

ZIRIDAVA  
STUDIA ARCHAEOLOGICA

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# Contents

## Research papers

- Gheorghe Lazarovici, Cornelia-Magda Lazarovici**  
The Copper Age. The Gold and Copper Metallurgy.....9
- Tünde Horváth**  
The Baden complex in Austria and Hungary – A comparative study..... 41
- Victor Sava, Florin Gogâltan**  
Before the Rise of the Late Bronze Age Mega Sites/Forts in the Lower Mureş Basin (20<sup>th</sup>–15<sup>th</sup>  
centuries BC).....85
- Remus Mihai Feraru**  
The celebration of Cybele: the festive cycle dedicated to the Great Mother of Gods in the Milesian  
colonies of the Propontis and Pontus Euxinus..... 165
- Georgeta El Susi, Cristian Oprean**  
Study of faunal remains from the Dacian settlement of Alunu – *Terasa Dacică 1*, Boşorod commune,  
Hunedoara County..... 193
- Călin Cosma**  
Seventh–Eighth centuries Earrings Discovered in Transylvania ..... 205
- Dan Băcueţ-Crişan, Aurel-Daniel Stănică, Timea Keresztes**  
Archaeological Materiality of Chess Playing in the Middle Ages. A Few (Possible) Examples from the  
Current Territory of Romania .....249
- Silviu Iliuţă**  
Ottoman fortifications on the territory of Banat (the 16<sup>th</sup>–18<sup>th</sup> Centuries).....259

## Field reports

- Constantin Adrian Boia**  
Archaeological fieldwalking in Berlişte, Milcoveni, Rusova Nouă, Rusova Veche and Iam (Caraş-  
Severin County).....319
- Andrei-Cătălin Discă**  
Roman Sites and Discoveries around Potaissa (VII). New data and clarifications regarding the Viişoara  
commune territory..... 333
- George Pascu Hurezan †, Florin Mărginean, Victor Sava**  
Rescue archaeological excavation at Arad-Parcul Copiilor, Arad County.....353
- Victor Sava, Ioan Cristian Cireap, Daniel Preda, Raluca R. Rusu, Alex Ciobotă, Adrian Cristian  
Ardelean, Adriana Sărăşan, Maria Tămăşan**  
Archaeological excavations carried out in the vicinity of the 19<sup>th</sup>-century iron ore reduction kiln/  
furnace at Zimbru, Arad County.....359

## Stray Finds

### **Andrei Baltag, Alexandru Berzovan**

Coin finds in the Măderat village area (Pâncota, Arad County) .....379

### **Florin Mărginean**

A sword discovered in the boundary between Horia and Sântana (Arad County).....387

Abbreviations .....391

# The Baden complex in Austria and Hungary – A comparative study

Tünde Horváth<sup>1</sup>

**Abstract:** When studying large cultural complexes with an extensive distribution (such as the Baden, the Bell Beaker, the Corded Ware and the Globular Amphorae culture, or the steppean cultures of any historical period), an approach with uniform analytical and descriptive criteria would be most desirable. This type of synchronisation could be best created at international symposia. However, despite the best intentions, these occasions usually serve as an opportunity for setting research agendas or for presenting a few radical novelties rather than for a comprehensive assessment and an interpretation covering all aspects and details. The re-naming and re-assessment of the Baden culture as a cultural complex is a relatively new research direction. Martin Furholt's new approach has called for a re-thinking not only of the very concept of "culture" that was earlier viewed as being an archaeologically uniform entity, but also of the entire range of concepts associated with it (such as chronology, quotidian and ritual sphere, settlement patterns, subsistence and economy, society), a work that has only just begun. One goal of this publication is to present our Austrian and Hungarian knowledge in a new light.

**Keywords:** Late Copper Age; Baden complex; similarities & differences between Austria and Hungary.

## Introduction

In Hungarian prehistoric studies, the period between 3700 and 2800 BC is called the Late Copper Age – unlike in other (Central) European countries where the same period is known as the Late Neolithic, the *Jungneolithikum/Spätneolithikum*, or the *Jungsteinzeit*<sup>2</sup>. The Baden complex is one of the dominant cultures of this long period, spanning almost a thousand years.

The autonomy of the Copper Age of the Balkans (South-Eastern Europe) was acknowledged in the wake of Colin Renfrew's studies in the 1960–70s<sup>3</sup>; more recently, a similar advance has been made regarding the independent Copper Age of the Iberian Peninsula<sup>4</sup>. Irrespectively of the fact that one of the main pillars of the change in terminology was the magnificent metalwork in these regions, Hungarian prehistorians have used this label for a culture whose metal finds are barely known, from the very beginning, from the 1890s<sup>5</sup>.

In many respects, Baden is much more than an archaeological culture, a point that was first raised in the 1960s, this being the reason that Baden is designated as a culture complex in several studies written by Vierá Němejcová-Pavúková, Evžen Neustupný and József Korek<sup>6</sup>.

In fact, early scholars of this period already sensed something of the culture's complexity since, for example, Josef Bayer, who excavated one of the very first Baden sites at Ossarn, called it a *Mischkultur*<sup>7</sup>. Baden eclipses the average prehistoric archaeological culture not merely owing to its vast distribution from the Black Forest to the Black Sea and its long temporal sequence<sup>8</sup>. The irradiation of its material culture and its impact on other cultures was the most salient feature that led to its designation as a cultural complex. Some prehistorians traced this cultural irradiation as far as Troy in Anatolia in the light of the anthropomorphic vessels found at Troy and Ózd<sup>9</sup>, and the wagon models brought to light

<sup>1</sup> The article based upon the final report of my Lise Meitner Grant, M 2003-G25/AM 0200321 project, 2016.06.01–2018.05.31.

<sup>2</sup> Ruttkay 1999; Horváth 2015a; Horváth 2016.

<sup>3</sup> Renfrew 1969.

<sup>4</sup> Bartelheim, Krauss 2012.

<sup>5</sup> Hampel 1895.

<sup>6</sup> Němejcová-Pavúková 1981; Neustupný 1968; Korek 1983.

<sup>7</sup> Bayer 1928.

<sup>8</sup> Horváth *et al.* 2008.

<sup>9</sup> Kalicz 1963.

at Budakalász<sup>10</sup>. It has been suggested that the Baden culture can be linked to immigrants from Troy – conversely, other prehistorians tend to highlight the culture’s local roots in its emergence. In fact, the culture’s cradle and the circumstances of its emergence are still unknown.

In Hungary, the term Baden complex covers Boleráz, the early Baden phase, the classical Baden phases, as well as the Cernavodă III, Kostolác and Vučedol cultures, which share many similarities with classical Baden and are partly or wholly contemporaneous with it<sup>11</sup>. These cultures and groups are regarded as populations with a material culture that is related to Baden. The archaeological terminology of these cultures is not uniform, reflecting the many uncertainties which, at the current state of research, cannot be resolved. Following Martin Furholt, the more neutral term of “pottery style” is used for their designation and for distinguishing between them instead of group, culture or phase<sup>12</sup>.

A wholly intrusive population, the communities of the Pit-grave kurgan culture arriving from the Far Eastern steppe, occupied the Hungarian Plain during the same period as the cultures of the Baden complex. In the trans-Tisza region, the Pit-grave areas were wedged into the Baden territory, mostly in the grassland unoccupied by Baden. A clarification of the nature of the interactions between these two markedly different populations remains a task for future research. While the Baden heartland is located inside the Carpathian Basin, the core distribution of the Lower Danubian Cernavodă III, Kostolác and Vučedol cultures as well as of the eastern steppean Pit-grave kurgan culture lies beyond Hungary, and only a small portion of their population actually infiltrated the region. In their case, their integration into Baden, the autochthonous culture in Hungary, represents one intriguing issue, while another is the changes in the culture of the groups who moved away, split off or simply drifted to the fringes compared to their brethren who remained in the heartlands of their respective cultures<sup>13</sup>.

While the relationship between the period’s archaeological cultures, groups, styles and phases, and their chronological position relative to each other has since long been broadly established, much less is known about the sites owing to the small size of the investigated areas and, perhaps even more importantly, because most of these have not been published. Over fifty years elapsed between the excavation and the publication of two unique burial grounds, the Boleráz cemetery at Pilismarót-Basa-harc<sup>14</sup> and the Baden cemetery at Budakalász<sup>15</sup>, despite their being well known to international scholarship. These circumstances were hardly conducive to Late Copper Age studies.

In the meantime, the growing number of radiocarbon dates and the advances made in radiocarbon dating led to a wide gap between the period’s absolute and relative chronological position. The gap between the two spanned some 1500 years in terms of the Baden culture, whose onset was traditionally dated between 2200 and 2000 BC – the emergence of Baden was pushed back to 3700 BC in the light of the radiocarbon dates from some Austrian sites. While the clash between the short and the long chronology ultimately ended with the adoption of the long chronology, prehistorians largely failed to address the implications of this chronological shift. For a very long time, all discussion of the impossibility of any contact between Baden and Troy was studiously avoided. (Given that the occupation of Troy began around 3000 BC, Baden could hardly be synchronised with Troy levels II–V, dated between 2200 and 2000 BC, if the culture emerged in 3700 BC.) Neither was it examined how, in the wake of the period’s changed chronological position, the late Middle Copper Age cultures preceding Baden may have impacted the emergence of Baden, or how Baden faded into the Early Bronze Age cultures succeeding it. This chaos principally affected the Balkans and Anatolia, until Joseph Maran clarified the main issues in a comprehensive study<sup>16</sup>.

The large-scale excavations from the 1990s onward in Hungary (and the changes in the legal climate) finally enabled the investigation of previously unimaginably extensive areas with various techniques that had not been employed earlier as well as the primary assessment of the finds. Although a final report on most of these excavations is still unavailable, some patterns could nevertheless be

<sup>10</sup> Soproni 1954.

<sup>11</sup> Horváth 2016.

<sup>12</sup> Furholt 2008.

<sup>13</sup> Horváth 2011; Dani, Horváth 2012; Horváth, Balen 2012; Horváth 2014c.

<sup>14</sup> Bondár 2015.

<sup>15</sup> Bondár, Raczky 2009.

<sup>16</sup> Maran 1998.

identified regarding the nature and internal layout of the sites as well as the overall settlement network and the complex's lifeways and chronology.

The single Late Copper Age Boleráz–Baden site that has been fully assessed and published is Balatonőszöd–Temetői-dűlő<sup>17</sup>, lying in an area that János Banner had identified as the territory of the so-called Fonyód group.

In his monograph on the Baden culture published in 1956, János Banner outlined a regional Baden group which he labelled the Fonyód–Úny group after a smaller cemetery section with nineteen cremation and two inhumation burials uncovered at Fonyód–Bézsény-puszta in 1935<sup>18</sup>. Unfortunately, it remains unclear from what is known about the excavation whether the site represents part of a formal cemetery, whether it lay on the fringes or immediately adjacent to a settlement, or whether the burials were actually settlement burials. The sites uncovered along the planned track of the M7 Motorway using modern field techniques yielded finds of both Boleráz and Baden, and all sites were occupied over considerably more phases than Baden IIa. In this sense, the concept of the Fonyód group as defined by János Banner can be discarded<sup>19</sup>. The newly identified sites outline the shoreline zone of Lake Balaton during the Late Copper Age, although there are a few sites farther inland along the smaller watercourses flowing into the lake.

Returning to Balatonőszöd, the sites along the watercourse beside which the settlement is located outline a closed settlement network. Much more detailed studies and a meticulous assessment of all excavated sites would be necessary to confirm that these were established by the same community as the one settling at Balatonőszöd and to determine whether there was any hierarchy between them. Some of the sites in the settlement network could have been formal cemeteries or animal pens without any settlement features, while others could have functioned as seasonal, intermittent or permanent settlements<sup>20</sup>.

Three other sites of the southern Balaton region must be highlighted, which can provide information for modelling the Late Copper Age settlement network. One of these is the site on the outskirts of Balatonlelle, extending along the opposite banks of a former watercourse, the Forró-árok<sup>21</sup>. The site on one side was a Boleráz–Baden settlement with settlement burials and sacrifices as at Balatonőszöd, while the site on the other side of the watercourse was a separate formal cemetery obviously associated with the settlement. Unfortunately, only the report on the burial ground has been published to date, but even so, the preliminary data shed some light on a recurring pattern: some settlements had a separate community cemetery, usually located on the bank of a watercourse opposite the settlement. A similar situation was documented at the sites of Vámosgyörk<sup>22</sup> and Ratzersdorf<sup>23</sup>. The implication for future research is that formal Baden cemeteries can perhaps be more successfully searched for in the light of this pattern, and a rise in their number can be expected.

The other interesting region is represented by the sites in the Balatonszemes and Balatonlelle–Balatonboglár area, which were perhaps part of a huge conglomerate of sites. In this case, we are faced with the problem that in the lack of an association between the excavated areas, we are not always capable of determining whether the investigated site portions lying strikingly close to each other were part of the same huge continuous site, or whether they were the independent, neighbouring links of a chain of settlements along a watercourse. The sites at Balatonszemes–Szemesi-berek and Balatonszemes–Egyenes-dűlő in the Balatonszemes area were quite certainly the continuations of the same site, and the continuity between the sites at Balatonlelle–Rádi út mellett, Balatonlelle–Rádi-domb and Rádpuszta–Temetői-dűlő too seems quite probable<sup>24</sup>.

The third highly promising site is Balatonkeresztúr–Réti-dűlő, which lies slightly farther from Lake Balaton, in the wetland along the River Zala<sup>25</sup>. Unfortunately, the assessment of the site is incomplete. The occupation pattern of this settlement differed from the Balatonőszöd settlement since the

<sup>17</sup> Horváth 2014a.

<sup>18</sup> Banner 1956, 28–32.

<sup>19</sup> Horváth 2014a, Chapter 4.

<sup>20</sup> Horváth 2014a, Chapter 4.

<sup>21</sup> Nagy 2010.

<sup>22</sup> Farkas 2004.

<sup>23</sup> Krumpel 2008; Krumpel 2012.

<sup>24</sup> Fábrián 2014, 398–445.

<sup>25</sup> Fábrián 2013; Fábrián 2014.

Baden and the Boleráz features lay among each other across the settlement's entire territory, while the radiocarbon dates confirmed a relative chronology in which the successive phases followed each other fairly rapidly. There was no indication of a post-Copper Age survival. If the preliminary report can be believed, the significance of the site lies in that it indicates an entirely different occupation pattern than at Balatonőszöd, with a full spatial mixing between Boleráz and Baden, while its chronological range has an entirely different dynamism than that of the Boleráz and Baden communities at Balatonőszöd, where the two co-resided for a long time, but in isolation from each other.

