excavated at the cemetery of Százhalombatta-Alsó Szőlők (Poroszlai, 1990; Sørensen & Rebay-Salisbury, 2008, p. 59).

The osteological analysis of 73 individuals from Szigetszentmiklós-Felső-tag late Nagyrév/early Vatyá cemetery shows the following proportions: 32 individuals between 0 and 14 years at death (42%), nine of whom were 3 years old or younger (12%), 38 juveniles and adults (52%), and 3 undetermined (4%) (Kalicz-Schreiber, 1995; Zoffmann, 1995, tables I–IV).

The cemetery at Biatorbágy yielded detailed osteological data from the early phase of the Vatyá Culture. Despite the poor preservation of the graves, 77% (88 graves) of 115 burials included human bones and 27 burials (23%) were possibly

cenotaphs, with no trace of human remains (Mali, 2014, p. 24). From a demographic perspective, the sex ratio is close to 1:1 and the percentage of sub-adults is 31%, while the ratio of children under 3 was 4.5%. Thirty-one burials (26%) contained bronze grave goods, mainly in association with children (under the age of 10) and female adults (aged 20–40). The relatively high number of metal grave goods is characteristic of the Vatyá I phase (2000/1900 BC). Only three male burials contained bronze weapons (daggers), while women were accompanied by ornaments; both symbolize status (Mali, 2014, pp. 38–39, 46; Szeverényi & Kiss, 2018). Bronze ornaments, especially bracelets, frequently accompanied the burials of children between one and four years of age in Biatorbágy and Szigetszentmiklós (Kalicz-Schreiber, 1995; Mali, 2014, p. 38; Melis et al., 2020, p. 99, fig. 7.4). Sub-adults without bronze objects were underrepresented in Biatorbágy, which raises the question of whether children of lower social status were not buried within the boundaries of the communal burial ground (Mali, 2014, pp. 45–46). Vatyá contexts exhibit all essential criteria of the ‘urnfield package’: lidded urns as containers for depositing the cremated bones, the placement of the urn in a grave pit, the tendency to reduce metal grave goods over time, the demographic representation of the entire living community, and the use of burial groups to express social membership. Vatyá burial groups usually consist of 18 to 20 graves, whereas grave groups 1 to 11 comprised from 100 to 200 graves each at Dunaújváros-Duna-dűlő (Vicze, 2011, p. 29–33).

Multiple and single pit inhumations also appear in the archaeological record from the formative phase until the Koszider period (Koszider period: c. 1600–1500/1450 BC), although they are rare (Earle et al., 2012, fig. 7; Szeverényi et al., 2020).

In cemeteries with Transdanubian Encrusted Pottery, urn cremations are less frequent (c. 250 burials) than scattered cremations (c. 480 burials), although still well represented. Urns may be found in small pits, while scattered cremations, equipped with a dozen or more vessels, are placed in oval or rectangular pits, slightly smaller than body size (Sørensen & Rebay-Salisbury, 2008; Kiss, 2012b, pp. 229–238). Burnt or unburnt bronze ornaments are occasionally found among the ashes, either scattered around or gathered into small piles (Kovács et al., 2019; Szabó, 2012). Miniature vessels and large pots are often part of the burial. A clear example of the variety that characterizes Transdanubian Encrusted Pottery funerary sites is the cemetery of Mosonszentmiklós (1700–1500 BC), which includes 22 scattered cremations, 31 urn burials and 22 burials without human remains, five of which were undisturbed. The latter may be interpreted as symbolic graves or cenotaphs, possibly reflecting deaths outside the home territory (Kiss, 2012b; Uzsoki, 1963).

Another key site of the same cultural sphere is Bonyhád, with 184 graves dating from 2150 to 1500/1450 BC (Szabó, 2017). Here, the transition from one rite to the other is clearly visible, as inhumations are the norm in the first phase (c. 2150–1900 BC) while cremation gradually tends to prevail after c. 1900 BC. Again, the cremation ritual is interpreted in two different ways: urn burials number 29, scattered cremations 113, and in situ cremations are represented by two interesting cases (Szabó, 2010, 2012; Kiss et al., in press). Burial 84 displays the in situ cremation of a 14–16-year-old individual’s bones deposited in anatomical order, and only a few pieces seem to have been moved. The 10–13-year-old individual in Grave 85 was also cremated in situ (Fig. 2). The body was deposited in a supine position, with

slightly flexed legs tilted to the side. The body was cremated in this position, and since its anatomical order was well preserved, it suggests that only a small part of the pyre was under the body. It is even possible that the whole pyre was built over the body (Hajdu et al., 2016).

As cremation proliferates, bronze grave goods decrease significantly in the later phase of Transdanubian Encrusted Pottery (Bz A2b–c), in parallel with the appearance of hoards (Kiss, 2009; Dani et al., 2016, pp. 232–233; Hajdu et al., 2016). According to several observations, metal finds, symbolizing status, are found in only 10–20% of the burials. All age groups received bronze ornaments, except the oldest adults (mature or senile individuals; Kiss, 2009, fig. 5; Kiss, 2012b, p. 254, figs. 82, 83). Based on osteological data, the percentage of buried sub-adults ranged from 30 to 45% (Zoffmann, 2011, pp. 34–36). In Mosonszentmiklós the proportion of children under 5 years was remarkably low (12.5%) (Zoffmann, 1971). The ratio of babies (under 1 year) spans 0–3% in the analysed cemeteries of the Transdanubian Encrusted Pottery Culture (Zoffmann, 2015, Table 6). In the multiple cremation burials, the co-burial of an adult and a child under 4 years was noticeably frequent (Zoffmann, 2015, table 4; Melis et al., 2020, pp. 91–94). In summary, infants (under 3–4 years) were represented in the cemeteries of the Transdanubian Encrusted Pottery Culture, but their ratio is much lower than the expected child mortality; however, the exclusion of these young children from the communal burial ground cannot be declared with certainty, considering the poor preservation of the bones in the scattered cremation burials.

Based on the current state of research, Transdanubian Encrusted Pottery cemeteries do not appear to contain as many buried individuals. Although it has been estimated that they may have included several hundred graves, the largest cemeteries, Bonyhád and Győr-Ménfőcsanak, contain only 184 and 170 unearthed burials, respectively. Regarding the ritual criteria defined above (Table 1), the disposal of bones in ‘anatomical order’ has not been observed in Encrusted Pottery contexts (Hajdu, 2010; Köhler et al. in press), except for a few cases observed several decades ago at Mosonszentmiklós (Uzsoki, 1963, pp. 6–7). The urn, as a container for depositing cremated bones, can be found in the whole distribution area (Fig. 4a), but scattered cremations are more common. Sometimes multiple burials show the coexistence of different rites (Fig. 4b). The washing or accurate selection of bones can be assumed based on the lack of charcoal/pyre remains. It is possible that the ashes/human remains were wetted down to speed up the cooling process; this may have facilitated the cleaning up of surviving bones and thus their more thorough collection (Szabó, 2004; Fülöp & Váczi, 2016; Fülöp, 2018, Fig. 14). The enucleation of burial in groups, sometimes with burials placed in rows, is recognisable in well-documented cemeteries and probably expressed social membership and/or kinship ties (Kiss, 2012b, pp. 240–241, 257, fig. 84).

Subsequently, during the early phases of the Late Bronze Age in Hungary (c. 1500–1300 BC), materials of the Tumulus culture became widespread in the Carpathian Basin. The typical graves of this phase from western Hungary are well represented by the 15 tumulus burials from Keszthely-Sömögyei-dűlő. Here, the deceased were laid to rest in a supine position with bronze swords of the Boiu-Keszthely type, daggers and seal-headed pins. The correlation between

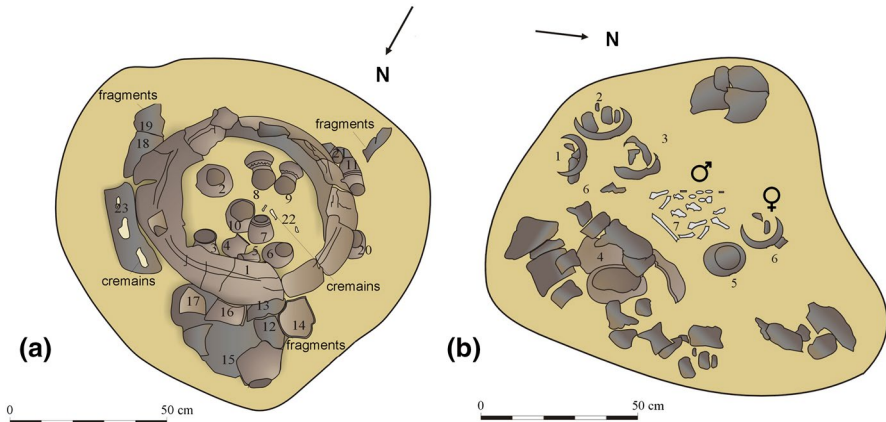


Fig. 4 **a** Urn burial n. 42; and **b** double cremation burial n. 186 (Encrusted Pottery Culture). The cremated bones of a male were scattered while the cremated bones of a female were placed in an urn (after Hajdu et al., 2016, fig. 4)

the Danubian Bronze Age and the Terramare north of the Po River is well documented by the dense distribution of Sauerbrunn and Boiu type swords (Kemenczei, 1988; Neumann, 2009).