The main conclusions – and caveats – that can be drawn from the data are that the regional Baden groups as defined by Banner, which have been strictly adhered to in Hungarian prehistoric studies, have practically lost their relevance and that very different cultural and occupation patterns can be discerned even within the same geographic region such as the southern Balaton one, meaning that the period was characterised by a mosaic-like cultural patterning. However, this does not mean that we will not encounter recurring patterns, one good illustration of which is the combination of settlements and their associated cemeteries. It is also quite evident that the settlement layouts and settlement networks of the Baden complex can hardly be described with a single model.

### Goals and questions

No matter how well researched, a single site such as Balatonőszöd or even an entire region such as the southern Balaton region is insufficient for constructing models on the country or on the culture level, for which a much larger sample is necessary. This can be achieved by the critical review of older assemblages and the assessment of new excavations to broaden our overall picture as much as the evidence permits.

### The Hungarian part of my research

In the following, I shall briefly discuss my preliminary findings regarding the sites analysed as part of my Lise Meitner scholarship. I made every effort to cover the entire territory of Hungary; however, bearing in mind that I only had two years at my disposal, I had to make a few compromises. I did not find any evaluable material in southern Transdanubia or in the country's central region, in the Danube–Tisza interfluvium. As an alternative, I undertook the critical review of the monographs on Pilismarót and Budakalász, the two cemeteries lying in this region<sup>26</sup>. I assessed three new sites in the Szombathely area<sup>27</sup>, in north-western Hungary bordering on the Burgenland, one site in Tatabánya in north-western Transdanubia<sup>28</sup>, one site on the outskirts of Hódmezővásárhely in the southern Hungarian Plain<sup>29</sup>, one site on the outskirts of Vámosgyörk in the piedmont area in the northern Hungarian Plain, and I also undertook the critical re-assessment of several already published sites in the Salgótarján and Ózd areas<sup>30</sup> as well as the assessment of a new site at Szurdokpuszpöki<sup>31</sup> in the country's north-eastern region.

These Hungarian sites are either well-known iconic sites of the Baden complex, which largely determined our perception of the culture, or are the key sites of a regional Baden group as defined by János Banner, and thus play a prominent role in the study of a region's site network or in the critical review of a Baden group.

### New research in Hungary

#### *Szombathely*

I undertook the assessment of three sites in Szombathely, which can be regarded as the region's first Late Copper Age sites found since the 1990s, after a long research gap. A Boleráz pit was found during the construction of Road 89 bypassing the town; two other pits and part of a Kostolác settlement

<sup>26</sup> Horváth 2013; Horváth 2016; Horváth 2017c.

<sup>27</sup> Horváth 2017a; Horváth 2017b; Horváth, Wild 2017.

<sup>28</sup> Horváth *et al.* 2018b.

<sup>29</sup> Horváth, Zandler 2017; Horváth 2018b.

<sup>30</sup> Horváth 2018a.

<sup>31</sup> Horváth *et al.* 2017; Horváth *et al.* 2018a.



came to light<sup>32</sup> slightly north of the Boleráz pit<sup>33</sup>. The water washed out an assemblage of Baden vessels in a former gravel pit inside the city<sup>34</sup>. The three sites represent three different cultures and periods of the Late Copper Age, although, unfortunately, not on the same site, which would have enabled a study of the transition between them. The vessel types of the Boleráz site and their ornamentation have much in common with the Boleráz material from Austria, and the site's very early date, falling around 3700/3600 BC, similarly compares well. The Kostolác site is rather unusual in Hungary because it lacks Baden material; instead, this site yielded genuine Pivnica-type late Kostolác material without any Baden. Its radiocarbon date assigns this Kostolác settlement part to after the Late Copper Age, to the Copper Age/Bronze Age transition between 2800 and 2600 BC. The assemblage of Baden vessels washed out by the water in the Újperint gravel pit included a most unusual vessel: a mug bearing an incised labrys on its base. This motif represents the double axe, an artefact type formerly unencountered in Baden, which is a reflection of the culture's far-ranging contacts.

#### *Tatabánya*

A small portion of a Baden settlement was uncovered in the inner city area of Tatabánya, where only the lower sections of various features could be observed owing to later disturbances and natural erosion. Only a more deeply dug settlement grave containing a double burial survived undisturbed. One unusual feature of this grave, containing the burial of a man and a woman embracing each other, was that the woman was apparently interred in a funerary garment covered with *Dentalium* beads. An arrowhead was found in her abdomen, suggesting a violent death. According to the field observations, there were no similar traces or finds suggesting an unnatural death in the case of the man, who had been interred at a much earlier date. This double burial offered an opportunity for a critical look at Banner's Úny group and for the reconstruction of how *Dentalium* adornments had been worn. The slight difference in the radiocarbon dates confirms that the two bodies had not been interred at the same time, providing additional evidence for the observations made at Balatonőszöd regarding the diversity of burial rites and the *post-mortem* manipulation of the bodies<sup>35</sup>.

#### *Vámosgyörk*

Several excavations have been conducted on the outskirts of Vámosgyörk, a site lying in the area where the Hungarian plain grades into the piedmont. Some 5000 m<sup>2</sup> of the site has been investigated since 1997: one part is made up of a settlement of which fifty features have been uncovered, while the other is the settlement's burial ground lying on the opposite bank of the Gyöngyös Stream, where fifteen burials have been unearthed<sup>36</sup>. We have inventoried some forty thousand artefacts from this site to date. One intriguing aspect of the site is that an Early Bronze Age occupation could also be documented, meaning that the cultural trajectory of a longer period can be studied here, while the burial ground also contained five mixed Bodrogkeresztúr–Ludanice graves of the Middle Copper Age. The site can be assigned to János Banner's Viss group, whose most distinctive features are the grooved strap handle and the ornamentation of vessel surfaces with stabbed patterns. A Boleráz presence has not been documented either at the site or in its broader region.

#### *Ózd, Salgótarján and Szurdokpüspöki (north-eastern Hungary)*

The sites hallmarking Phase IV, the latest phase of the Baden culture, lying in the Ózd area and at Salgótarján–Pécs-kő, are all known since long from their publications<sup>37</sup>. Following the discovery of the anthropomorphic funerary urns containing cremation burials deposited under funerary mounds at Ózd–Center, Nándor Kalicz (1963) argued that these Baden finds can be associated with the face urns from Levels II–V of Troy and that the Baden culture emerged under the influence of groups who had migrated to the Carpathian Basin from Troy.

The sites in the Ózd area were recently revisited in a doctoral thesis written in 2014, which

<sup>32</sup> Horváth, Wild 2017.

<sup>33</sup> Horváth 2017a.

<sup>34</sup> Horváth 2017b; Horváth 2018c.

<sup>35</sup> Horváth *et al.* 2018b.

<sup>36</sup> Farkas 2004.

<sup>37</sup> Banner 1956; Kalicz 1963; Korek *et al.* 1968.

confirmed the previous scholarly consensus<sup>38</sup>. However, my own research yielded radically different conclusions. The change was effectuated by a modern excavation on the outskirts of Szurdokpüspöki, where, in addition to the portion of a jointly occupied Late Copper Age Boleráz and Baden settlement, part of a Late Bronze Age settlement was also uncovered<sup>39</sup>. This enabled the separation of the finds described as reflecting Kostolác, Bosáca and Coțofeni influences designated as Baden IV from the genuine Baden finds in the assemblages from the sites in the Ózd and Salgótarján area. As it turned out, the finds previously described as late Baden or as reflecting the impact of other cultures could in fact be assigned to the Late Bronze Age Tumulus culture.

The genuine Baden finds do not have any traits typical for Phase IV – although it must be borne in mind that the salient features of Phase IV have not been determined yet owing to the lack of sites and finds. The Baden sequence has only been elaborated up to Phase IVa, and thus we do not really know what the Baden IVb phase actually looks like. It yet remains to be determined whether Baden IV is “missing” because the culture does not have this typological phase or whether it is lacking because only its onset was defined, and now that the finds previously attributed to this phase have been assigned to other periods, we are at a loss as to how to fill up Baden IV, what types should be ordered here. Since we are unable to fill the period with types, we cannot single them out either. The finds remaining in the Late Copper Age are Baden II and III types, which are mixed with genuine Kostolác and Kostolác-type finds. However, the old excavations do not provide sufficient information to enable an assessment on the settlement level. As we have seen, relative typo-chronology is of no use in this case, while an absolute chronology could only be confidently employed in the case of securely identified Baden cemeteries – it seemed senseless to even attempt to select samples from settlement material mixed up with the finds of other periods<sup>40</sup>.

The first radiocarbon measurements for the cremation burials in the anthropomorphic urns from Ózd–Center and the formal cemetery at Szentsimon gave dates between 3100 and 2900 BC, confirming that they fall into later Baden, the later classical Baden period, which is still well within the Late Copper Age, meaning that, for the time being, a post-Copper Age Baden survival cannot be demonstrated in this region<sup>41</sup>.

Following the critical review of the material from the stratified, fortified, tell-like hilltop Baden settlement at Salgótarján–Pécs-kő, I found that no more than sixteen of the roughly six hundred finds previously assigned to Baden could in fact be assigned to the Late Copper Age, while the other finds actually dated from other periods. As a consequence, the site can hardly be regarded as a fortified hilltop or even a stratified tell-like Baden settlement since it was predominantly occupied by the Hatvan, Tumulus and Piliny cultures of the Bronze Age and most of the occupation levels can be associated with Bronze Age cultures and not with Baden. Moreover, there is no evidence that the site had been fortified<sup>42</sup>.

#### *Hódmezővásárhely*

A 58,000 m<sup>2</sup> large area on a hill overlooking a former Tisza meander was investigated on the southern outskirts of Hódmezővásárhely in 2009. Of the seven hundred features uncovered at this site, a hundred can be assigned to the Late Copper Age Baden culture. The features of the classical Baden culture uncovered in the four adjacent trenches showed a concentration in the site's central area, with a scarcer scatter of finds in a fifty meters wide zone, followed by a hundred meters wide zone lacking any features, after which various features were again documented. The separate cluster of features and the zone reflecting a scarcer occupation can perhaps be interpreted as indicating a dispersed settlement layout, or perhaps as independent links within a settlement chain.

Most of the uncovered features were pits, alongside two wells and several animal and human deposits as well as a unique chipped stone hoard deposited in a mug<sup>43</sup>. One peculiar trait of the site is that the neighbouring sites yielding similar material were described as representing the Baden IV

<sup>38</sup> György 2014.

<sup>39</sup> Horváth *et al.* 2017; Horváth *et al.* 2018a.

<sup>40</sup> Horváth 2018a.

<sup>41</sup> Horváth 2018a.

<sup>42</sup> Horváth 2017d.

<sup>43</sup> Horváth, Zandler 2017; Horváth 2018b, 57–63.



phase. However, the assessment of the finds revealed that the material can be assigned to the classical Baden II–III phases, while the vessels earlier identified as representing Phase IV are actually Kostolác or Kostolác-type ceramics. This relative chronology is confirmed by the radiocarbon dates, none of which fall beyond 3000 BC. The meticulous field observations allow the conclusion that the three archaeologically distinguishable pottery styles, namely classical Baden, Kostolác-type and genuine Kostolác, are contemporaneous because they occurred jointly in closed, undisturbed features. There was no trace of Boleráz at the site and thus a Boleráz–Baden sequence can be rejected in this region too. This site, lying in the country's south-eastern corner, confirms the conclusion drawn from the critical review of find assemblages from the north-eastern region that the finds hitherto ordered into the Baden IV phase can in fact be typologically assigned to Kostolác, and that they do not succeed the classical Baden II–III phases, but are contemporaneous with it<sup>44</sup>.

### The Austrian part of my research

The Austrian part of my research involved the assessment of a site in Burgenland<sup>45</sup>. Some of the other planned work such as the re-assessment of the material from an old excavation at Baden–Königshöhle could not be undertaken for various reasons beyond my control (the *Stadtmuseum Wien* is under general renewal and the collections are not accessible, the *Rolettmuseum Baden* is trying to find financial support for this purpose). A grant application for the assessment of old excavations at Mödling–Jennyberg as an ongoing Stand Alone Project was successful.

I personally examined several significant Austrian Baden assemblages in the collections of various museums. The principal goal of the Austrian part of the project was to identify groups or pottery styles, if any, within classical Baden as had been done by János Banner for Hungary, and to describe and correlate them with the Hungarian groups/styles both chronologically and regionally. The personal examination of the excavated finds (most of which are still unpublished) and a familiarity with the reports on newly excavated sites were essential for gaining a personal familiarity with Austrian Boleráz and Baden.

The goal of the project was to seek answers to the following questions in relation to the Austrian material, in the light of the new Hungarian research findings:

– 1. Did Baden survive into the Bronze Age, and if so, what was the relation between Baden and the cultures traditionally assigned to the Late Neolithic III and the Early Bronze Age (e.g. Cham; Kostolác, Vučedol, Jevišovice, Bell Beaker, Makó–Kosihy–Čaka, Somogyvár–Vinkovci)?

– 2. Is there any correlation between settlement types, site types and the geographic environment (mountains: cave sanctuaries/seasonally or intermittently occupied settlements/campsites/animal pens, mountain pastures, peak sanctuaries, upland hillforts/fortifications, traces of the exploitation of ore and lithic deposits; wetland settlements: settlement chains, pile dwellings, lakeside settlements; open plainland settlements: permanently and seasonally or intermittently occupied settlements/animal pens)?

– 3. Countless human burials have been brought to light in Austria; however, only one single regular cemetery is known (near Sitzenberg), while the other burials came to light on settlement sites and can be interpreted variously<sup>46</sup>. In Hungary, the relation between a formal cemetery and the associated permanent settlement could be studied in three cases<sup>47</sup>. We yet lack a model (or models) for interpreting the burials unearthed in Austria.

– 4. What is the spatial extension and the chronological span of the Baden occupation on Austrian settlements, regarding both their relative and absolute chronology?<sup>48</sup>

– 5. Are there any regional differences (groups *sensu* Banner) of any kind between Upper and Lower Austria, and what are the defining cultural orientations and connections of the Austrian sites (towards Switzerland/Germany and Hungary/Slovakia/Moravia, respectively) within the Baden complex? Is there any relation between the trajectories of cultural connections and the innovation, namely the wheel/wagon, first used by this cultural complex?<sup>49</sup>

<sup>44</sup> Horváth 2018b.

<sup>45</sup> Unterloisdorf: Horváth, Fiebig 2022.

<sup>46</sup> Sacrifices, burials, later manipulations, etc. cp. Mayer 1991; Mayer 2008; Kritschner 1985.

<sup>47</sup> Horváth *et al.* 2007.

<sup>48</sup> Stadler *et al.* 2001; Horváth 2010; Horváth *et al.* 2008.

<sup>49</sup> Horváth, Balen 2012; Horváth 2015b.

–6. Are there any similarities between the few animal burials found in Austria and the similar burials unearthed in Hungary?<sup>50</sup>

### New research in Austria

#### *Unterloisdorf*

Seventeen pits, part of a Baden settlement, were excavated between Unter- and Oberloisdorf in 2014. The occupation of the site began during the Baden IIa period and ended with Baden–Kostolác (Ossarn I–II), outlining its relative chronology. Although similar sites have been reported in the excavation reports from Burgenland, these sites remain unpublished, and thus the site has no close parallels in Burgenland<sup>51</sup>.

## Comparison between Hungary and Austria

### Distribution

#### *General topography: geographical and time frames, site types, internal phases*

First, I created a register of the Austrian sites of the Baden complex, with subdivisions according to Boleráz and classical Baden as well as the cultures/groups/phases preceding and succeeding the period of Baden complex.

The register is based on the excavation reports published in *Fundberichte aus Österreich* and the studies of the period's main researchers such as Elisabeth Ruttkay (1999), Oliver Schmitsberger (2004, 191–195), Johannes Krumpel (2005, 174–175) and the most recent and most thorough mapping of the relevant sites by Christian Mayer (2008).

#### *Geographical frame*

In his 2008 study, Christian Mayer wrote of 205 sites of the Baden complex<sup>52</sup>. In comparison, roughly 1700 sites are known from Hungary<sup>53</sup>. However, following the critical review of the data, my register has 152 Austrian sites<sup>54</sup>, while the number of Hungarian sites is about 700:<sup>55</sup> these are the sites about which an archaeological report is available and about which it can be confirmed from the literature that they can really be assigned to the Baden complex (potential sites without any citable academic source were omitted from the register).

When comparing the sites of the Baden complex, it is clear that more are known from the territory of Hungary than from Austria (cp. Fig 1)<sup>56</sup>. The reason for this difference can hardly be sought in the size of the two countries because the difference between their territory is not so great (Hungary: 93,030 m<sup>2</sup>, Austria: 83,879 m<sup>2</sup>).

The explanation should rather be sought in their highly different relief (see Fig. 1). One-half of Austria is covered by high mountains with altitudes between 500 and 4900 m (Central Eastern Alps, Northern Limestone Alps, Southern Limestone Alps), one-third by lower mountains (Fore-Alps and the Bohemian Mass with the *Waldviertel* and the *Weinviertel*), and only one-fifth by flat plains or basins (Vienna, Linz and Graz Basins) and lower hills suitable for settlement (Hills of Eastern Styria). The large part of the country remained uncolonised by the Baden complex, while the large part of Hungary was settled because its territory is largely covered by flat plains, lower hills and mountains, without higher ones (currently, 60% of Hungary is arable land) (Fig. 1).

In both countries, most of the sites are open settlements located on the banks of one-time or current watercourses or lakeshores, on flat or lower hill slopes, below 350 m<sup>57</sup>. In Austria, the Baden complex established its settlements along the Danube and its smaller tributaries to the south (Enns, Traisen, Leitha) and the north (Kamp, March), with a concentration in two provinces, Lower Austria

<sup>50</sup> Horváth 2010; Horváth 2012a; Horváth 2019; Behrens 1963; Behrens 1964; Kreiner 1993; Driesch-Gerstner 1993.

<sup>51</sup> Horváth, Fiebig 2022.

<sup>52</sup> Mayer 2008, 167.

<sup>53</sup> Bondár 2002, Tab. 1.3.

<sup>54</sup> There is a difference between the number of sites included in my own Austrian register and the national database, as in the case of Hungarian sites: I only included sites with verifiable publications.

<sup>55</sup> Horváth 2015a, 132; Horváth 2016, 83.

<sup>56</sup> Horváth 2016, 105, Fig. 4.1.

<sup>57</sup> Mayer 2008, Fig. 5; Horváth 2014a, Chapter 4, Horváth 2018a, 82–89; Horváth 2018b, Chapter 6.





Fig. 1. Central Europe with Hungary and Austria (basemap: Esri Street).

and Burgenland, except for two Boleráz sites and a Baden one in Upper Austria, near the River Enns. The main axis of the complex's spread was the Danube, as in Hungary<sup>58</sup>. The dense settlement cores are the southern Danubian region (Vienna Basin), the Leitha and March Valleys, the eastern part of the Vienna Woods (*Wienerwald*) and the Traisen Valley in Lower Austria, the northern part of Burgenland, with a few sites in the Forest Quarter (*Waldviertel*).

Nevertheless, similarly to the complex's entire distribution<sup>59</sup>, we can see isolated sites or enclaves far from the central and organic Baden complex territory in Austria. In Hungary too, there are areas devoid of sites<sup>60</sup>.

In Austria, there is a coherent distribution in northern Lower Austria towards Burgenland, while the Boleráz and Baden sites in the Enns Valley are disjunct from this core territory. The sites in Upper Austria were important chains and potential mediating stations towards the *Pfahlbau*-type Boleráz and Baden settlements in the Bodensee area and southern Germany<sup>61</sup>. One intriguing question is whether the “missing” sites between the core area and the Enns Valley have simply not been discovered and reflect a research gap, or whether there is a genuine hiatus without sites in the Baden land. Another question is whether they represent isolated sites or pioneer sites for new enclaves of Boleráz and Baden.

The greater part of the unsettled Austrian region can be explained by its high altitude (except for a handful of sites located above 800 m; see below). What is the situation in the case of areas lacking sites of the Baden complex or having but few sites (St. Martin an der Raab), despite being flat or lower-lying regions of Austria (e.g. the Graz Basin along the Raab and Mur Rivers, and the flat lands of Upper Austria west of the River Enns, the Linz Basin) where only few sites are known (e.g. the *Waldviertel*)?

A comparison of the distribution of Boleráz and classical Baden in Austria immediately reveals

<sup>58</sup> Horváth *et al.* 2008, 456, Fig. 5.

<sup>59</sup> Such as the Ljubljana Marshes and Lesser Poland: Horváth 2009, 121.

<sup>60</sup> Horváth 2009, Fig. 19; Horváth 2016, 105, Fig. 4.

<sup>61</sup> Mayer 2008, Fig. 7; Matuschik 2001, 680–681.



that the boundary of Boleráz distribution in the south-east runs along the latitudinal line of Lake Neusiedl, while Baden extended as far as the line of Oberpullendorf.

There is a correlation with the Hungarian record, given that no Baden sites were detected in County Zala, west of Hahót<sup>62</sup>, a region not far from this Austrian line. This line marked the physical boundary of the distribution, although it is yet unclear why Baden stopped there because there was no neighbouring culture towards the west. Perhaps it was not a cultural, but a natural boundary.

Another clue is that Kostolác–classical Baden assemblages can be found across the area enclosed by the Körös, Fehér-Körös and Maros Rivers, on the plainland, roughly to the line of Világos before the Carpathian Mountains, east of which we find Coțofeni sites during the same period. In this case, then, we are dealing with a remarkable phenomenon: it has proved possible to identify a clear eastern boundary with an adjacent culture in the vast Baden distribution territory<sup>63</sup>.

### Time frame

A broader regional perspective can provide some of the answers. In the case of Hungary, the seemingly empty areas are later populated by other contemporaneous or partly contemporaneous cultures such as Pit Grave and Kostolác<sup>64</sup>.

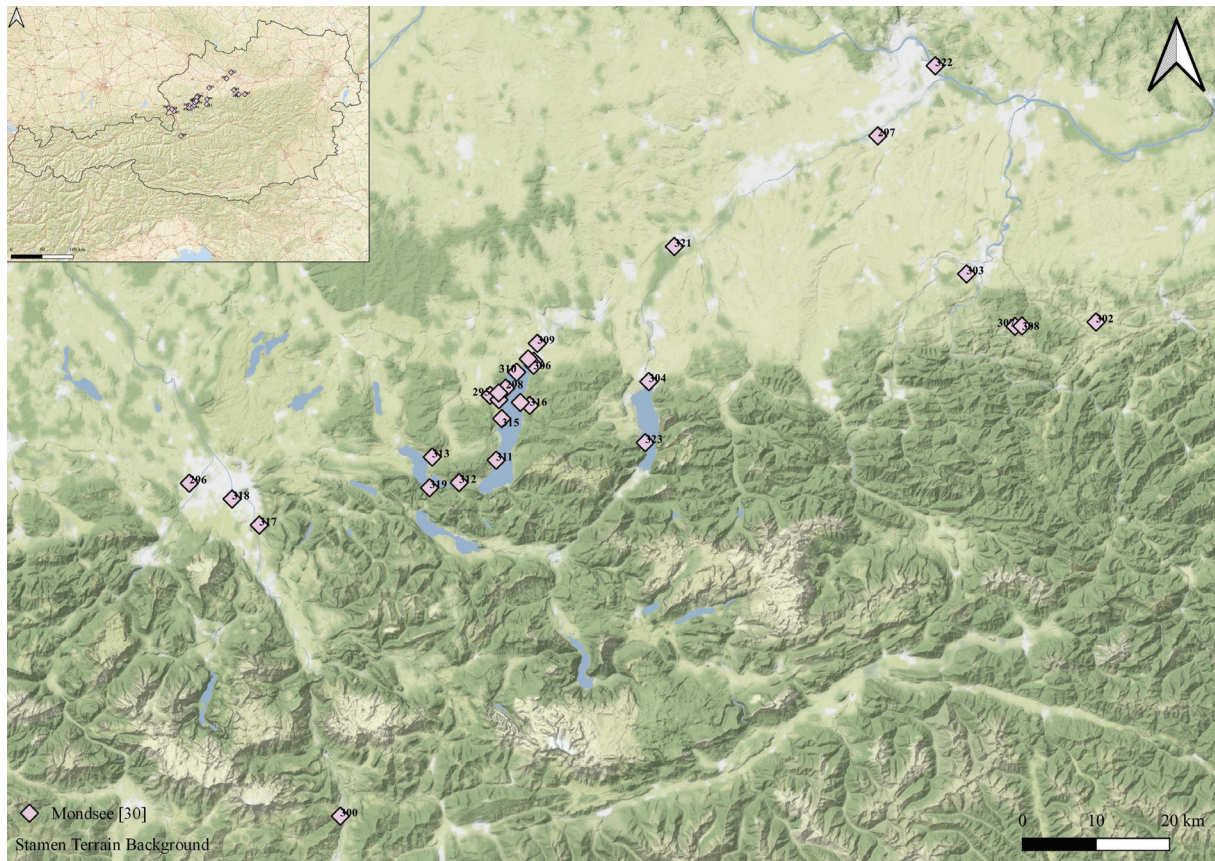


Fig. 2. Mondsee group in Austria ((basemap: Stamen Terrain Background).

In the case of Austria, the lake regions, particularly the Attersee and Mondsee in the *Salzkammergut* region, were settled by the Mondsee culture, a *Pfahlbau*-type culture, between 4000 and 2950/2800 BC (Mondsee I: 4000–3300 BC, Mondsee II: 3300–2950 BC, Mondsee III/Cham: 2950–2800 BC, Fig. 2)<sup>65</sup>. Mondsee imports have been found at Ossarn<sup>66</sup>. Their distribution (Boleráz, classic Baden and Mondsee) complemented each other (Fig. 3)<sup>67</sup>.

<sup>62</sup> In the Kerka Valley, Horváth 2014a, Chapter 4.

<sup>63</sup> Horváth 2018b, 235, Fig. 102.

<sup>64</sup> Horváth 2015a, 135, Fig. 4, 137, Fig. 5; Horváth 2016, Fig. 4.

<sup>65</sup> Ruttkay *et al.* 2004, 50–69; Krenn-Leeb *et al.* 2006, Abb. 2; Mayer 2008, Fig. 6.

<sup>66</sup> Bayer 1928, 88.

<sup>67</sup> Mayer 2008, Fig. 7.



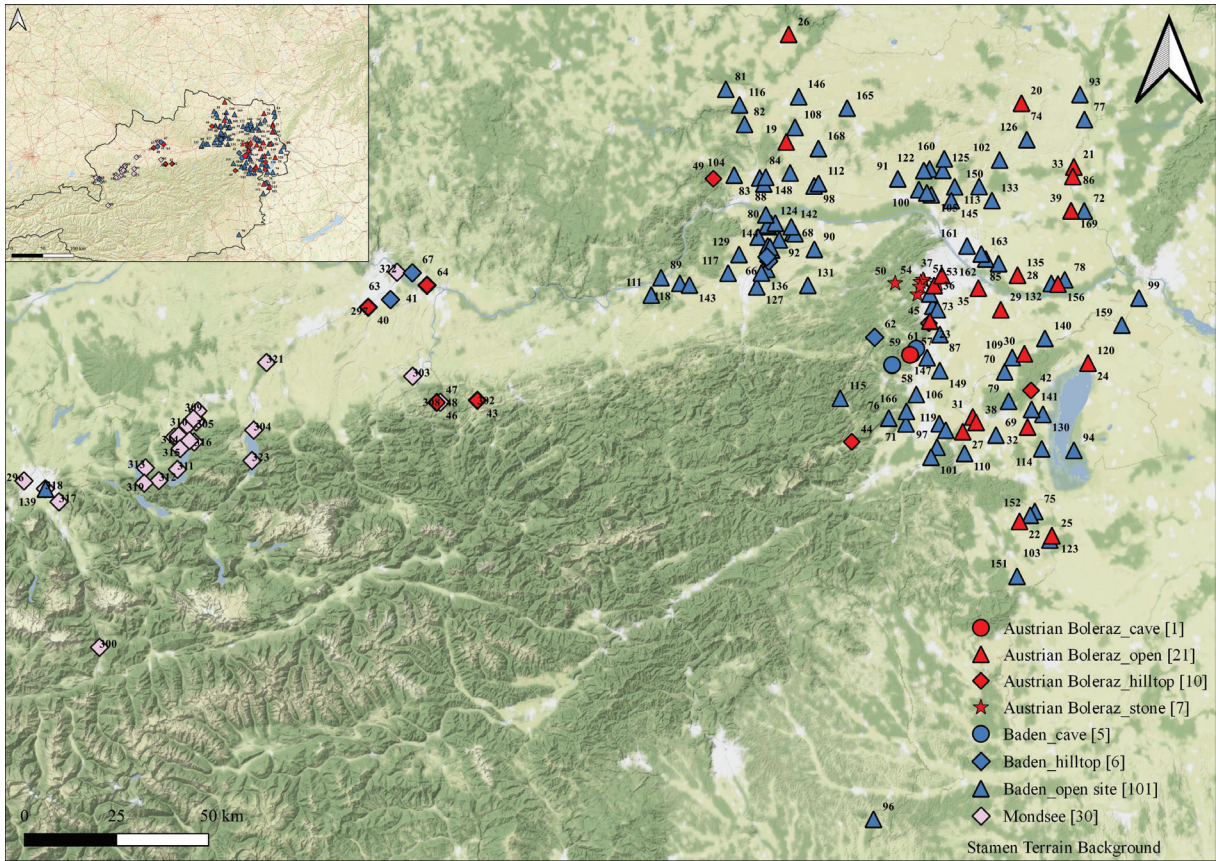


Fig 3. Mondsee group with Boleráz and Baden cultures in Austria (basemap: Stamen Terrain Background).