In eastern Hungary, several larger cemeteries are known from the period (e.g. Jánoshida, Tiszafüred). The cemeteries of this period (after c. 1500 BC) are characterized by inurned and scattered cremation graves and inhumation burials (Csányi, 2003, 2017; Fülöp & Váczi, 2014, 2016; Guba, 2015; Kovács, 1975). Comparing the ratio of inhumation to cremation burials with data from Middle Bronze Age burial grounds in the Carpathian Basin, some authors suggest that this ratio reflects the extent to which local population groups and supposed newcomers integrated and formed a new culture (Csányi, 2017; Hajdu, 2008, 2012).

For example, the bi-ritual cemetery at Jánoshida, assigned to the Tumulus culture, revealed a total of 278 burials, whereas the cemetery of Salgótarján-Zagyvapálfalva from the same period, with 607 urn graves, is assigned to the Piliny culture and interpreted as representing the descendants of the autochthonous Middle Bronze Age (Hatvan) community. At Salgótarján, the urn burials contained large pieces of cremated bones with no trace of charcoal, probably due to washing of the bones; several vessels were put in the burials, sometimes covered by large pieces of stone (Guba & Vaday, 2008, 2009; Köhler et al. in press). In comparison, at Jánoshida the number of inhumations (children inhumed in *pythoi*) and cremations (mainly scattered) is almost equal. A few burials contained bronze and gold grave goods, but the vast majority of inhumations were systematically robbed; cremation burials, by contrast, were left untouched, maybe as a consequence of their original 'austerity'. Based on determinable cases of inhumations, male and female burials are equal in number, while childhood mortality appears strikingly high (65%; Csányi, 2003, 2017; Hajdu, 2008, 2012). The variability of burial rites suggests a lack of the standard criteria defined as the 'urnfield package'.

Urnfields *sensu stricto* appear in the subsequent phase (Bz D), showing rather standardized characteristics: urn cremations are dominant and usually contain a few hundred grams of cremated bone. Available data of the period from recently published cemeteries excavated at Budapest-Békásmegyér (324 individuals, 70% scattered cremation and 30% urn burial) and Szombathely-Zanat (64 individuals, urn cremations are dominant) suggest nearly equal numbers of male and female burials, and variable rates of childhood mortality (Budapest-Békásmegyér: 17%; Szombathely-Zanat: 37–40%) (Heußner, 2010; Köhler & Polgár, 2011; Tóth, 2011).

The Central Po Plain and the Terramare System: Different Districts, Different Burial Rites

During the Early Bronze Age (Bz A), the central part of the Po plain was largely occupied by the communities of the Polada Culture. Their intense contacts with the areas northeast of the Alps (Gáta–Wieselburg, Unterwölbling and Mad'arovec, above all) are highlighted by the distribution of a wide set of materials, such as specific types of bronze objects, ceramics and *Brotlaibidole* (e.g. de Marinis et al., 2015). Striking similarities are documented in the ceramic assemblage at Canàr and other contexts in northeastern Italy with Gáta–Wieselburg pottery (Bellintani, 1987; Cupitò & Leonardi, 2015; de Marinis & Valzolgher, 2013; de Marinis et al., 2015; Peroni, 1971).

Close affinities in funerary customs might suggest a shared system of beliefs, which appears to enjoy close continuity with the Bell Beaker tradition. Single inhumations with the dead deposited in flexed position and orientated according to sex are indeed documented both at Polada sites (Arano, Sorbara di Asola, Gazzo Valserà), and among the Unterwölbling or Maros groups (de Marinis & Valzolgher, 2013, p. 552; Reiter, 2008, p. 122). Burial 22 at Arano Cellore is currently the only example of a cremated body for the whole Early Bronze Age in this area (Salzani et al., 2015, p. 291). The first urnfields instead appear substantially later, during the fifteenth century BC, within the Terramare culture.

From the seventeenth to the twelfth century BC, the Po plain is the setting for the historical cycle of the Terramare (Bernabò Brea et al., 1997; Cardarelli, 2009). The initial phases, until 1500 BC, see the foundation of new sites already provided with typical defensive structures, such as ditch and embankment. Nonetheless, the relatively few cemeteries, such as Olmo di Nogara, Povegliano Veronese and Monte Lonato, that include graves dated with certainty to this early phase in the Middle Bronze Age (MBA 1–2) are located exclusively north of the Po, between the Oglio and Adige rivers, an area that was also part of the Polada Culture in the earlier phases. The norm here is flat inhumation with the dead in supine position, frequently accompanied by grave goods such as bronze ornaments and weapons (in ~30% of cases), most notably swords of the Boiu-Sauerbrunn (or Boiu-Keszthely) type (Cupitò, 2006; Salzani, 2005). By contrast, among the Emilian Terramare south of the Po River, seventeenth–sixteenth century burials have not been found so far, despite the significant presence of settlements. It is likely that the bodies of the deceased were treated in such a way as to leave no

trace in the archaeological record; scattered cremation is a plausible hypothesis, though only weakly supported by the single instance of a few cremated bones in a ditch at Santa Rosa di Poviglio (Cardarelli, 2014, pp. 859–860).

Starting from 1550 to 1500 BC, the archaeological record shows an exponential increase in the number of sites, which—as has been repeatedly argued—can hardly be explained simply in terms of internal growth (Bettelli et al., 2004, p. 336; Cardarelli, 2009, p. 467). This suggests that groups of people penetrated the area much more intensively than before, completing the ‘colonisation’ process that began about a century earlier. The exponential growth occurs synchronously or, at most, slightly earlier than the adoption of the urnfield model, though with different dynamics in the two districts of the Terramare area.

North of the Po River, large necropolises, such as Bovolone, Scalvinetto, Castello del Tartaro, Vallona di Ostiglia, Franzine Nuove, Povegliano and Olmo di Nogara include both inhumations and urn cremations in different proportions (David-Elbiali, 2010; Salzani, 2005). Flat single inhumations seem the exclusive burial option during the Italian MBA2 (c. 1550–1450 BC); urn cremations are introduced during MBA3 (c. 1450–1350 BC), tend to exceed inhumations at the beginning of the Recent Bronze Age (RBA; 1350/1300 BC), and become almost exclusive in the course of the RBA (c. 1350/1300–1150 BC; Baratella & Cupitò, 2015; de Marinis & Salzani, 2005). We can therefore propose that the adoption of the urnfield model among the northern Terramare was *gradual*. At Franzine Nuove, for instance, urn cremations were found above and below inhumation burials (Aspes & Fasani, 1961).

In rather well-preserved cemeteries, the horizontal stratigraphy seems to confirm this view. At Scalvinetto (Terramara at Fondo Paviani; 748 burials), earlier inhumations are dispersed in the western part of the funerary area, while urn cremations aggregate in distinct groups, which tend to occupy the eastern part (Fig. 5). In the central portion, the admixture between the two groups may indicate the transitional period.

Cemeteries of the northern Terramare also provide intriguing insights into the ideological changes that accompanied the transition from one rite to the other. Osteological analyses carried out on more than a thousand burials from Scalvinetto, Olmo di Nogara and Franzine Nuove have found that children under the age of 2–3 years, including fetuses and newborns, are well represented among inhumations and almost totally absent among cremations (Canci et al., 2015; Cavazzuti et al., 2015; Corrain et al., 1984; see also Vanzetti & Borgognini Tarli, 2003).

A further discrepancy is the substantial changes in grave good assemblages. At Olmo di Nogara (533 burials), for example, a high percentage of the earlier inhumations have grave goods (40%), including bronze swords (32.6% of the adult males; de Marinis & Salzani, 2005, p. 416); this frequency tends to decrease significantly in urn cremations (5% of the individuals), which did not include weapons.