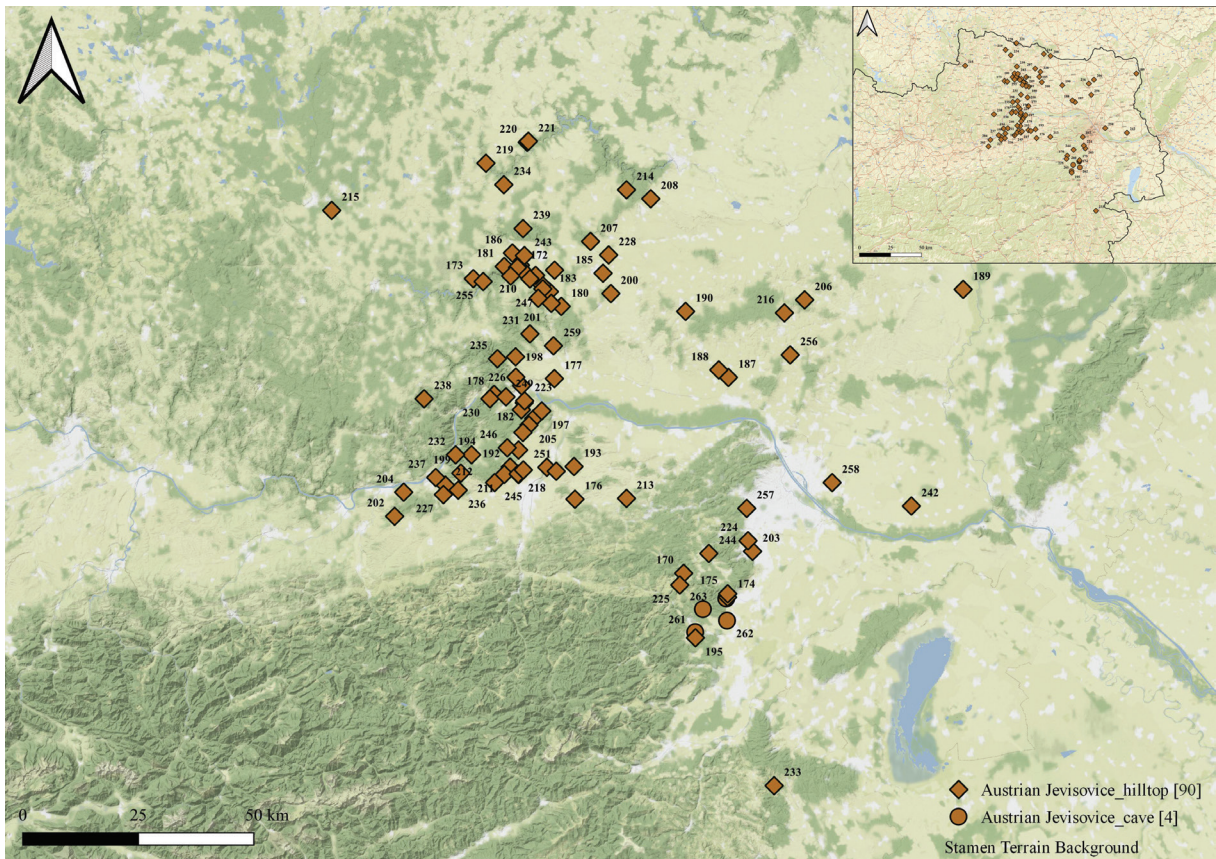


Fig. 4. Jevišovice culture in Austria (basemap: Stamen Terrain Background).



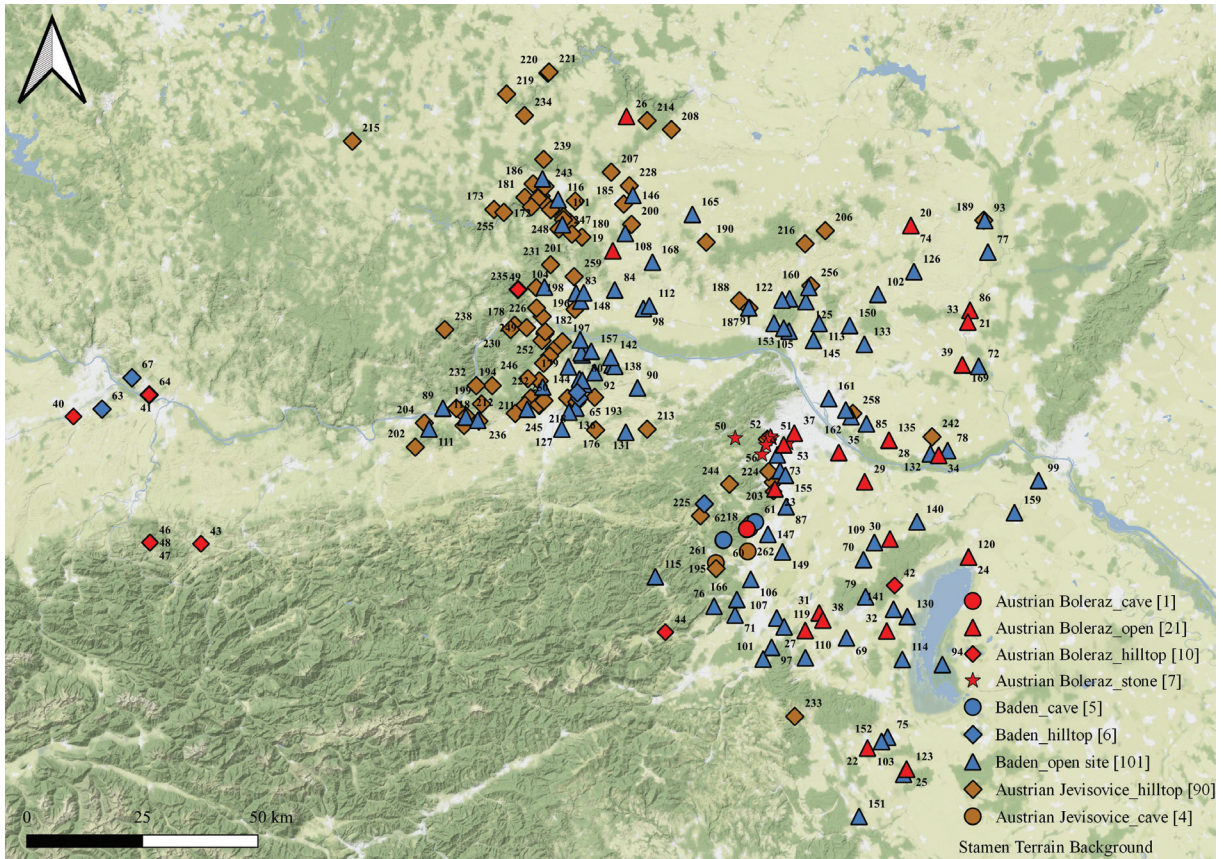


Fig. 5. Jevišovce with Boleráz and Baden cultures in Austria (basemap: Stamen Terrain Background)

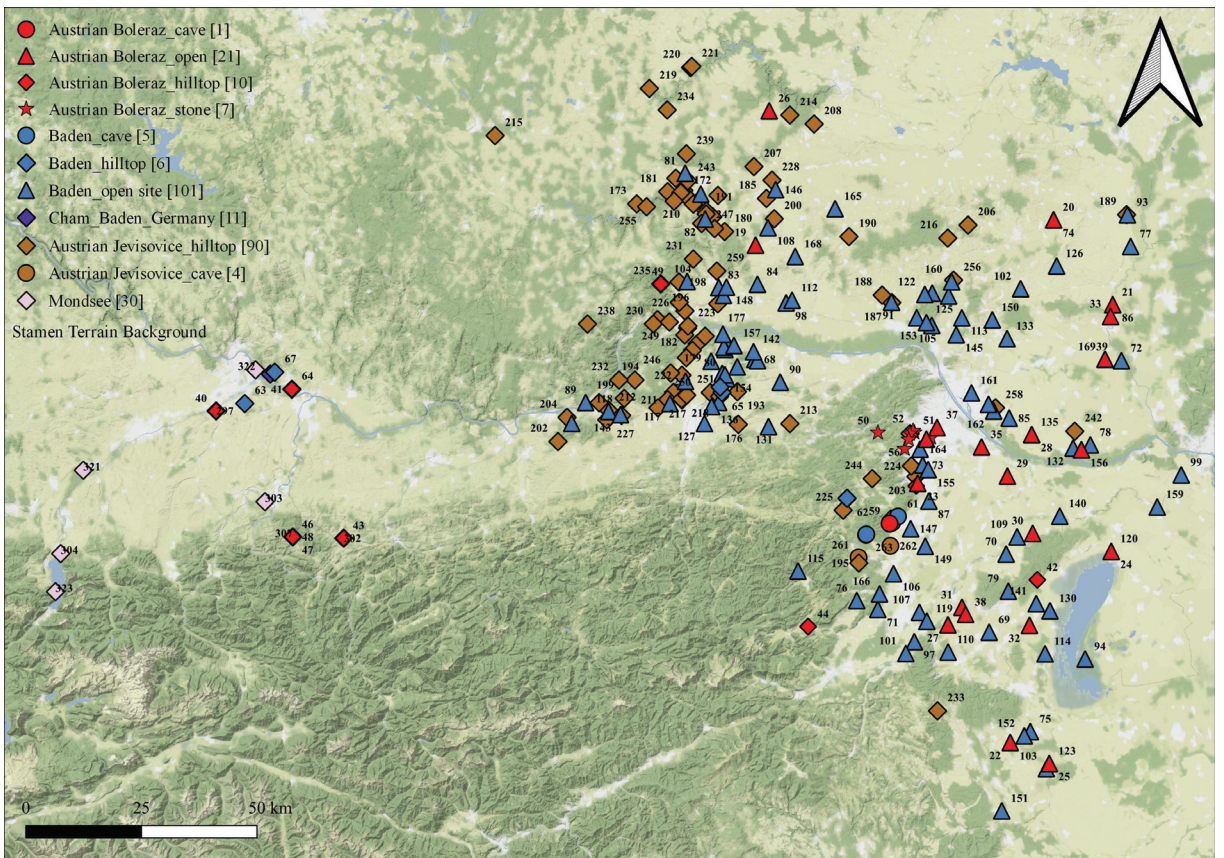


Fig. 6. Jevišovce with Boleráz, Baden, Mondsee and Cham in Austria (basemap: Stamen Terrain Background).



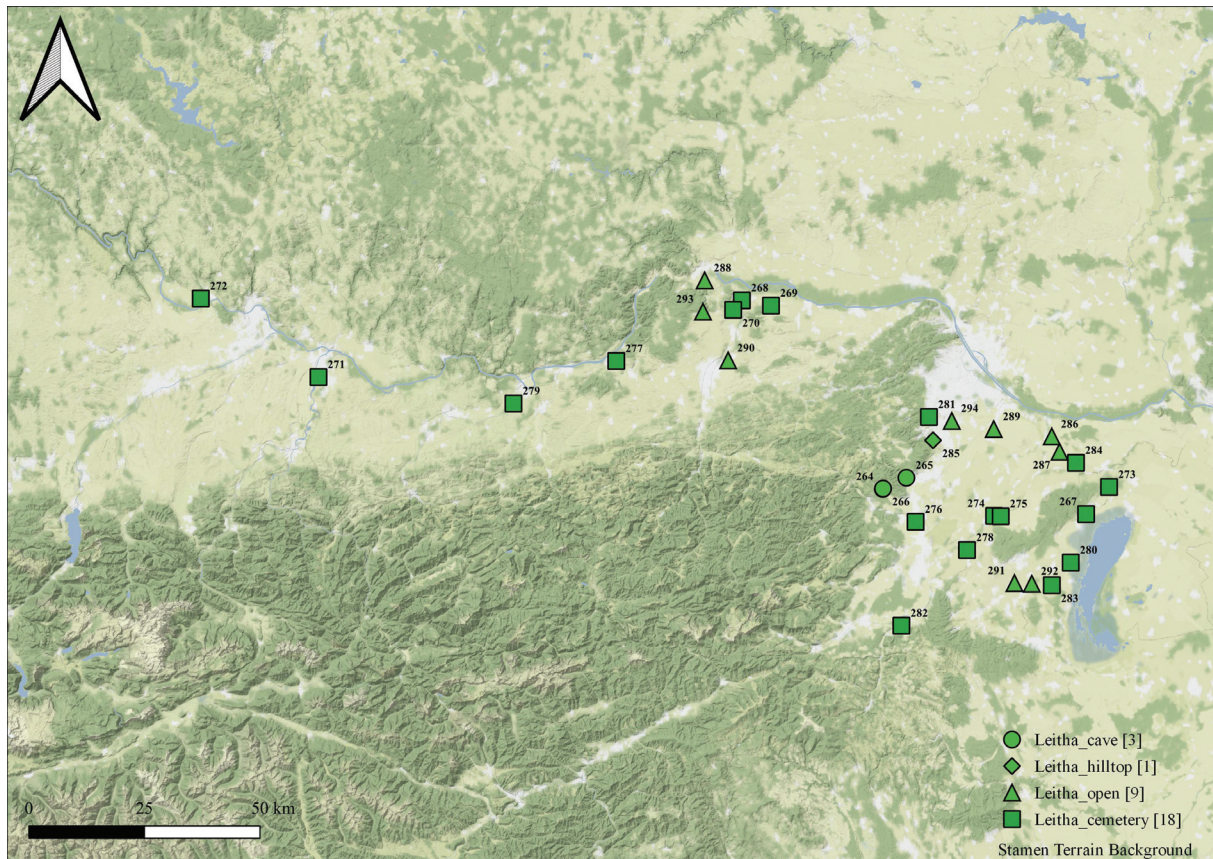


Fig. 7. Leithaprodersdorf group in Austria (basemap: Stamen Terrain Background).

A handful of Mondsee and Altheim sites appeared in the *Innviertel* (the Altheim culture flourished between 3800–3400 BC)<sup>68</sup>.

The early (Wachberg facies), the middle (Spielberg facies) and the classical Jevišovice culture (Mödling–Zöbing facies) was distributed in the *Waldviertel* and *Weinviertel* (Fig. 4), between 3100–2800 BC and overlapped with the Baden (and the Boleráz? Fig. 5)<sup>69</sup>, Mondsee and Cham distribution (Fig. 6)<sup>70</sup>. Its final phase (*Endphase*) can probably be correlated with the appearance of Makó–Kosihy–Čaka and the later Corded Ware<sup>71</sup>. New research show that the regional ware not only of Bell Beaker but also of Makó–Kosihy–Čaka develops into the ceramics of the Early Bronze Age, but already shows three regional differences or at least different influences. In Northern Lower Austria it changed slowly to Proto-Aunjetitz/Aunjetitz culture, in the south-eastern part of Lower Austria and *Burgenland* via Leithaprodersdorf-Group to Wieselburg Culture and in the Southwestern part of Lower Austria and the western part of Upper Austria via Leithaprodersdorf-Group/Unterwölbling I. to Unterwölbling culture (Fig. 7)<sup>72</sup>.

The Cham culture also appeared along the shores of the Attersee and Mondsee, in the plains of Upper Austria, and reached the Traisen Valley, overlapping with the distribution of the core territory of the Mondsee, and the periphery of the Baden complex and the Mödling–Zöbing group<sup>73</sup>. The early and the late Cham sites can be dated between 3300 BC and 2700 BC<sup>74</sup>.

The most recent Austrian radiocarbon date from Hatzenbach suggests that the terminal phase was a kind of transitional period between the Neolithic and Bronze Age with surviving Baden<sup>75</sup>.

<sup>68</sup> Matuschik 2001; Mayer 2008, Fig. 6, 9.

<sup>69</sup> Recent work on Jevišovice culture calls for a new internal division. The start date of its early phase is unknown in Austria. Therefore, according to a new, as yet unpublished radiocarbon series from the Boleráz hilltop site of Mödling–Jennyberg, some Boleráz sites can live in Austria until 3000 BC, so I left the Boleráz sites on the map as well.

<sup>70</sup> Krenn-Leeb 2006; Krenn-Leeb *et al.* 2006, Abb. 2.

<sup>71</sup> Schmitsberger 2006, 151.

<sup>72</sup> Kern *et al.* 2019, 189.

<sup>73</sup> Mayer 2008, Fig. 10.

<sup>74</sup> Krenn-Leeb *et al.* 2006, Abb. 2.

<sup>75</sup> VERA-730, 2821–2631 BC, 2  $\sigma$ : Horváth, Svingor 2015, Tab. 1.

This is the final phase of the Austrian *Endneolithikum*, represented by the earlier episode of Jevišovice/Ig I. in the *Burgenland* and the later one of Makó–Kosihy–Čaka in the Herzogenburg area and Wien, Bezirk 22<sup>76</sup>. The Makó sites are located along the Danube, roughly along the border with western Slovakia.

There are Baden elements beside the stronger Vučedol, Makó, Somogyvár–Vinkovci and Pit Grave elements in the tumulus grave of Neusiedl–Kalvarienberg.<sup>77</sup> This is the full picture of the period of the Baden complex in Austria.

### Site types

In Hungary, a number of Baden sites have been described as being hilltop, fortified settlements since decades. During my grant, I was able to review two of the most interesting sites of this type in the north-easterly region of the Baden complex, where the so-called Ózd–Piliny group is distributed (Ózd–Kőalja-tető, Salgótarján–Pécs-kő). As it turned out, the sites were neither fortified, nor did they have tell-like stratified layers; they are open settlements mainly with pits and some hearths/ovens on higher-lying plateaus, no higher than 450 m. They were exactly the same as the simple pits and heating installations on other open settlements located in areas up to an elevation of 350–400 m<sup>78</sup>. At the same time, I cannot say anything about the still unpublished possible Baden hilltop sites in southern Transdanubia. The published data merely indicate their presence, but do not confirm whether they are multi-layered or fortified settlements. They also reveal that Vučedol succeeded the classical Baden period<sup>79</sup>.

While no Boleráz hilltop settlements are known from Hungary, their existence is securely attested in Austria (Laussa area in the Enns Valley: Rebensteiner Mauer, Langensteiner Wand<sup>80</sup>; Vienna Basin: Mödling–Jennyberg, Mödling–Anninger (?), Mödling–Frauenstein, Schanzriedl bei Sentftenberger Amt, Wien Bez. 13, Gemeindeberg, Grünbach–Hausstein, Muggendorf–Hausstein<sup>81</sup>), and in Moravia<sup>82</sup>. Grünbach am Schneeberg and Hochneukirchen lie above 800 m.

There are some Baden hilltop settlements in the Semmering area, along the boundary between Lower Austria and Styria, all located above 800 m<sup>83</sup>.

Boleráz and Baden cave sites are known both in Hungary and in Austria, interpreted as an indication of traces of shifting cultivation in this higher zone<sup>84</sup>.

Some of the Hungarian<sup>85</sup> and Austrian settlements yielded human skeletal remains<sup>86</sup>; at the same time, we also know of a few formal extramural cemeteries<sup>87</sup>. Some of these formal extramural cemeteries were associated with a settlement in its close vicinity<sup>88</sup>, while the burial grounds at Alsónémedi<sup>89</sup>, Budakalász<sup>90</sup> and Pilismarót<sup>91</sup> appear to have been formal, separate cemeteries without an associated settlement.

The number of Baden sites is higher than Boleráz in both countries and the classical Baden distribution is more extensive than the Boleráz one: classical Baden was more expanded and populous in time and space.

<sup>76</sup> Essling: Pit Grave and Bell Beaker, complemented with Corded Ware, Ruttkey 1999, 178; Zimmermann 2003.

<sup>77</sup> *Neusiedl-Fazies*: Ruttkey 2002; Ruttkey 2003.

<sup>78</sup> Horváth 2018a.

<sup>79</sup> Zók–Vár-hegy: Ecsedy 1982.

<sup>80</sup> Mittelkalkgruber 1992.

<sup>81</sup> Ruttkey 1999, 146; Ruttkey 2001; Hrodegh 1919.

<sup>82</sup> Zápotoczký 2000.

<sup>83</sup> Not discussed in detail, Mayer 2008: 171, perhaps Pitten, and e.g. Neidling and Obergänsersdorf, not far from St. Pölten.

<sup>84</sup> The eponymous site at Baden–Königshöhle and Bojerhöhle, Felsensitzhöhle, Merkensteiner Höhle, Winsloch and Gainfarn: Mayer 1985; Klemm 1985 and other caves: Ruttkey mit Beitrag von Mayer 1999, 168; for the Hungarian cave sites, see György 2012.

<sup>85</sup> Horváth 2004, 73–75.

<sup>86</sup> Ruttkey 1999, 148; Ruttkey mit Beitrag von Mayer 1999, 174.

<sup>87</sup> Korek *et al.* 1951; Bondár, Raczky 2009; Farkas 2004; Nagy 2010; Bondár 2015; Krumpel *et al.* 2008; Mayer 2008, Fig. 3.

<sup>88</sup> E.g. Balatonlelle: Nagy 2010, Vámosgyörk: Farkas 2004; Ratzersdorf: Krumpel *et al.* 2008.

<sup>89</sup> Korek *et al.* 1951.

<sup>90</sup> Bondár, Raczky 2009.

<sup>91</sup> Bondár 2015.



### The Boleráz distribution (Jungneolithikum, Figs 8–9)

Of the 152 sites of the Baden complex, only 44 can be assigned to Boleráz (Figs 8–9) or represent a joint Boleráz–Baden occupation (with double numbers in the table, see Fig. 9)<sup>92</sup>. The situation is similar in Hungary: of the *cca.* 700 sites, only 87 are Boleráz, while a further 61 sites had a joint Boleráz–Baden occupation<sup>93</sup>.

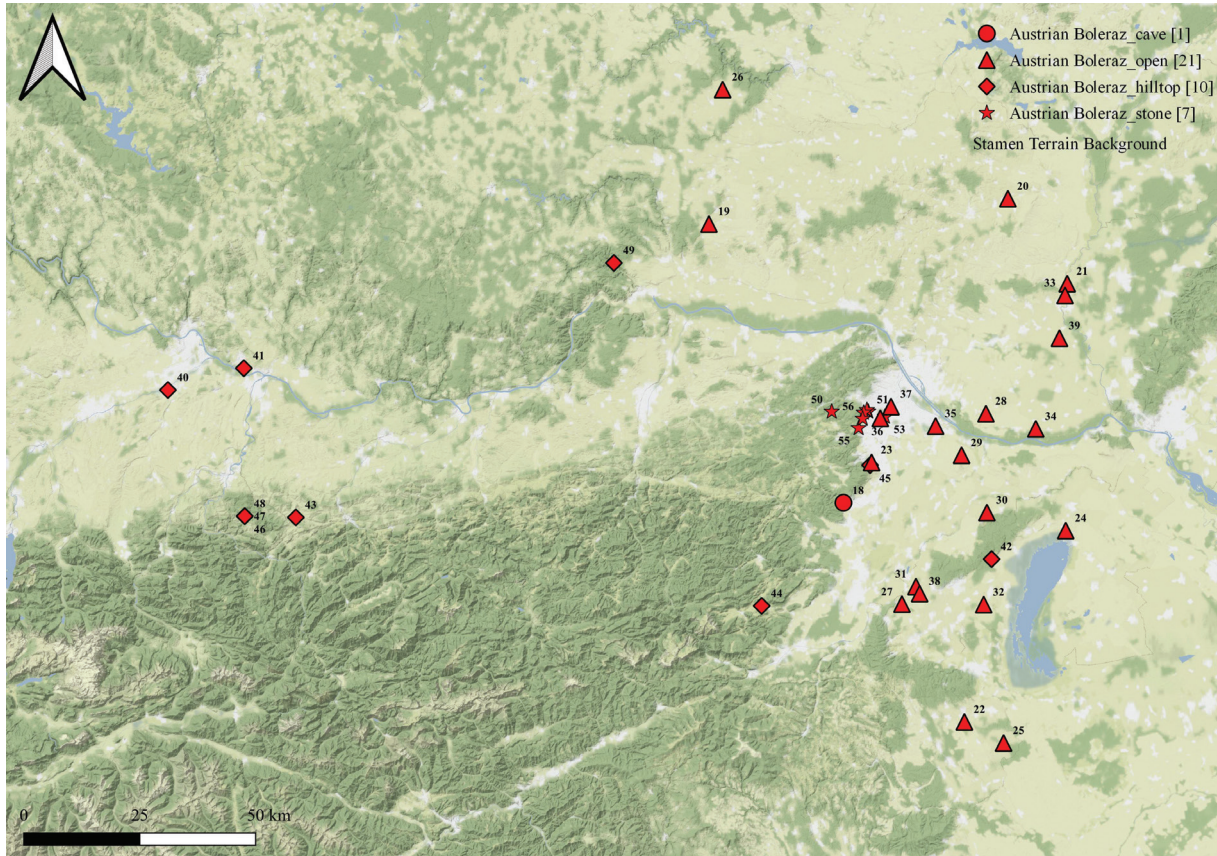


Fig. 8. Boleráz culture in Austria (basemap: Stamen Terrain Background).

Fig. 9. Boleráz sites in Austria.

Nr.	Site name	Literature	Notes	Site type
18=59.	Baden–Königshöhle	Klemm 1985, 90; Mayer 1985	From Boleráz til Kostoláč.	Cave site.
19.	Baierdorf	Ruttkay 1999a	1 or 2 pits.	Open settlement.
20=74.	Bullendorf	FÖ 45, 633.	Boleráz–Baden settlement.	Open settlement.
21= 14=85.	Grub and der March–Unterhaspel	Hahnel 1992	Grave 2: cremated urn- grave, Ia phase; Another grave: Classic Baden. Baalberg-Furchenstich and Boleráz settlement site also.	Open settlement with burials.
22.	Horitschon/Haracsony	FÖ 23, 223.		Open site.
23.	Mödling– SpitalmühlgaÙe 15–17.	FÖ 1977, 361–363.		Open site.
24.	Neusiedl am See/ Nezsider–Windmühle	Foltiny, Ohrenberger 1952	Coherent with Fundstelle II?	Open settlement.
25=123.	Nikitsch/Füles	FÖ 34, 604.	Boleráz–Baden Ossarn I. settlement.	Open settlement.
26.	Pleissing	Ruttkay 1999a		Open site.

<sup>92</sup> Mayer 2008, Fig. 2.

<sup>93</sup> Horváth 2015a, 132, Fig. 4; Horváth 2016, 82–87.