All evidence from northern Terramare cemeteries points to three main conclusions: (1) the adoption of the urnfield model in this area started around 1450/1400 BC and was gradual; (2) people practising the two rites were part of the same communities, using the same burial space; (3) the ‘inhumers’ and ‘cremators’ displayed not only rather different, almost opposite, views of death and afterlife, but also

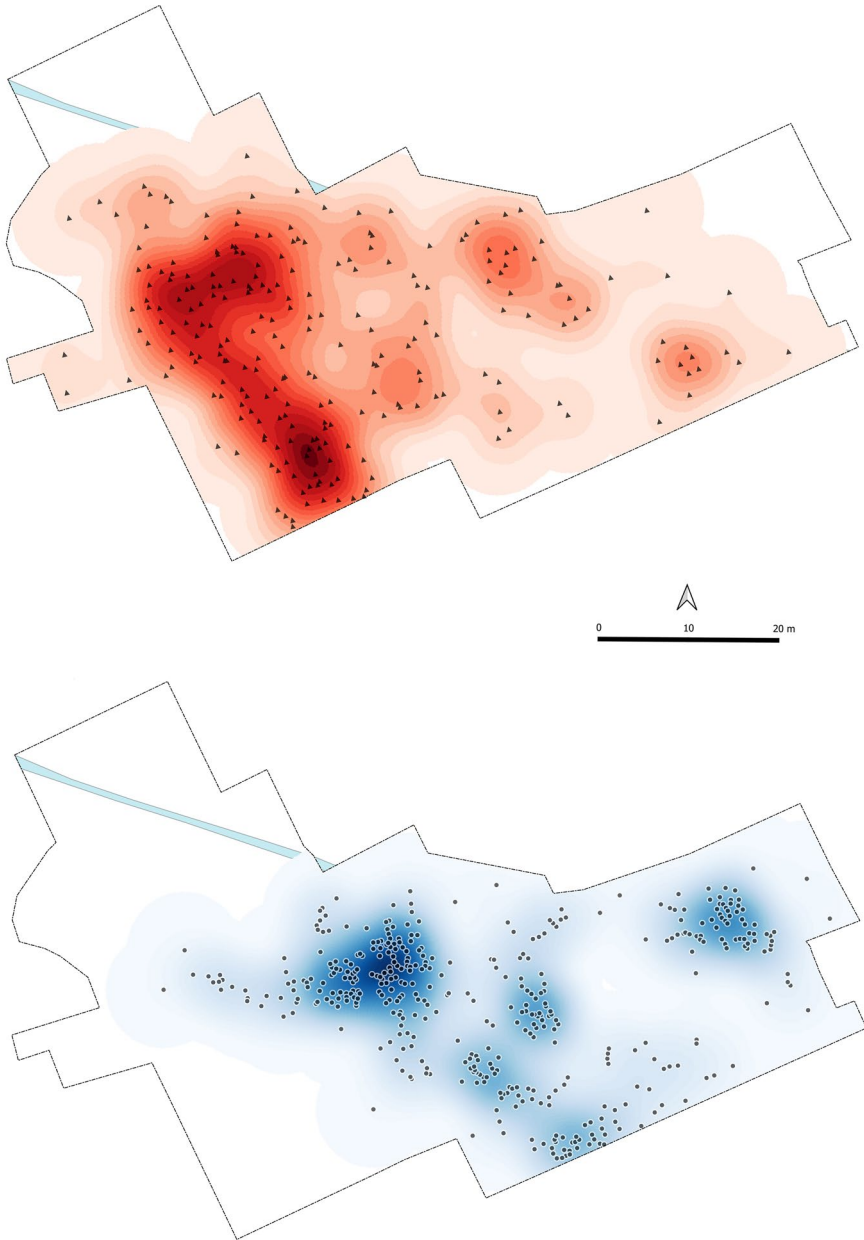


Fig. 5 Map of the cemetery at Scalvinetto, Fondo Paviani with kernel density of inhumations (black filled triangle) and cremations (black filled circle). Inhumations are mostly concentrated in the western part of the excavated area (red) and the ‘urnfield’ unfolds towards the east (blue) (Colour figure online)

marked ideological differences in their attitudes towards the exhibition of personal status, as well as in their conception of children's position in society.

The Terramare, situated on the southern part of the Po plain, conversely, are characterized by the exclusive use of urn cremation. Pragatto, Montata, Beneceto, Copezzato, Vicofertile (Bernabò Brea et al., 1997; Bronzoni et al., 2012; Ferrari & Mutti, 2018), and above all, Casinalbo, which provides the largest archaeological and osteological dataset (674 excavated graves, 349 analysed and published) are amongst the most notable urnfields (Cardarelli, 2014; Cavazzuti & Salvadei, 2014). According to typo-chronology, stratigraphy and radiocarbon dates, the cemetery of Casinalbo spans the period from the MBA2–MBA3 transition (c. 1450 BC) to the RBA2 (c. 1150 BC) (Fig. 6). Burials clearly cluster in separate groups of different size, from a few graves up to 86 (Fig. 7), probably reflecting extended families, judging from the age and sex distribution. Similarly to the northern Terramare

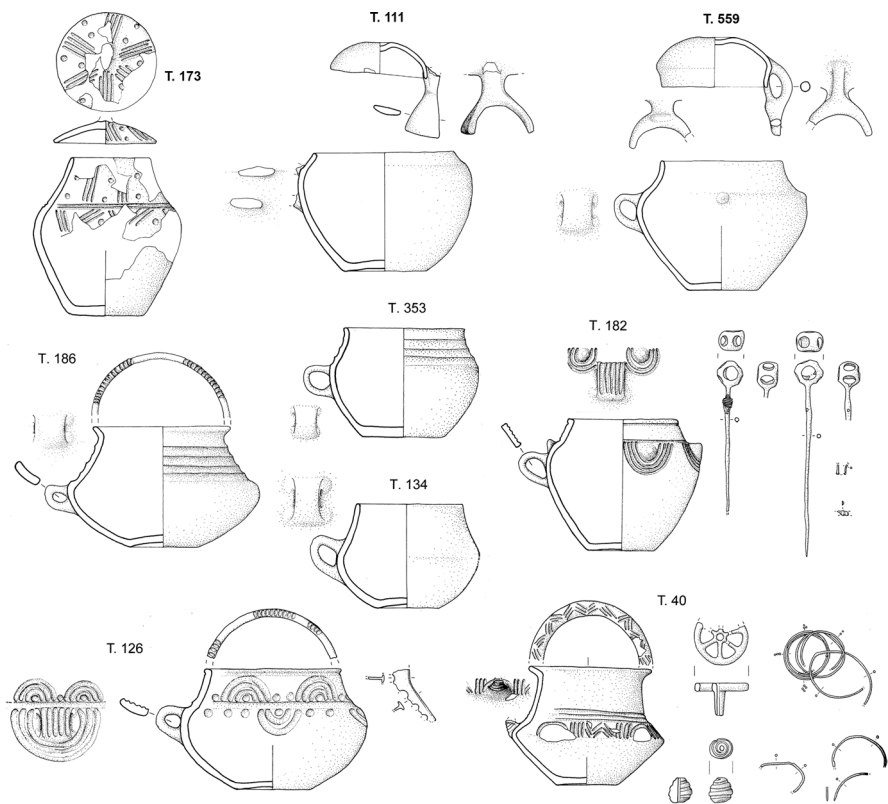


Fig. 6 Nine urns and grave goods from Casinalbo urnfield (courtesy of the Museo Civico Archeologico Etnologico di Modena). Burial nos. 111, 126, 134, 186 and 353 are dated to the advanced phase of the Italian Middle Bronze Age (1450–1325 BC), while nos. 40, 173, 182 and 559 are dated to the Recent Bronze Age (1325–1150 BC); 1:8 original size. Interestingly, the two pins of burial no. 182 (1:4 original size) show striking similarities with a pin found in Libákovice hoard (Czech Republic) (Kytlicová, 2007, taf. 9B.6) (drawings by Gianluca Pellacani)



Fig. 7 A burial group at Casinalbo urnfield during the 2003 excavations; large river pebbles mark the presence of an urn or a group of urns below the ground (courtesy of the Museo Civico Archeologico Etnologico di Modena)

urnfields, children under the age of 2–3 were excluded from cremation and were probably treated in a different way. Some were probably inhumed inside the *terramara*, near the houses, as the evidence of buried foetuses from Fraore suggests (Cavazzuti & Salvadei, 2014, p. 701). For all the other age classes, the ritual was considerably standardized. Cremated bones were collected from the pyre, washed, separated from the pyre residue, and finally arranged in anatomical order (or at least with the skull fragments on top) into a ceramic urn. Some of the urns were covered by a ceramic lid (bowl or cup) before the final deposition in a pit. In eight cases the urn was probably of organic material (Fig. 8). Only one possible ‘cenotaph’ is documented (burial n. 157) and five urns, all attributable to adult individuals, contain less than 53 g of cremated bones, namely approximately 3% of the expected weight. These cases have been compared to other examples known from literature and interpreted as ‘symbolic’ burials (Cavazzuti & Salvadei, 2014, pp. 679–680; see also Liston, 2007, pp. 64–65; McKinley, 2009, p. 85; Gambari & Venturino, 2012, pp. 308, 315).