Nr.	Site name	Literature	Notes	Site type
27.	Pötsching	Hahnel 1992	With a female grave at the site.	Open settlement with burial.
28=135.	Probstdorf–Nord	Schmitsberger <i>et al.</i> 2004, 194.	From Boleráz to Ossarn I.	Open settlement.
29.	Schwechat	Ruttkey 1971b	2 pits.	Open settlement.
30.	Sommerein	FÖ 16, 323.	Pits.	Open settlement.
31.	Stickenbrunn/ Steinbrunn/Büdöskút	FÖ 2, 231.		Open site.
32.	St. Margarethen/ Margittabánya	Hahnel 1992	With a crouched skeleton at the site.	Open settlement with burial or cemetery?
33.	Stillfried–Flur Auhagen	FÖ 42, 640.		Open settlement.
34=156.	Wagram and der Donau–Gangerfeld	Schmitsberger <i>et al.</i> 2004, 194.	From Boleráz to Ossarn I.	Open settlement.
35.	Wien Bez. 11. Csokorgaße	Penz 2014	Pit.	Open settlement.
36.	Wien Bez. 12. Jägerhausgaße 11–13.	Ruttkey 1999a	Pit.	Open settlement.
37.	Wien Bez. 7. Gumpendorferstraße	Kriegler 1930	Pit.	Open settlement.
38.	Zillingtal/Völgyfalva	Hahnel 1992; Heiling-Schmoll 1985	With a trepanated skull in a pit.	Open settlement with human remain.
39=168.	Zwerndorf–Dornplatz	Schmitsberger <i>et al.</i> 2004, 194; Leeb 1989	From Boleráz til Kostolác.	Open site.
40.	Ansfelden–Burgwiese	Trebsche 2008	Cham–Mondsee–Boleráz	Hilltop settlement.
41=7.	Berglitzl–Langenstein bei Gusen	Schmitsberger 1992	Baalberg B–Proto-Boleráz/ (Boleráz?)–Michelsberg	Hilltop settlement.
42.	Donnerskirchen/ Fertőfehéregyháza– Unterer Kreutberg	Kaus 1984	Vessel-depot from the hill- top site.	Hilltop settlement.
43.	Ertl–Sweighofer Mauer	Maurer 2010	Cham–Mondsee–Boleráz	Hilltop settlement.
44.	Grünbach am Schneeberg–Hausstein	Daim, Ruttkey 1981	Boleráz–Mondsee	Hilltop settlement with Mondsee-imports.
45.	Mödling–Jennyberg	Ruttkey 2001		Hilltop settlement.
46.	Garsten–Rebensteiner Mauer	Mittelkalgruber 1992	Cham–Mondsee–Boleráz	Hilltop settlement.
47.	Laussa–Langensteiner Wand	Mittelkalgruber 1992	Cham–Mondsee–Boleráz	Hilltop settlement.
48.	Laussa–Prücklermauer?	Mittelkalkgruber 1992	Mondsee (with Boleráz?)	Hilltop settlement.
49.	Senftenberg– Schanzriedl	Hrodegh 1919; Schmitsberger 1992, 34.	Baalberg–Proto-Boleráz– Boleráz, Jevišovice; or Jevišovice with Globular Amphora/Bernburg?	Hilltop settlement.
50.	Baunzen–Purkersdorf	Brandl <i>et al.</i> 2018	Stone exploitation, Vienna cliff zone radiolarite.	Mining place.
51.	Wien–Roterberg	Schmitsberger <i>et al.</i> 2019	Stone exploitation, Vienna cliff zone radiolarite.	Mining place.
52.	Wien–Girzenberg	Schmitsberger <i>et al.</i> 2019	Stone exploitation, Vienna cliff zone radiolarite.	Mining place.
53.	Wien–Flohberg	Schmitsberger <i>et al.</i> 2019	Stone exploitation, Vienna cliff zone radiolarite.	Mining place.
54.	Wien–Gemeindeberg	Schmitsberger <i>et al.</i> 2019	Stone exploitation, Vienna cliff zone radiolarite.	Mining place.
55.	Wien–Antonshöhe- Mauer	Schmitsberger <i>et al.</i> 2019	Stone exploitation, Vienna cliff zone radiolarite.	Mining place.
56.	Wien–Lanzer Tiergarten	Schmitsberger <i>et al.</i> 2019	Stone exploitation, Vienna cliff zone radiolarite.	Mining places, more sites.



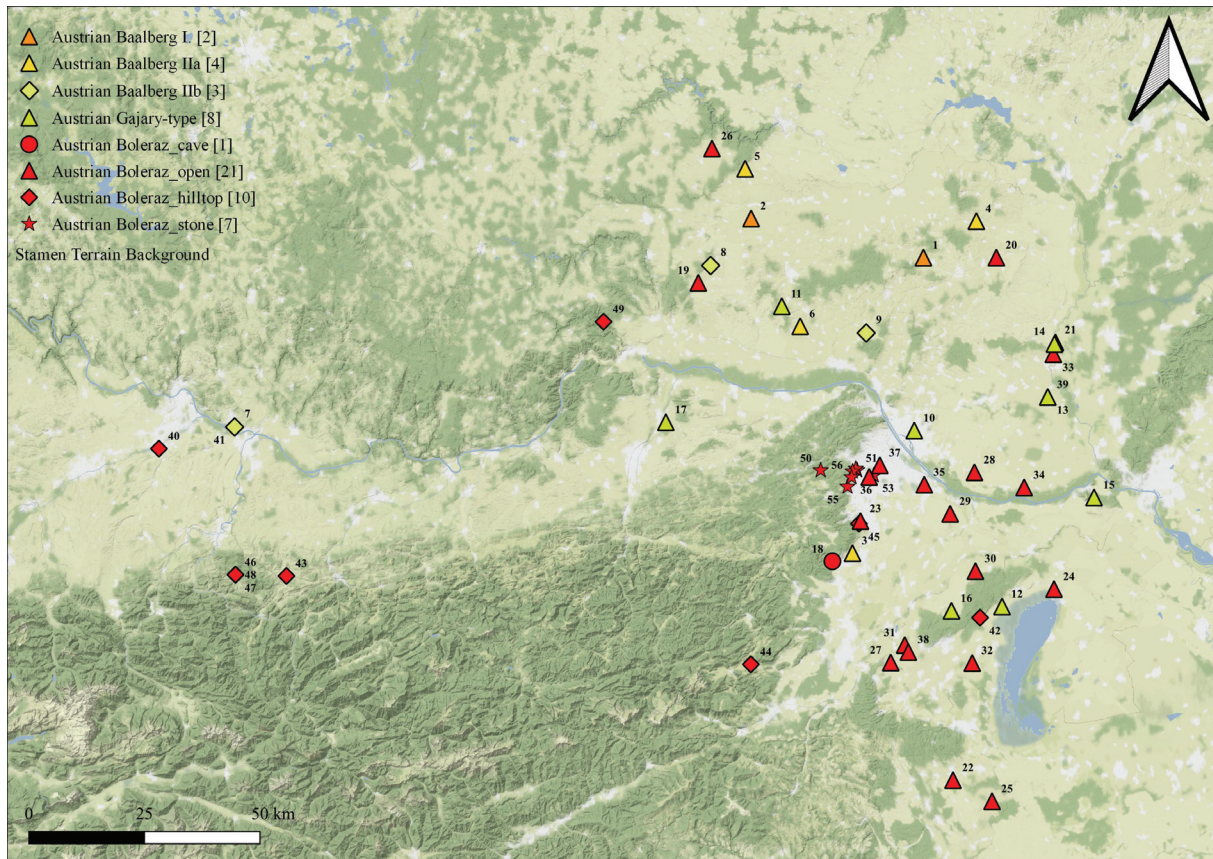


Fig. 10. Baalberg and Boleráz cultures in Austria (basemap: Stamen Terrain Background).

Most of the sites lie in southern Danubian Lower Austria, northern Burgenland, the Leitha and the March regions, and the eastern Wienerwald. Only two sites (Baierdorf and Pleissing) are known in the northern-Danubian part of Lower Austria. There are two sites in the Laussa area in Upper Austria, which appears to be an isolated enclave.

The sites of the preceding period are located in the Waldviertel and Weinviertel<sup>94</sup>, along the border with Moravia, although a few sites appeared along the Danube, up to the Purbach line in Burgenland (Fig. 10)<sup>95</sup>. On the testimony of the radiocarbon dates from these sites, including the earliest Boleráz ones (e.g. Schwechat, Grub an der March, Niederhollabrunn), these periods overlapped with each other in time and in space. This region and the preceding archaeological groups may represent the cradle of Boleráz in Moravia. This transition has been detected in Moravia<sup>96</sup>, but not yet on the Austrian sites<sup>97</sup>. This situation can change in the future because we know of a Ia Protoboleráz grave from Grub an der March.

In Lower Bavaria, the transition between the Münchshöfen culture, which was strongly influenced by the Lengyel culture, and the Altheim culture, which mainly received impacts from the Funnel Beaker culture, has for the first time been identified and tentatively named the *Wallerfing facies* by Rudolph A. Maier. During the same time period, the new site at Mamming indicates a local group comparable to Wallerfing, although betraying a much greater influence from the Funnel Beaker culture. It seems curious, at least at first sight, that both Late Neolithic finds and the pottery of the Ossarn group of the Baden culture occur together in the same pit and the same layer, for according to the conventional chronology, there should be a greater interval between these cultures. Nevertheless, a look at the contemporary Bohemian (and Swiss) sites raise the possibility that the impact of the Baden culture on the Lower Bavarian Late Neolithic may have started much earlier than previously assumed<sup>98</sup>.

<sup>94</sup> Jungneolithikum: Baalberger Gruppe mit Furchstichkeramik, Typus Retz, e.g. Olgersdorf, Ruttkay 1971, and Gemischte Gruppe mit Furchenstichkeramik, Typus Bajč, e.g. Puch-Scheibelfeld, Ruttkay 2006.

<sup>95</sup> E.g. Wien, Bez. 21, Eipeldauerstrasse, Mayer 2008, Fig. 9.

<sup>96</sup> Šmíd, Kalábková 2015.

<sup>97</sup> Ruttkay 1999, 136.

<sup>98</sup> Kreiner 1993.

The situation is the same in Hungary as in Austria regarding the radiocarbon-dated Hunyadihalom/Lažňany and Furchenstich sites<sup>99</sup>: their radiocarbon dates overlap with the dates for some of the earliest Boleráz sites, but there is no evidence for any interaction between them on any one site.

The late Lasinja II–Kanzianiberg *Pfahlbau*-type settlements along the Keutschacher See (Carinthia) were not affected by the initial Boleráz chronological horizon and did not participate its formation or have any interactions with Boleráz since their sequence ended before 3700 BC<sup>100</sup>.

A grave uncovered at Grub an der March represents the earliest Boleráz feature in Austria (Phase Ia, Proto-Boleráz). The location of the site and the early funeral tradition signals the Moravian connection and influence of the already evolved Boleráz.

Neither formal extramural, nor intramural cemeteries are known, although a few graves have been found (a crouched burial with stone packing and an inurned cremation burial, St. Margarethen, Grub an der March, maybe Pöttching)<sup>101</sup> alongside a manipulated skull from a settlement pit at Zillingtal.

The spread of Boleráz towards Hungary can be taken for certain in view of the highly similar typological forms and the earliest radiocarbon dates for Boleráz from the Szombathely area<sup>102</sup>.

The cultures coeval with Boleráz in Austria were Altheim and Mondsee and sites of the classic Baden and early Jevišovice.

### **Transitional phase IIA, and/or sites occupied jointly by Boleráz and Baden, or Boleráz and Baden between 3350 and 3000 BC (Jungneolithikum)**

In Hungary, there are 61 sites occupied jointly by Boleráz and Baden among the *cca.* 700 sites of the Baden complex<sup>103</sup>. Most of them were identified during the field surveys undertaken as part of systematic topographic work:<sup>104</sup> it seems possible that the reason for the “belief” in jointly occupied sites was the scarcity of data owing to the lack of excavations and the occurrence of both cultures’ pottery on the same site. A few of these sites have been recently excavated as part of large-scale salvage excavations<sup>105</sup>. Only one of these has been fully evaluated and published<sup>106</sup>.

The new evidence is at variance with Němejcová-Pavúková’s widely accepted opinion that Boleráz was the initial, organic phase of the Baden culture<sup>107</sup>. The new, excavated sites and the mapping of others outlines a somewhat different picture<sup>108</sup>.

There are joint sites where the two occupations were located directly beside each other, forming one archaeological site, with interaction between the two communities, which nevertheless maintained their separatedness from each other as individual village cores (Balatonőszöd, Szurdokpüspöki). The absolute chronology of the occupations proved that they overlapped from 3370/3350 BC, when Baden appeared.

There are joint sites with a different occupation pattern, but their assessment is still in progress (Balatonlelle, Balatonboglár, Balatonkeresztúr: the Boleráz and Baden features occurred among each other, and were not spatially separated).

There are regions with Boleráz and Baden sites in close proximity to each other, but without forming one site (Counties Pest and Komárom-Esztergom, e.g. Pilismarót–Szobi-rév, a Baden settlement, and Pilismarót–Basa-harc, a formal extramural Boleráz cemetery lying a few kilometres away). The radiocarbon dates for the sites indicate that they overlapped between 3370/3350–2800 BC<sup>109</sup>.

This is a different pattern than the one in the southern Balaton region, where Boleráz and Baden co-residence could be noted on one site. Between 3370/3350 BC and 3000/2800 BC, there were some separate Boleráz (surviving Boleráz) and new Baden sites that were not occupied jointly.

<sup>99</sup> Horváth 2014a, Section 3.3.15; Horváth 2018a, 70–79.

<sup>100</sup> Ruttikay 1996; Cichocki, Dworsky 2006.

<sup>101</sup> Hahnel 1992.

<sup>102</sup> Horváth 2017a.

<sup>103</sup> Horváth 2015a, 132; Horváth 2016, 104, Fig. 3.

<sup>104</sup> E.g. Torma 1969.

<sup>105</sup> E.g. Balatonőszöd, Balatonboglár: Honti 1981, Balatonlelle: Nagy 2010; Balatonkeresztúr: Fábíán 2013; Szurdokpüspöki: Horváth *et al.* 2018a.

<sup>106</sup> Balatonőszöd, Horváth 2014.

<sup>107</sup> Němejcová-Pavúková 1964; Němejcová-Pavúková 1974, 238.

<sup>108</sup> Horváth 2009, 108–109; Horváth 2015a, 132–139; Horváth, Svingor 2015, 33–36.

<sup>109</sup> Pilismarót–Basa-harc and Budakalász–Luppa-csárda, Bondár 2015; Bondár, Raczky 2009; Horváth 2016, Horváth 2017c.



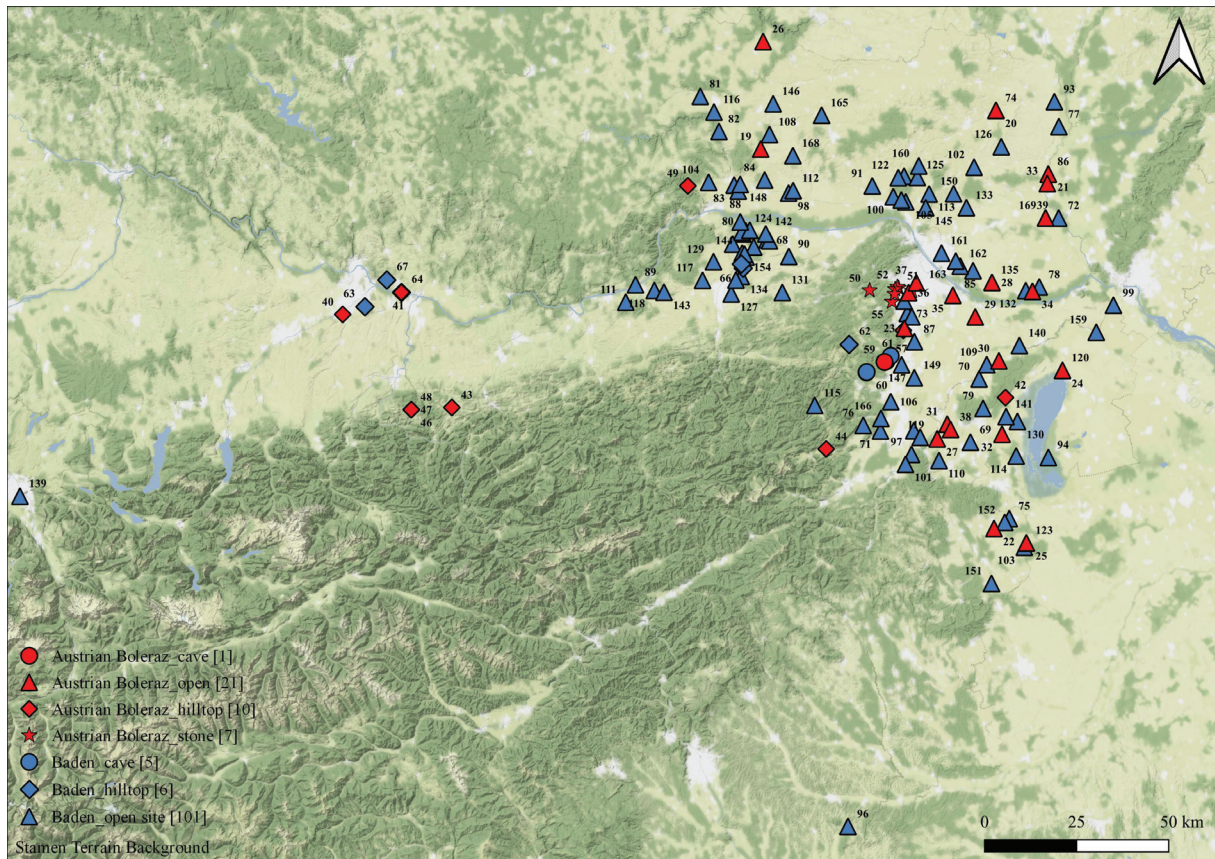


Fig. 11. Boleráz and Baden cultures in Austria (basemap: Stamen Terrain Background).

Finally, there are regions where Boleráz sites are entirely lacking (e.g. the Budapest area in County Pest). This marks the Baden expansion as well as some form of surviving Boleráz after 3370/3350 BC, rather than a clear organic development between them.

From a typological point of view, it is very difficult to define and fill the transition phase with vessel shapes and types of decoration.

From an absolute chronological point of view, we know of some Boleráz radiocarbon dates from the Pilismarót cemetery that are calibrated to less than 3350 BC, reaching 3000 BC, and even 2800 BC<sup>110</sup>.

The situation in Austria is similar. There are far fewer sites with Boleráz–Baden traces<sup>111</sup>. Following the critical review of the finds, most turned out to be pure Baden sites without Boleráz traces or influence: spoils, herringbone patterns and other forms and decorations which Christian Mayer associated with Boleráz are also common in the classical Baden and are not culture-specific to Boleráz<sup>112</sup>.

The location of the jointly occupied sites shows a concentration in Burgenland, the Vienna Basin and along the border with south-western Slovakia. If this was indeed the case and not merely a reflection of a research gap, it would imply that the Boleráz/Baden transition took place south of the formation of Boleráz (located in the border area between Austria and Moravia, in the *Weinviertel*) and that the contact zone of the transition lay in the southern Danubian regions of Lower Austria.

Unfortunately, only brief preliminary reports are available for these sites, and not fully assessed data, meaning that after their assessment, this picture will be enriched with finer details or will turn out to be a wholly different one. Similarly to Hungary, it is difficult to pinpoint the transition phase between Boleráz and Baden (the so-called IIa phase)<sup>113</sup>. Some of the Austrian sites seemingly began with

<sup>110</sup> Hamilton 2015: SUERC–45840, 45841, 45849, 45850, 47879, Grave Nrs. 358, 364, 388, 399, 409B. Unfortunately, the results of unusual radiocarbon measurements were not interpreted in the archaeological interpretation.

<sup>111</sup> E.g. Bullendorf, Drösing, Grub an der March, Hohenau an der March, Nikitsch, Ort an der Donau, Unterrohrbach, Wagram an der Donau, Zwerndorf, see Mayer 2008, 168.

<sup>112</sup> For a detailed discussion, see Horváth 2014a, Section 3.3.14.

<sup>113</sup> Mayer 1999, 162–163; Mayer 2008, 168.

this IIA phase, but lack a pure Boleráz Ia-b-c horizon/occupation/phases (e.g. Kittsee, Mannersdorf, Ossarn, Pottabrunn, Probsdorf, Stillfried, Unterloisdorf).

I would like to emphasize that there is no clear-cut evidence that Boleráz was an organic antecedent of the Baden. It is my conviction that we will have to re-consider the Boleráz–Baden development in the future – however, the necessary basic information will come from Slovakia and not from Hungary, Austria or Moravia. They overlapped in time and space, this being the main reason that we initially designated them a prehistoric culture complex. However, it is now clear that this is not the case. Nevertheless, we need more data to describe this process and to construct a new model incorporating the data.

The available Austrian radiocarbon dates do not indicate the survival of Boleráz after 3370/3350 BC in Austria. This is a major difference compared to the chronology of Hungary<sup>114</sup>, although it could be the reflection of a research gap too. If this was indeed the case, it is a clear indication that Boleráz was replaced by Baden without any interaction and co-residence between the two.

A single micro-region is examined in more detail in Austria: the Mödling area (my ongoing Stand Alone Project). The radiocarbon measurement series of the hilltop settlement of Jennyberg Boleráz lasts up to 3000 BC, so we already have a surviving Boleráz settlement in Austria.

At the foot of the hilltop settlement, at No. 10 Goldene Stiege, a part of Baden settlement without Boleráz was found, whose radiocarbon measurements are as old as Jennyberg between 3300 and 3000 BC.

In this region, therefore, Boleráz and Baden lived side by side as two separate archeological cultures between 3350 and 3000 BC.

Starting from this, when we talk about the transition between Boleráz and Baden, perhaps it is right to talk about two cultures living side by side from 3350 BC (Fig. 11).

### Classical Baden/Ossarn I distribution (Jungneolithikum, Figs. 12–13)

Austrian archaeological scholarship distinguishes two horizons within classical Baden: Ossarn I and Ossarn II–Lichtenwörth, the latter being late Baden with Kostolác-like pottery<sup>115</sup>.

Unfortunately, very few excavated Austrian sites have been published<sup>116</sup>, meaning that the information available for the sites is scarce in every aspect. When attempting to create separate maps of the Baden complex, this poses a great problem:<sup>117</sup> most of the sites lack a finer chronological or cultural assignation. The distribution map of the sites of Austrian Baden according to their chronological position reveals concentrations in Lower Austria along the River Traisen, in central and northern *Burgenland*, and in the north-eastern parts of Lower Austria along the River March. Currently, no Baden sites are known from regions such as the central *Weinviertel* and the eastern *Waldviertel*, although both regions are known for their mass of prehistoric sites. A similar lack of Baden sites can be noted in the region south-east of Vienna and east of Lake Neusiedler in *Burgenland*. Hence, the actual spatial distribution of the sites probably reflects the fieldwork and research activities of different researchers and institutions rather than a cultural phenomenon<sup>118</sup>. The lack of sites most likely conforms the prehistoric situation; the southernmost boundary of the Baden culture is located in the hills south-west of Oberpullendorf that separate the middle part of *Burgenland* from the southern part. The determination of the western boundary of the Austrian Baden distribution is much more difficult. There are two sites in Upper Austria near Linz<sup>119</sup>, the other at Rebensteiner Wand, about 30 km south of Linz<sup>120</sup>. Both sites lie at a great distance from the majority of the sites in the Baden heartland and are separated from the other Baden sites by a region where archaeological activity has been low.

In Hungary, only one clear boundary can be detected in the spread of the Baden complex toward west, namely in County Zala:<sup>121</sup> in the country's other regions – along the lowlands – the culture complex extended to geographical boundaries, without “stopping” at the modern borders between countries.

<sup>114</sup> Horváth, Svingor 2015.

<sup>115</sup> Ruttkay 1985, 36; Mayer 1990.

<sup>116</sup> Ossarn–Grasberg: Bayer 1928; Mayer 1996, and partly Lichtenwörth–Oberes Kreuzfeld: Mayer 1983.

<sup>117</sup> See, e.g., Mayer 2008, Fig. 2.

<sup>118</sup> Mayer 2008, 169–171.

<sup>119</sup> Langenstein–Berglitzl, Ebelsberg–Wachtberg: Pertlwieser, Tovornik 1970, 15, Taf. IV.1.

<sup>120</sup> Mitterkalkgruber 1992, 36.

<sup>121</sup> Kerka Valley, Horváth 2014a, Chapter 4, 617.



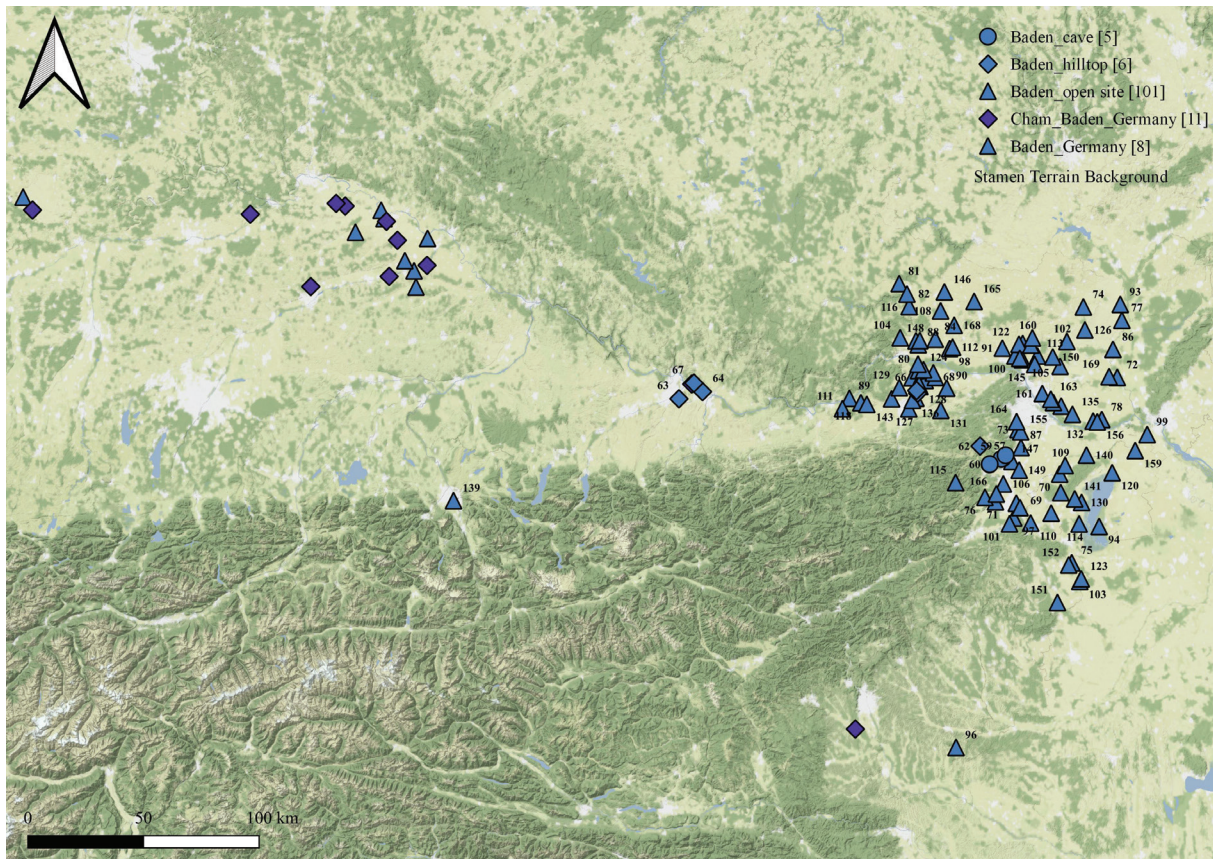


Fig. 12. Baden culture in Austria and Germany (basemap: Stamen Terrain Background).

Most of the known sites are settlements, often with skeletal remains in the settlement pits or a cemetery section near the settlement<sup>122</sup>, but there are no known formal extramural cemeteries resembling the ones at Budakalász–Luppa-csárda and Alsónémedi in Hungary. The vast majority of the sites are located in regions below 350 m. Thus, we may safely assert that Baden is a culture of the lowlands and that the lack of sites in the Waldviertel does actually reflect the prehistoric situation in this region. Of course, there are some exceptions to this such as the sites in the Semmering region south of Vienna, along the boundary between Lower Austria and Styria, that are located at altitudes of up to 800 m, generally close to copper deposits.

The earliest radiocarbon dates come from Girm (Pit 2) and Baierdorf, both before 3350 BC. Deutschkreuz–Girm is unpublished, but Baierdorf appears in Elisabeth Ruttkay's list of Boleráz sites<sup>123</sup>. The earlier dates thus possibly represent the earlier, Boleráz horizon of the Baden complex and not classical Baden. Thus, Baden began around 3370/3350 BC in Austria, similarly as in Hungary and other countries.

The neighbours of classical Baden were the Mondsee II/III, Jevišovice (early, middle and late classical) and Cham cultures (early and late phases), and perhaps some survival Boleráz. Their distribution, complementing Baden, outline the full archaeological tableau of the *Jungsteinzeit* period in Austria, partly overlapping (with Baden–Cham, Baden–Jevišovice, Baden–Boleráz), partly complementing (Baden–Mondsee II/III) each other. There are sites such as Lengfeld, in whose case the cultural attribution of the find material is uncertain, i.e. whether it should be assigned to Baden or to Jevišovice coloured by Baden imports<sup>124</sup>. The same dilemma is encountered in the case of the double burial from Palt<sup>125</sup> and in the case of some sites regarding Baden and Cham<sup>126</sup>.

<sup>122</sup> Mayer 1999, 169, 174; Mayer 2008; Krumpel *et al.* 2008.

<sup>123</sup> Ruttkay 1999, 157; Ruttkay 1999, 609–611.

<sup>124</sup> Schmitsberger 2004, 194, Schmitsberger 2009, 366.

<sup>125</sup> Ruttkay 1975; Schmitsberger 2006a.