Grave goods were found in 16.5% of the urns; in most cases they were bronze or bone/antler ornaments associated with female or subadult (probably female) individuals. However, bronze spots were observed on cremated bones in 49 urns (14% of the overall number) with no trace of grave goods present. They are therefore interpreted as the result of the presence of bronze goods on the pyre (see also McKinley, 1994). To support this interpretation, pyre goods such as swords, daggers and ornaments were indeed found in pieces (in some cases semi-melted), intentionally deposited in a specific area of the cemetery, associated with fragments of a large jar and several jugs/bowls likely used for libations (Cardarelli et al., 2006, 2014, pp. 90–108). The area was interpreted as a place for collective ceremonies in honour of the deceased.



Fig. 8 Grave no. 406 from Casinalbo urnfield during the excavations; the urn was probably made of organic materials (courtesy of the Museo Civico Archeologico Etnologico di Modena)

In conclusion, Casinalbo and the other Emilian Terramare urnfields show that:

1. the introduction of the urnfield model can be dated around 1450 BC;
2. despite the considerable number of burials (over a thousand), there is no evidence of rites other than urn cremation and no trace of ritual hybridization/contamination;
3. as all the Emilian urnfields strictly match the criteria mentioned above, we conclude that the adoption of the model in this region is *radical*.

The central-western Po plain north of the Po River, corresponding to present-day Lombardy, is characterized by the exclusive use of urn cremations, at least from the Middle Bronze Age 2–3 (c. 1500/1450 BC) (de Marinis & Salzani, 1997; David-Elbiali, 2010). In eastern Lombardy, urnfields such as Monte Lonato-Cavriana, Virgilio-Pietole, Fenili Belasi-Capriano del Colle, Brescia-ex convento di S. Chiara, and Urago d'Oglio include a variable number of cremations (normally under a hundred) (de Marinis & Salzani, 1997; Simone Zopfi, 2003, 2005a, 2005b). Despite the differences in the overall ceramic typology, the ritual appears rather similar to that of the Terramare: weapons are almost totally absent from the graves and bones were washed before the final deposition in the urns. Unfortunately, the scarcity of osteological analyses prevents further observations regarding rituals and socio-demographic estimations.

The urnfields situated in western Lombardy, such as Gambolò and Scamozzina, show an analogous custom. We can nonetheless detect small differences, especially in the attitude towards the deposition of weapons. During the first phases, daggers and swords are documented in few cases, while female jewellery sets are more frequent (Simone, 1990, 1992; Castelfranco, 1891, 1909). Starting from the Recent

Bronze Age (1350 BC), the deposition of weapons slightly increases, but seems still limited, as at Monza and Canegrate (Castelfranco, 1891; Rittatore Vonwiller, 1953, 1956).

Lombardy, therefore, seems characterized by a radical acceptance of the urnfield model in the eastern part, in closer contact with the Terramare area, while to the west and in the more recent phases some of the essential traits, especially the custom of excluding weapons from the grave goods, appear to diminish.

In the Piedmont area, a gradual introduction of the urnfield model has been observed (Gambari, 2004; Rubat Borel, 2020). The analysis of ceramic and bronze typology, integrated by few radiocarbon dates, seems to indicate that the transition between inhumation and urn cremation took place around 1450 BC.

Eastern Austria: From Experimentation to Standardisation

Early Bronze Age cemeteries in Lower Austria, dating from c. 2200 to 1600 BC, include a small number of cremated individuals (Reiter, 2008), but cremation was by no means a widespread ritual. Most cremations at Franzhausen, for example, can either be dated as very early and explained as part of the Bell Beaker and Corded burial ritual, or dated late, at the transition to the Middle Bronze Age. One such grave is the burial of a 25–40-year-old pregnant woman at Franzhausen II (Feature 3078; Neugebauer, 1999, p. 487) in a simple, amphora-shaped urn with two bronze bracelets. The urn was deposited in a simple pit of round to rectangular shape.

During the Middle Bronze Age (Bz B1–C2, c. 1600–1300 BC), funerary rites changed and began to include both inhumations and cremations. Single, double and multiple interments under burial mounds and the deposition of large bronze objects testify to a concern with the expression of social status. The relatively small number of Middle Bronze Age graves, however, suggests that only the upper social strata are archaeologically visible. Large and ostentatious bronze ornaments are typical; examples include over-long and heavy dress pins, necklaces, diadems and belts. Men's weapons include short swords, daggers and axes (Neugebauer, 1994; Probst, 2011; Urban, 2000).

The largest, best-preserved and best-recorded cemetery of the Middle Bronze Age is Pitten in Lower Austria (HAMPL et al., 1985). Pitten is situated in a hilly, fertile landscape between the Austrian Alps and the Hungarian plain. Approximately 221 documented graves detail how the transition to cremation unfolded in a small community south of the river Danube. Burial forms show a considerable element of variability and experimentation as the primary mode of burial shifted from inhumation to cremation. Seventy-five individuals were inhumed, while 154 were cremated. There is a general chronological trend from a low percentage of cremations in the first and second phase of the cemetery, to cremation as a dominant rite in the third phase and an exclusive rite in the last phase at the cemetery. The change from inhumation to cremation was not, however, a unilinear or straightforward process. A number of examples show that temporally, inhumation and cremation overlapped, and the interplay gave room for complex social negotiations. Cremation was thus not

simply adopted, but worked through carefully by the community of Pitten, experimentally and conceptually (Sørensen & Rebay, 2008).

Cremated bodies at Pitten were usually left *in situ*, that is, with the burnt skeletal elements still relatively ordered and overlying the fuel debris from the pyre. Burial Mound 5, for example, covered the remains of a pyre, with the cremated remains of a female oriented northwest–southeast, accompanied by a pair of pins. The body of a mature male individual was placed parallel to the cremated remains, but oriented southeast–northwest, reflecting the gendered body placement practised by Early Bronze Age communities south of the Danube. This deposition follows the same principle as the double inhumation graves in other mounds. The cremated body therefore continued to be perceived in orientation terms in the same way as an inhumed body.

In situ cremations were found with dress elements and jewellery matching the correct body regions. Grave 110, for example, was found with two pins in the shoulder region, a finger ring in the middle body region, and pottery at the head end and at the side of the body. This is similar to what we observed at Bonyhád cemetery in Transdanubia (see above), and again supports the idea that the cremated body was still perceived and treated as a whole corpse.

The practice(s) by which the cremated remains were gathered and placed in pits or containers (such as urns), suggests that those involved understood them to have become a different kind of entity or substance. Such practices are much rarer at Pitten than elsewhere. Two of the seven cremations in pits were found directly at the location of the funerary pyre. The final deposition thus still occurs at the same place as the cremation itself, but a new understanding of the body developed. At Pitten, such collections of cremated remains are usually low in weight—a token representation inside the urn, rather than the entire set of remains, seems to have sufficed for funerary deposition.



Fig. 9 Urn burial 163f at Pitten (Hampel et al., 1981: pl. 76, 160), © Landessammlungen Niederösterreich

Grave 163f, the cremation of a 40–60-year-old male deposited in an urn, is an interesting case. The cremated remains weigh more than 1000 g, are unusually representative, and were found in an urn tightly closed with a bowl (Fig. 9). The urn burial is stratigraphically the lowest of nine burials in a large burial mound, which dominates the southern part of the cemetery of Pitten, and has been dated to the earliest phase of the cemetery. It includes no bronze artefacts, but two cups and a bowl in addition to the urn and the lid. In this burial, we see the fully developed and articulated urn burial concept at the same time as hybridisation and experimentation were taking place at Pitten.

The cemetery population has a roughly even distribution of males and females, and subadults (infants plus juveniles) make up 47% of the population. The lowest proportion of cremated individuals is found amongst 7–14-year-olds, followed by 14–20-year-olds. By contrast, among the five babies under one year old from the cemetery, four were cremated. This is significant, as it is precisely these subadult age groups for which a social characterisation is perhaps still in the course of being defined and where it may have been especially important to visually reflect that through funerary ritual. This is done via placing and staging an inhumed body in the grave (Sørensen & Rebay, 2008, p. 158). The percentage of cremated women over the whole cemetery duration is slightly higher than that of men (58% and 43% respectively). This seems to be linked to the increase in the ratio of women in the later phases, during which cremation becomes dominant (Sørensen & Rebay, 2008, p. 159).

The ditch surrounding burial mound 153 included an inhumed and a cremated individual most likely deposited in close succession. Both were equipped with a ceramic vessel, the cremated child also with a bronze bracelet. Even young children were buried with valuable and symbolic grave goods at Pitten. Grave 154b, for example, included a 4–5-year-old with a dress pin and miniature dagger (Rebay-Salisbury, 2020). In conclusion, the Pitten cemetery shows that rites gradually changed from inhumation to cremation. Cremation did not arrive as a rigid ‘package’ of formulated ideas and ideals, but was one element of the complex of funerary rites to experiment with. Cremations continued to share characteristics with inhumations in terms of grave architecture, placing of bodies and artefacts, as well as post-funerary rituals at this cemetery. The variability of burial rites and grave forms at Pitten remains striking. Although the cemetery represents several steps in the development towards urnfields, it does not reach the standardisation and uniformity seen in Late Bronze Age cemeteries of the *Urnenfelderkultur*.

The first urnfields of the middle Danube Urnfield Culture, which extends over Lower Austria, Moravia, southwest Slovakia, parts of western Hungary, Burgenland and Styria, date to the thirteenth century BC (Bz D). Baierdorf (Lochner, 1986), a site giving rise to the name Baierdorf-Velaticé Group, comprised a small group of at least seven graves, three of which included swords (a Reutlingen sword, a fully-hilted Riegee sword and a Terontola sword presumed from the Po valley). From better-documented urnfields such as Horn (Lochner, 1991) and Inzersdorf (Fritzl, 2017) we know that, although the construction of burial mounds is largely given up, traditional elements such as rectangular or oval, body-sized grave constructions, and the practice of scattering the cremated remains within

the grave pit, remain common in the early phase of the Urnfield Culture. Some graves, e.g. Horn, Grave 14 (Lochner, 1991; Lochner in press), include pyre debris along with the scattered cremations, but this custom disappears at the point when bones are selectively collected and deposited enclosed in urns. Grave goods, too, persist, and richly equipped graves may contain a large number of ceramic vessels, weapons, bronze jewellery and dress elements, knives, and animal bones as remnants of meat offerings.

In the Čaka Group, extending from southwestern Slovakia and northern Burgenland to western Hungary, burial mounds with in situ cremations under burial mounds persisted until the group merged with the Baierdorf-Velatices Group in the twelfth century BC. The burial mounds revealed high-status grave goods, including Bronze Age sheet armour and weapons (Točík & Paulík, 1960). The burial mound from Sommerein was built over a stone cist made of sandstone slabs, which were engraved with symbols representing the sun and a Bronze Age hour-glass shield. Seven ceramic vessels, a bronze lance head, a pin and a knife were found inside the cist (Kaus, 1991).

It is not before the twelfth century BC (Ha A) that the criteria for the 'urnfield package' were truly met: scattered cremations gave way to the deposition of selected cremated remains in an urn (the total number of bones recovered from each grave makes a token deposit most likely); the urns were placed in a pit, which was round and just large enough for the urn and perhaps a few small, accessory vessels; and there was a significant reduction in the number of grave goods deposited with the cremated remains.

The cemetery of Inzersdorf (Fritzl, 2017) comprised 273 graves, of which 21 contained more than a single individual. The anthropological assessment of 247 assemblages of cremated remains classified 84 as children between birth and six years at death; 33 between the ages of 7 and 12; 19 between 13 and 19 years; and 111 as adults (Renhart, 2017). More detailed information on the age of sub-adult individuals is forthcoming. The very high proportion of sub-adults at Inzersdorf, however, suggests a full demographic representation, even if some of the sub-adult remains are fragmentary and included in adult graves in small amounts. It is difficult to tell whether such inclusions were intentional, or resulted from using a common cremation pyre, from which small amounts of cremated remains of different individuals were picked up accidentally. Twelve graves were surrounded by shallow circular and rectilinear ditches; other than that, there are no visible groupings within the cemetery area. Whereas the oldest graves with scattered cremations in rectangular to oval grave pits are well-equipped with grave goods, in particular large sets of ceramic vessels, fewer and fewer grave goods were included in the later phases at Inzersdorf. Remnants of jewellery and dress elements that were cremated with the dressed body, such as pins, necklace, bracelets, rings and rivets, are routinely found. Bronze knives, together with animal bones and bowls, are evidence of food and drink intended to accompany the dead; pottery sherds suggest feasts at the grave sites.

Cemeteries that date late in the urnfield period (tenth/ninth centuries BC), such as Sr. Andrä (Eibner, 1974), Stillfried (Strohschneider, 1976) and Franzhausen-Kokoron (Lochner & Hellerschmid, 2016), show a high degree of standardisation,

with all criteria of the urnfield package being met. The cemeteries include large numbers of cremated individuals, but contemporaneous depositions of unburnt bodies in pits within the confines of settlements also occur. The deposition of seven individuals, adults and children, of whom some were genetically related, are discussed as part of a ritual act (Hellerschmid, 2015; Parson et al., 2018).

The Western and Central Balkans: Between Radical Adoption and Radical Rejection

The increased use of cremation as burial rite occurs in the area between the Danube, Morava valley and Adriatic coast by the end of the 3rd millennium BC. During this early period, strong regional preferences characterize the deposition of cremated remains, forms of grave architecture and the intensity of the adoption of cremation. Absolute dates from sites of the Somogyvár-Vinkovci group in the southern Carpathian Basin indicate that burials in urns with lids and no grave goods were introduced between the twenty-fifth and the twenty-fourth century BC (Kalafatić, 2006, p. 24; Črešnar & Teržan, 2014, p. 665). The Somogyvár-Vinkovci urn burials, however, lack extensive graveyards, with most of the finds being singular graves (Kalafatić, 2006, p. 23; Kulcsár, 2009, fig. 47). In this respect, one of the essential criteria mentioned above—a largely representative selection of the local demographic composition—is clearly missing.

During the 25th–24th and subsequent centuries, cremation appears occasionally among some groups in the mountainous area of the western Balkans, including Belotić-Bela Crkva (Garašanin, 1983a; Kulcsár, 2009), Glasinac (Čović, 1983), and Cetina in the Adriatic hinterland (Marović, 1991). A common trait of these groups is the use of burial mounds as primary grave monuments and the absence of ceramic containers for cremated remains. Instead, the remains were scattered, deposited in a pit, or enclosed with stone slabs upon which the burial mound was erected. Recently obtained radiocarbon dates of burials from western Serbia (Belotić-Bela Crkva group) suggest the coexistence of inhumation and cremation, with the oldest scattered cremation graves from Krstac 95 and Lučani (Dmitrović, 2016, p. 110) dating to between the twenty-fourth and twenty-third centuries BC (Bulatović et al., 2020, fig. 11). In western Serbia, the tumuli often included larger burnt features described as pyres, which were incorporated into the grave monument (Dmitrović, 2016). Also specific for western Serbia is the long-term use of mounds as burial places with both inhumations and cremations throughout several centuries (Nikitović et al., 2002). According to the dates from the tumulus in Prijedor near Čačak (western Serbia), with a pit containing human remains, charcoal and stone representing the primary grave in the tumulus (Stojić & Nikitović, 1996), cremations without containers continued to be used in this area until the twenty-first–twentieth centuries BC (Bulatović et al., 2020, fig. 11).

An example of the early adoption of cremation as an exclusive burial rite, but again without a container, is the cemetery of Meanište in the southern Morava valley (Bulatović, 2016). Rescue excavations brought to light parts of the necropolis with 25 graves with human remains deposited in shallow pits and usually associated with

several smaller vessels and occasional river pebbles. The graves mostly contained just smaller amounts of cremated remains and by no means all parts of the body. What is specific to the case of Meanište is the covering of grave pits with circular stone constructions (1–2 m in diameter) and circular stone ring enclosures around graves (Bulatović, 2016, fig. 3). Based on a number of characteristic pottery shapes, Meanište was dated to the Early Bronze Age, which was later confirmed by absolute dates set between the twenty-first and nineteenth centuries BC (Bulatović, 2016; Bulatović et al., 2020, fig. 9).

Among the earliest urn cemeteries in the western and central Balkans are the burial places in northeastern Serbia, placed regularly in the immediate vicinity of settlement sites with traces of copper smelting activity (Kapuran, 2014). The recently obtained series of radiocarbon dates strongly suggests the period between the nineteenth and seventeenth centuries BC as the most probable time frame for both settlements and corresponding cemeteries (Gavranović & Kapuran, 2021; Kapuran et al., 2020; Mehofer et al., 2021). The dates from two neighbouring sites, Trnjane and Hajdučka česma, were obtained both from cremated bones and remains of the pyre (charcoal) with insignificant deviations between them, thus providing a strong argument for the validity of the dating. All hitherto discovered cemeteries in northeast Serbia reveal comparable structures with urns placed in the central part of the circular stone construction of a diameter between 2 and 4 m (Fig. 10). Grave goods are rare and include spindle whorls, smaller vessels and only rarely bronze objects, found within the urn or just next to the container (Kapuran et al., 2020). According to the first results of the anthropological analysis from the sites Trnjane, Krivaljski Kamen and Hajdučka česma, all age groups appear to be represented, with a somewhat higher ratio of juveniles and infants (Kapuran et al., 2017; Kapuran et al., 2020). There is no clear correlation between the size of the grave monuments (circular stone constructions) and age of the deceased. The huge amount of labour invested in the erection of grave monuments speaks for communal action rather than individual or family effort. Based on the size and density of the cemeteries it can be assumed that most of the community members were buried within the graveyard.



Fig. 10 Hajdučka česma, north-east Serbia. Grave 2 (photo and drawing: M. Gavranović and I. Petschko, AAI)

Good examples are the sites of Trnjane (with 43 uncovered graves) and Hajdučka česma (with an estimated 90 graves), situated only 1.5 km from each other (Kapuran et al., 2020) (Fig. 10). Spatial clustering of the graves presumably reflects burial places of different social or family groups. In terms of cultural assignment, the pottery spectrum from cemeteries in northeastern Serbia corresponds most closely to the Early and Middle Bronze Age Vatin group (Kapuran et al., 2020; Lazić, 2016) and the Paraćin group of the Morava valley (Jovanović & Janković, 1996).

At approximately the same time as in northeastern Serbia (nineteenth–seventeenth centuries BC), cremation burials in urns occur also in the Danube area of today's Croatia and Serbia, yet apparently not as an exclusive burial rite. The first urn graves in this territory are assigned to the Bijelo Brdo–Szeremle group in Slavonia (Majnarić-Pandžić, 1985; Medović, 2007) and the Vatin group in Vojvodina (Garašanin, 1983b; Gogâltan, 2014; Ljuština, 2012), but contemporary inhumations assigned to both of these groups are also recorded. Striking differences are observed between modestly equipped cremations (urn and just occasionally one adjoined vessel) and inhumations that included bronze jewellery sets (Vinski-Gasparini, 1973) and weaponry (Hänsel, 1968; Harding, 1995). The introduction of urn burials in this particular region can thus probably not be linked with individuals usually described as members of a social elite. In the mountainous region of the western Balkans south of the Sava river (Dinaric Alps and Dalmatia), cremation graves are unknown from this period, which is significant given that occasional incinerations are documented from a preceding period within several regional groups such as Belotić-Bela Crkva, Glasinac or Cetina (Teržan, 2013).

The first group that meets all essential criteria of the urnfield package in the Danube area is Dubovac–Žuto Brdo–Gârla Mare (DŽG), a southern manifestation of the large supra-regional phenomenon known as ‘Danubian Encrusted Pottery’ (Kiss, 2011; Reich, 2006; Șandor-Chicideanu, 2003; Šimić, 2000). The dating of this group in Croatia and Serbia is still not supported by radiocarbon dates, but investigations in neighbouring Hungary (Hajdu et al., 2016; Kiss, 2012b), Romania (Șandor-Chicideanu, 2003) and Bulgaria (Alexandrov et al., 2013) suggest the period 1900–1600 BC as being most probable. Judging from Glamija, the largest excavated cemetery of the DŽG group in Serbia with 32 graves (Krstić, 2003), as well as the nearby Romanian sites (Dumitrescu, 1961; Șandor-Chicideanu, 2003), funeral pyres were not located within the cemeteries and all demographic groups are proportionally represented among the interred. Urns were placed in pits and regularly covered with bowls, while bronze objects are very uncommon. Depositions of animal remains and a number of additional vessels (jugs, cups and bowls) are typical. Anthropomorphic statuettes with ornaments depicting clothes and jewellery are also characteristic for the DŽG and often found in graves of infants and children (Palincaș, 2010; Vasić, 2010).

The large cemeteries of the Belegiš I group, located in the same territory along the banks of the Danube, partially overlap with the end of the DŽG group (1600/1500 BC). Sites like Karaburma (300 graves), Stojića gumno (155 graves) and Kaluđerske livade (88 graves) include only cremations in urns (Petrović, 2006; Todorović, 1977; Vranić, 2002). The earliest graves of these sites are characterized by a pottery spectrum that resembles the encrusted pottery of the DŽG

group, followed by the graves containing forms and ornaments typical of the Belegiš I group. The urns of the Belegiš I group contained generally one individual, pyre debris and, infrequently, bronze jewellery damaged by fire, including pendants and bracelets. Apart from the bowl covering the urn, other accompanying vessels occur quite rarely (in less than 5% of burials). Regarding the spatial organization of burial places, the Belegiš cemeteries consist of several grave groups, interpreted as family burial places (Della Casa, 1996; Todorović, 1977). Most of the sites of the Belegiš group remained in use until the onset of the Urnfield Period (Bz D–Ha A1), without significant changes in burial practice but with the emergence of a new pottery style with channels as a dominant decoration (Belegiš II group).

During the late fifteenth and fourteenth centuries BC, cremation was adopted as a prevailing burial rite in several local groups in the central Balkans, such as the Paraćin group in the middle Morava valley (Garašanin, 1983c), Brnjica in south Serbia and Kosovo (Bulatović, 2011; Srejšević, 1960), and in western Serbia (Dmitrović, 2016; Filipović, 2013). The recently published radiocarbon dates all point to the fact that all these groups fully accepted cremation in urns considerably before the influence of the Central European urnfield phenomenon (Bulatović et al., 2018). Despite following the same ritual, all these groups expose significant differences when it comes to material culture and grave constructions. With flat urn graves popular in Paraćin, urns in stone-slab constructions in Brnjica and urns placed in tumuli in western Serbia, the regional component was obviously strongly pronounced. The regional variety of grave constructions in this area continued into the Urnfield Period, with cremation in urns remaining the principal burial form.

The transition between the Middle Bronze Age and the early Urnfield Period in the area west of the Danube is characterized by the start of new urn cemeteries assigned to two groups: Barice-Gređani in the middle Sava valley in Bosnia and Croatia (Čović, 1988; Karavanić, 2009; Marijan, 2010), and Virovitica in the Drava valley of northern Croatia and Slovenia (Karavanić, 2009; Ložnjak-Dizdar, 2014; Škvor Jernejčič, 2020; Teržan, 1999). The beginning of these urn cemeteries can be placed around 1500 BC (Teržan & Karavanić, 2013; Škvor Jernejčič, 2020). The main difference between the two neighbouring phenomena is in the opposing position of the vessel containing the cremation remains. Urns turned upside down in the pit are characteristic of Barice-Gređani, and urns with the opening to the top are typical at Virovitica, again underlining different regional preferences. Although they are both associated with the spread of the early urnfields in Central European terms, the size of the investigated cemeteries thus far (between 30 and 80 graves) indicates small social groups.

In general, it can be concluded that the first groups meeting all essential criteria of the urnfield package started in the central Balkans between the nineteenth and seventeenth centuries BC (northeastern Serbia). In the first half of the 2nd millennium BC, several local groups along the Danube (DGŽ, Belegiš 1) and in the Morava valley (Paraćin, Brnjica) also fully accepted and implemented cremation in urn graves, but with different regional traditions regarding the grave constructions. Except for scattered cremation graves in some of the local groups of the time around 2000 BC (Glasinac, Belotić-Bela Crkva and Cetina), the concept of cremation was completely rejected by Bronze Age groups in the Dinaric Alps or in the western Balkans. The

start and spread of the urnfield phenomenon at the beginning of the Late Bronze Age (fourteenth/thirteenth centuries BC) primarily influenced the regions between the Rivers Sava, Drava and Danube. Cremation graves with urns became the standardized burial custom, yet again with considerable regional peculiarities (Virovitica/Barice-Gređani group). At the same time, cremation was radically rejected during the Middle and Late Bronze Age of the Dinaric Alps, regardless of specific cultural or regional groups.

Conclusions: Homophily, Mobility, Geopolitics and Different Attitudes Towards the Innovation

The synthetic panorama presented here aims to highlight trends in the adoption of urnfields as a funerary custom mostly during Bz B2 and Bz C in the area from Hungary to northern Italy, through Austria and the northern Balkans. What appears unquestionable from the current archaeological evidence is that the diffusion of the urnfield model outside Hungary is not linear: it occurs asynchronously (at different times) and unsystematically (through different modes). In this particular case, geographical contiguity is not a sufficient parameter for explaining the phenomenon.

Radiocarbon dates are available for Hungary (Dani et al., 2016; Kiss et al., 2019; Major et al., 2019; Cavazzuti et al., 2021); northeastern Serbia (Gavranović & Kapuran, 2021; Kapuran et al., 2020; Mehofer et al., 2021); and the Terramare area (Cardarelli, 2014). There are, however, three main issues that affect attempts to build an absolute chronological framework when dealing with this kind of context. First, it is well-known that dating of cremation burials can be challenging, since cremated bones can provide slightly older or younger dates (e.g. due to the ‘old wood effect’ of the pyre, or to other diagenetic processes) than collagen samples of the same period (Snoeck, et al., 2014; Dani et al., 2016; Major et al., 2019). The strategy for supporting data obtained from calcined apatite is to also date charcoal, if available from the same grave, but results have nonetheless to be regarded with caution (Snoeck et al., 2014). Second, the urnfields tend to encompass such a large number of burials, and at the same time few grave goods, that it is almost impossible to design a sampling strategy to identify the oldest graves. Third, the standard deviation given by absolute dates is usually wider than the range provided by relative chronology (typo-chronology and stratigraphy).

Comparing the trend in the various areas, we observe that the sixteenth–fifteenth century BC is the main period when the urnfield package is introduced in several places, except in the Dubovac–Žuto Brdo–Gârla Mare (DŽG) area along the Danube and in northeast Serbia, where the adoption pre-dates this by a few centuries (Table 2 and Fig. 11).

The central Po plain (Emilian Terramare and eastern Lombardy) and the Sava/Drava and Lower Tisza plains (Belegiš I) converge towards the ‘radical’ adoption of the urnfield model (matching all the ‘essential’ criteria listed above).

North of the Alps, in the Piedmont and among the Terramare north of the Po, we instead observe a ‘gradual’ transition from inhumations to urn cremation (eg. Scalvinetto), also characterized by experiments and ritual hybridizations (e.g.

Table 2 Replication of the essential and optional criteria of the ‘urnfield package’ in the various regions considered

Archaeological culture	Chronology of earliest appearance of a significant number of urn cremations	Other associated cremation rituals	Other funerary rituals	(1) container	(2) selection	(3) anatomical order	(4) placement in pit	(5) reduction of grave goods	(6) representative demography	(7) burials in groups
Late Nagyrév/Valya	2000–1900 BC	None	Flat inhumation	Y	Y	Y	Y	Y	Y	Y
Encrusted Pottery	1900 BC	Scattered cremations	Flat inhumation	Y	Y	?	Y	Y	Y	Y
Terramare North	1450–1400 BC	None	Flat inhumation	Y	Y	Y	Y	Y	Y	Y
Terramare South	1500–1450 BC	None	None	Y	Y	Y	Y	Y	Y	Y
Austrian MBA (Pitten)	1600–1300 BC	In situ cremations, scattered cremations	Inhumations	Y	Y	?	Y	Y	Y	Y
Austrian LBA	1300–800 BC	Scattered cremation		Y	Y	?	Y	Y	Y	N
Belegiš I	1600–?/1400 BC	None	None	Y	?	?	Y	Y	?	Y
DŽG	1900–1500 BC	None	None	Y	?	?	Y	Y	Y	Y
Northeast Serbia	1900–1600 BC	Urns in stone constructions	None	Y	?	?	*	Y	?	Y?

Numbers correspond to criteria in Table 1 (Y = yes; N = No; ? = unknown; * = stone circular constructions)

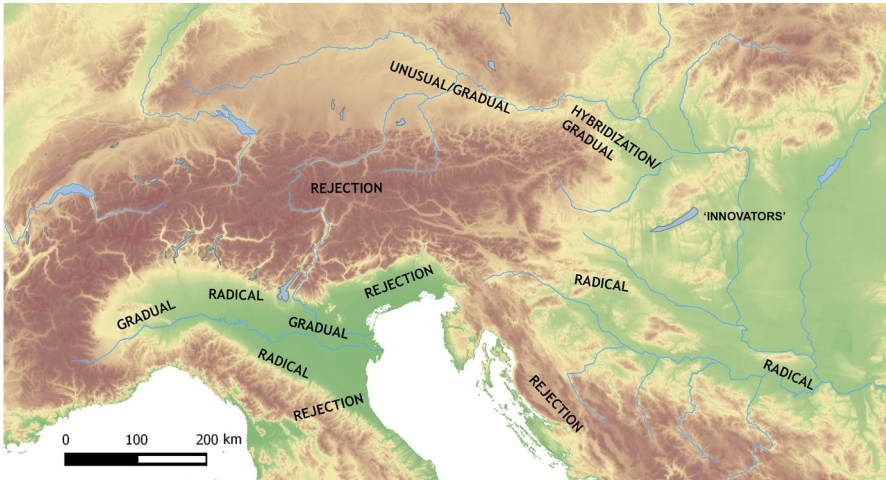


Fig. 11 Different attitudes of local communities towards the urnfield model during the period 1900–1400 BC, according to current archaeological evidence

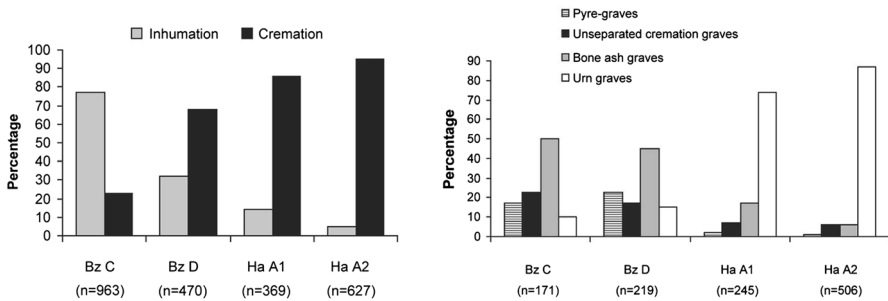


Fig. 12 The adoption of cremation (on the left) and the urnfield package (on the right) compared to other kinds of body treatments in southern Central Europe (mod. after Falkenstein, 2012)

Pitten), which brought the urnfield model to a full predominance only from Bz D–Ha A1 onwards (for a similar trend in southern Central Europe, see Falkenstein, 2012; Fig. 12).

In contrast, urn cremations seem completely absent in other areas, including Friuli Venezia Giulia, northern Veneto, along the Dinaric Alps and Dalmatia. Despite their proximity to urnfield adopters, the coastal Adriatic and the inner Alpine regions seem to be totally excluded from the phenomenon, at least during the Middle Bronze Age.

Overall, the plain areas along the two main rivers seem to be more ‘radical’ in the adoption of the urnfield package. Less accessible mountainous areas, with lesser propensity to interact, appear instead more inclined to reject the novelty, at least until the Urnfield Period *sensu stricto*. However, favourable ecological and geographical factors are not sufficient in themselves for transmitting an innovation: it has to be

‘adopted’ (Renfrew, 1984, p. 396). Demography, population density, cultural connectivity, mobility, social ties and power relationships contribute to the constitution of a permeable social context (cf. Scharl, 2016).

Rogers’s model offers an effective theoretical framework for explaining the diffusion of (successful) innovations within a social system, through the interplay between different ‘actors’: *innovators*, *early adopters*, *early majority*, *late majority*, *laggards* (Rogers, 2003, p. 281; Fig. 13). Although it is more frequently used in the field of recent technological innovations, the human dynamic that underpins diffusion is similar in prehistory (Hofmann, 2008, p. 79; Frieman, 2013; Scharl, 2016), and therefore seems appropriate for explaining the social mechanism of adoption. Diffusion of innovation theory has indeed been applied in the analysis of religious faiths, such as monotheism in the Late Roman period (Collar, 2007) or Protestantism in sixteenth century Germany (Cantoni, 2012).

An innovation becomes successful and widespread when it reaches a critical mass; if it does not, the aborted experiment will likely leave no, or perhaps narrowly confined, traces in the archaeological record. The decisive role in reaching the majority is played by groups of ‘early adopters’, who tend to occupy an influential position in the social network (Henrich, 2001, p. 1010; Hofmann, 2008, p. 79). The Bronze Age emerging elite groups, characterized by hereditary rank and high degree of interconnectedness (e.g. Mittnik et al., 2019), probably acted as a vehicle of transmission, collecting innovations from the network and disseminating horizontally (to other hegemonic groups) or vertically (to the subordinate segments of the society). In theoretical terms, the pivotal function of the early-adopter individuals operating within one society can be therefore extended to larger organisms, such as the trans-regional network, where each actor (each society) can show different attitudes towards the innovation.

Applying Rogers’ model to the network connecting the Danube and the Po areas, we can identify ‘innovators’ in the late Nagyrév/Vatya and, perhaps, Transdanubian Encrusted Pottery communities in Hungary. The possible occurrence of cenotaphs in the large Vatya urnfields (sometimes around 20% of the burials) may also reflect deaths outside the home territory, which can plausibly be the result of a high degree

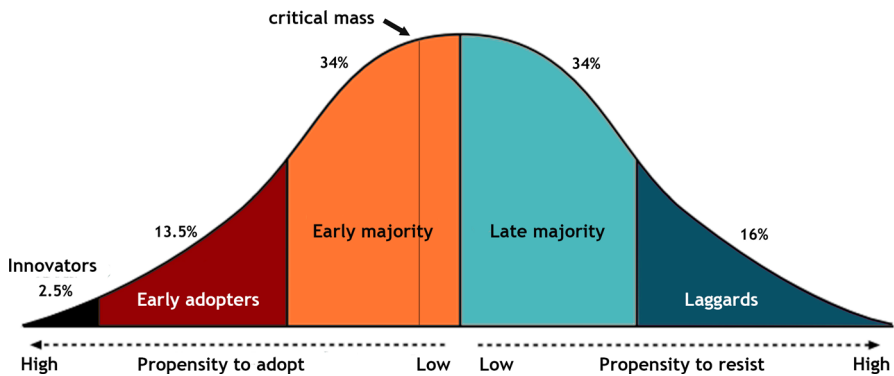


Fig. 13 Rogers’ theoretical model for the spread of innovations (after Rogers, 2003, p. 281)

of mobility towards other nodes of the network. Urns containing only a few grams of cremated bones could also be interpreted as ‘symbolic burials’ of individuals who died far away and whose ‘relics’ were returned to the community of origin (see also Liston, 2007, pp. 64–65; McKinley, 2009, p. 85). One of the advantages of cremating bodies is that the remains can be easily transported across long distances.

‘Single innovators’ moving from highly connected and influential regions to distant places were probably the vehicles for the spread of ideas, customs and rituals (as indicated, perhaps, by the Vatyá style urn found in Poysbrunn, Lower Austria: Benkovsky-Pivovarová, 1979). Where pre-existing corridors were already intensely travelled, ‘early adopters’, such as communities settled along the Danube and Po plains, might have been more inclined to introduce the novelty, more or less radically, as a consequence of the degree of homophily and variable resilience of traditional authorities.

From an economic perspective, the circulation of metal objects and metalworking technologies played a key role in establishing networks. This is also demonstrated by the evidence of a shared weighing system in Europe (Kuijpers & Popa, 2021; Pare, 2013). Balance weights are quite well distributed, at least from the first half of the second millennium BC, especially in those regions where contacts with eastern cultures were more frequent (Cardarelli et al., 2004; Ialongo, 2019; Rahmstorf, 2019). Their shapes are rather standardized, and their metrology reveals the presence of a consistent system of multiples and fractions that is compatible with other Mediterranean standards (Ialongo, 2019).

Interestingly, the technology transfer between the Carpathian Basin and the Po plain seems to also involve subsistence strategies and agricultural practices, as recently demonstrated by the spread of broomcorn millet cultivation/consumption during the fifteenth century BC (Filipović et al., 2020).

Women, and especially high-status women, seem to have had an especially important role in the selective diffusion of ideas and beliefs, as their high degree of mobility in this phase has been demonstrated by several isotope studies (Cavazzuti et al., 2019a, 2021; Frei et al., 2015, 2017; Knipper et al., 2017). Female mobility is normally associated with exogamy and patrilocality, but other options, in which women exercise agency rather than being subjected to it, should not be dismissed. It is nonetheless reasonable to assume that corridors and relationships were established and reinforced through marriage patterns and fosterage practices, especially among increasingly interconnected ruling classes.

Incidentally, strontium isotope ratios in the two alluvial plains of the Danube and the Po largely overlap, and it is therefore difficult to retrace the movement of people between these two areas (Cavazzuti et al., 2019a, 2019b, 2021; Giblin et al., 2013). Central Hungary yields $^{87}\text{Sr}/^{86}\text{Sr}$ values between 0.7089 and 0.7102, which are almost identical to the Po plain (0.7082–0.7102). Therefore, those individuals who appear local along the Middle Danube might come from northern Italy, and vice versa. However, although provenance cannot be easily identified, it has been recently demonstrated that large *terramare*, such as Scalvinetto di Fondo Paviani (15–20 ha), include around 50% of non-indigenous individuals, mainly women, not only from the hinterland (< 50 km), but also from much more distant places. As expected, smaller *terramare*, such as Casinalbo (2–3 ha), instead integrate individuals mostly

from the hinterland (Cavazzuti et al, 2019b). Nodes of the system, larger in population size and economically more attractive, were obviously more permeable, not only to exotic goods, but also to outsiders.

Nonetheless, flows of people and cultural/ideological change do not necessarily occur under peaceful conditions, especially if we consider the strong propensity of Middle Bronze Age societies for warfare (Frieman et al., 2017), which implies a high degree of conflict and competition for resources. The fact that the diffusion of the urnfield package occurs simultaneously with the collapse of the Middle Bronze Age cultures in Hungary raises a crucial question: is there any connection between these two phenomena? After several centuries of demographic growth and economic prosperity (c. 2000–1500 BC), concurrently with the appearance of the Tumulus culture in present-day Hungary, the tell system experienced a phase of crises, which brought, in some cases, substantial depopulation and/or reorganization of the settlement pattern (Sánta 2010; Fischl et al., 2013). Most of the tell sites were gradually abandoned, leaving space for a more dispersed and less structured settlement system.

It is not impossible that the supposed penetration of ‘Tumulus people’ into Hungary, perhaps when the tell settlement systems were already suffering a general crisis, provoked diasporas of refugees, especially along the corridors previously established towards more ‘friendly’ (or homophilous) communities, and consequently, a certain degree of admixture and cultural syncretism. Reflecting on the complex geopolitical scenario of the mid second millennium BC, Risch and Meller have openly suggested considering ‘how much these societies (Terramare) profited from the economic and political crises and/or collapse of other societies (Middle Bronze Age cultures in Hungary)’ (Risch & Meller, 2015, p. 253). A parallel can be seen in the spread of the urnfield tradition across peninsular Italy during the final phases of the Bronze Age (after 1150 BC), which coincides with the collapse and diaspora of the *terramare* people and the wide diffusion of the urn cremation rite throughout the peninsula (Cardarelli et al., 2009).

The fact that from the fourteenth century BC (Bz D) onwards the urnfield model significantly expanded across Europe seems to confirm the influential position of ‘the early adopters’ in the trans-cultural, supra-regional network. More than providing conclusions, our aim is to offer a new theoretical framework for further developments in the study of the advent of the *Urnenfelderzeit*. The recent advances in mobility studies may help us to disentangle the mechanisms of interaction and go beyond the opposing paradigms of pure cultural or demic diffusion.

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Declarations

Conflict of interest The authors declare that they have no conflict of interest.

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