<sup>126</sup> E.g. Matzleinsdorf near Melk, Schwammenhöfer 2005, 462–463, and in the Enns Valley: Binsteiner, Ruprechtberger

Fig. 13. Classic Baden sites in Austria.

Nr.	Site name	Literature	Site type
57.	Baden-Bojerhöhle	Klemm 1985, 88; Mayer 1985	Cave site.
58.	Baden-Felsensitzhöhle	Klemm, 1985, 89.	Cave site.
59=18.	Baden-Königshöhle	Ladenbauer-Orel 1954; Klemm, 1985, 90; Mayer 1985	Cave site, from Boleráz til Kostolác.
60.	Baden/Gainfarm-Merkensteinerhöhle	Klemm, 1985, 90.	Cave site.
61.	Baden-Winschloch	Klemm, 1985, 92.	Cave site.
62.	Alland-Buchberg	FÖ 6, 9.	Hilltop settlement.
63.	Ebelsberg-Wachtberg	Pertlwieser, Tovornik 1970, 15, Taf. IV.2	Hilltop settlement.
64.	Langenstein-Berglitzl	Pertlwieser, Tovornik 1970, 15, Taf. IV.1	Hilltop settlement.
65.	Ossarn-Grasberg	Hahnel 1992; Bayer 1928; Mayer 1996	Hilltop settlement, from Ila til Kostolác. Grube Wegscheider 16: settlement with 2 children skeletons.
66.	Ossarn-Flur Langwiesfeld	Krumpel 2005	Hilltop settlement.
67.	Steyregg-Pulgarn	Rammer 2010	Hilltop multicultural settlement, Cham-Ossarn II-Baden.
68.	Ahrenberg	Krumpel 2005	Separated cemetery.
69.	Antau/Selegszántó	FÖ 51, 163.	
70.	Au am Leithegebirge	Hahnel 1992	In 3 pits with cremated human urne remains. Separated cemetery or open settlement with cremated burials?
71.	Bad Fischau	FÖ 2, 13.	Open sttlement with cattle skeleton?
72.	Baumgarten an der March	FÖ 44, 453.	
73.	Brunn am Gebirge-Wolfholz	after P. Stadler	Baden Ila-b settlement.
74=20.	Bullendorf	FÖ 45, 633.	Boleráz-Baden settlement.
75.	Deutschkreutz-Girm/Küllő	FÖ 6, 5.	
76.	Dreistetten	FÖ 41, 549.	
77.	Drösing-Mayrheide	Schmitsberger <i>et al.</i> 2004	
78.	Eckartsau	FÖ 40, 559.	
79.	Eisenstadt-Leithabergstraße	FÖ 4, 2.	
80.	Franzhausen I, II, III=Nußdorf ob der Traisen?	Ruttikay, Techler-Nicola 1984; Hahnel 1992; FÖ 28, 56-57; Mayer 1991	3 double graves and a skeleton-part.
81.	Frauenhofen	FÖ 9, 250.	
82.	Gars am Kamp	FÖ 7, 10.	
83.	Gobelsburg	FÖ 49, 16.	
84.	Gösing	Schmitsberger <i>et al.</i> 2004	
85=21=14.	Grub and der March-Unterhaspel	Hahnel 1992	Grave 2: cremated urngrave, Ia phase at the site. Baalberg? Grave 1: Classic Baden.
86.	Grossenzersdorf-Oberfeld	Schmitsberger <i>et al.</i> 2004	
87.	Guntramsdorf-Kirchengaße 11	FÖ 9, 250.	
88.	Hadersdorf am Kamp-Bahnhof	Schmitsberger <i>et al.</i> 2004	
89.	Hain	FÖ 51, 193.	
90.	Hankenfeld	Hahnel 1992, 85,	3 young individuums with animal bones.

2016, 72, 74-92; Steyregg-Pulgarn: Rammer 2010, 10; Ossarn II imports or original potsherds in a Cham hillfort settlement.



Nr.	Site name	Literature	Site type
91.	Hatzenbach-Schottergrube Penner	FÖ 43, 192.	Ossarn II or later?
92.	Herzogenburg	Hahnel 1992; Ruttkay, Teschler-Nicola 1984	Skeleton grave.
93.	Hohenau am der March-Föhrenhügel	Schmitsberger <i>et al.</i> 2004	
94.	Illmitz/Illmic	FÖ 4, 2.	
95.	Inzersdorf ob der Traisen	Ruttkay, Teschler-Nicola 1984	2 graves.
96.	Kapfenstein-Kölldorf	FÖ 9, 208.	
97.	Katzelsdorf am Wienerwald	FÖ 4, 6.	
98.	Kirchberg am Wagram	Schmitsberger <i>et al.</i> 2004	
99.	Kittsee/Köpcsény-Steinfeld Acker	FÖ 34, 604.	
100.	Kleinwilfersdorf	Schmitsberger <i>et al.</i> 2004	Begin with IIa. phase.
101.	Kleinwolkersdorf-Waschberg Hang	FÖ 40, 18.	
102.	Kollnbrunn	FÖ 43, 24.	
103.	Kroatisch Minihof/Malomháza	FÖ 33, 462.	
104.	Lengenfeld	FÖ 48, 366.	Cham or Baden?
105.	Leobendorf-Neufeld	Schmitsberger <i>et al.</i> 2004	
106.	Leobersdorf-Schießstatt	Ruttkay, Teschler-Nicola 1984; Hahnel 1992; Mayer 1991	2 burials: 1 biritual grave and another skeleton + skull.
107.	Lichtenwörth-Oberes Kreuzfeld, Äußerer Huthügel	Ruttkay, Teschler-Nicola 1984; Mayer 1991	Multiple grave.
108.	Maissau	FÖ 48, 346.	Grave dated with <sup>14</sup> C.
109.	Mannersdorf am Leithagebirge	FÖ 42, 19.	Running til Kostolác.
110.	Mattersburg-Wiesen-Sigless	FÖ 12, 9–10	Begin with IIa phase.
111.	Matzleinsdorf	FÖ 44, 462–467.	Cham-Baden multicultural site.
112.	Mitterstockstall-Hausberg	Schmitsberger <i>et al.</i> 2004	
113.	Mollmannsdorf	FÖ 10, 18	
114.	Mörbisch am See/Fertőmeggyes	FÖ 7, 6.	
115.	Muggendorf	FÖ 9, 36,	
116.	Mühlfeld	FÖ 4, 7.	
117.	Neidling	Krumpel 2005	
118.	Neubach	FÖ 3, 118.	
119.	Neudörf/Lajtaszentmiklós	FÖ 33, 462.	
120.	Neusiedl am See-Fundstelle 2	Foltiny, Ohrenberger 1952	Human remains in a pit, is it a coherent settlement part with Fst. I?
121.	Niederfellabrunn	Schmitsberger <i>et al.</i> 2004	
122.	Niederhollabrunn	Schmitsberger <i>et al.</i> 2004	
123=25.	Nikitsch/Füles	FÖ 34, 604.	Boleráz-Baden/Ossarn I. settlement.
124.	Nussdorf ob der Traisen=Franzhausen?	Ruttkay, Teschler-Nicola 1984	Skeleton grave, is it the same site as Franzhausen?
125.	Obergänsernsdorf	FÖ 9, 252.	
126.	Obersulz-Wartberg	Schmitsberger <i>et al.</i> 2004	
127.	Oberwagram	Krumpel 2005	Settlement on a high terrace.
128.	Oberwinden	Krumpel 2005	Settlement on a high terrace.
129.	Obritzberg-Rust	Hahnel 1992, 84.	2 graves.
130.	Oggau/Oka	FÖ 3, 118.	
131.	Ollersbach-Wolfersdorf	Ruttkay, Teschler-Nicola 1984; Hahnel 1992	3 individuals: a skeleton and a cremated individual within a biritual grave.

Nr.	Site name	Literature	Site type
132.	Orth an der Donau–Heidboden	Schmitsberger <i>et al.</i> 2004	
133.	Pillichdorf–Hauptstraße	Schmitsberger <i>et al.</i> 2004	
134.	Pottenbrunn	Krumpel 2005	Settlement begin with IIA phase, on a high terrace.
135=28.	Probstdorf–Nord	Schmitsberger <i>et al.</i> 2004	From Boleráz til Baden/Ossarn I.
136.	Ratzersdorf an der Traisen	Krumpel 2012	Burials inside the settlement and a separate cemetery next to it.
137.	Reichersdorf=Franzhausen?	Mayer 1991; FÖ 23, 97.	Graves.
138.	Reidling–Bachgasse 18	Krumpel 2005	2 pits.
139.	Salzburg–Hohen Rainberg?	Hahnel 1992, 84.	Graves. Baden?
140.	Sarasdorf	FÖ 53, 235.	Grave with gravegoods.
141.	Schützen am Gebirge/Sérc	FÖ 20, 275.	
142.	Sitzenberg	Hahnel 1992, FÖ 23	Cremated double graves with gravegoods.
143.	Sitzenthal	FÖ 13, 34.	
144.	St. Andrä an der Traisen	Krumpel 2005	
145.	Stetten	FÖ 49, 319.	
146.	Stoitzendorf	Schmitsberger <i>et al.</i> 2004	Pits and a vessel depot.
147.	St. Pölten–Zubringerstraße	FÖ 31, 413.	
148.	Straß–Neue Siedlung	Schmitsberger <i>et al.</i> 2004	
149.	Tattendorf	FÖ 51, 256.	
150.	Ulrichskirchen–Kreuzberg	Schmitsberger <i>et al.</i> 2004	Running til Kostolác.
151.	Unterloisdorf/Alsólászló	Horváth, Fiebig 2022	
152.	Unterpetersdorf	FÖ 6, 7.	
153.	Unterrohrbach–Im Hötzelsberg	Schmitsberger <i>et al.</i> 2004	
154.	Unterwinden	Ruttkey, Teschler-Nicola 1984	Skeleton grave.
155.	Vösendorf–Eisgrubfeld	Seewald 1966; Ruttkey, Teschler-Nicola 1984; Hahnel 1992	Multiple crouched skeleton grave with gravegoods. Perhaps there were Boleráz finds at the site too (SEEWALD 1966, Abb. 5–6).
156=34.	Wagram and der Donau–Gang-erfeld	Schmitsberger <i>et al.</i> 2004	From Boleráz til Baden/Ossarn I.
157.	Wagram an der Traisen/Trais-mauer	Ruttkey, Teschler-Nicola 1984	Skeleton grave.
158.	Wagram ob der Traisen–Rufer Höhe, Flur Bergarn, Flur Setzen	Krumpel 2005	With graves at the site.
159.	Wangheim	Sauer <i>et al.</i> 2007	With graves at the site.
160.	Wetzleinsdorf–Ziegelei	Schmitsberger <i>et al.</i> 2004	3 pits.
161.	Wien Bez. 21. Eipeldauerstraße	FÖ 2, 50.	
162.	Wien Bez. 22. Seeastadt Aspern, Anna-Müller Staße	Penz 2014	
163.	Wien, Bez. 22. Aspern, Raasdorfer Strasse=Flugfeld= Hausfeldstraße	Schmitsberger <i>et al.</i> 2004; Penz 2014	
164.	Wien, Bez. 23. Gatterederstraße	FÖ 9, 174.	
165.	Windpassing	Schmitsberger <i>et al.</i> 2004	
166.	Wöllersdorf	FÖ 46, 630.	Cremated grave.
167.	Wulkaprodersdorf/Vulkapordá-ny–Friedhof	FÖ 4, 4.	
168.	Ziersdorf–Fundstelle I.	Schmitsberger <i>et al.</i> 2004	Running til Kostolác, with graves at the site?

Nr.	Site name	Literature	Site type
169= 39=13.	Zwerndorf–Dornplatz	Schmitsberger <i>et al.</i> 2004	Running from Boleráz til Kostolác.

### Late Baden with Kostolác-like material, Ossarn II. distribution (Jungneolithikum)

Due to the unassessed sites, our knowledge about the inner cultural affiliation of the settlements is very poor. A few sites have provided data on the second, latest phase of classical Baden, described as coloured by Kostolác-type finds in Baden, but most of the potential sites are probably among the still unprocessed sites<sup>127</sup>. Additionally, some late Baden sites lack Kostolác-like material altogether.

The reported sites are in *Burgenland*, in the Vienna and St. Pölten areas<sup>128</sup>, reflecting the current state and level of research and publications, rather than the place of real interactions and the possible Baden–Kostolác transition. Among the radiocarbon dates, one sample from Hatzenbach gave a date between 2800 and 2600 BC, falling into the *Endneolithikum* (sample VERA–730). This one date can be taken as a possible indication of the survival of Baden after the *Jungneolithikum*, in the *Endneolithikum*, until the appearance of the Corded Ware, Makó–Kosihy–Čaka and Bell Beaker cultures in Austria<sup>129</sup>, coloured by Jevišovice Mödling–Zöbing, late Cham and some Pit Grave effects. Pure Kostolác sites have not yet been reported from Austria. The possible interactions between the Baden and Kostolác populations cannot be modelled without settlement data, based solely on typology<sup>130</sup>.

The same elements of classical Baden are attested in Hungary between 2800 and 2600 BC, called the Transition Period between the Copper and the Bronze Age<sup>131</sup>. There are no traces of any changes in vessel forms or decorations in the general find material. The only evidence for survival comes from radiocarbon dates (e.g. from Balatonőszöd, Nagykanizsa and Budakalász) and from the appearance of some new, Bronze Age vessel types and metalwork.

### General remarks on the distribution

In addition to the great geographical differences, we have to call attention to other radical dissimilarities when comparing the distribution of the Baden complex in Hungary and Austria.

While in the earlier horizon, in the Boleráz period in Hungary, there was no other prehistoric culture that would have blocked its spread, in Austria, Boleráz lived together with Altheim and Mondsee, two *Pfahlbau*-type cultures as its neighbours. Although they had different settlement types, this radically different settlement type (pile dwellings) did not mean a radically different material culture or lifestyle (and some overlaps can be noted too: for instance, a few pile dwellings can be associated with Boleráz, around Bodensee and in the Ljubljana Marshes, confirming this model, there are some classical Baden and Cham *Pfahlbau*-type settlements in southern Germany<sup>132</sup> and open Cham settlements, e.g. at Kicking–Grubhof<sup>133</sup>, while non-*Pfahlbau*-type hilltop sites of the Mondsee culture are also attested, e.g. at Ansfelden–Burgwiese<sup>134</sup>). Nevertheless, Boleráz did not have as extensive a distribution as classical Baden: the number of Boleráz sites is lower than of classical Baden, and its internal development is unique in that it cannot be separated into phases or horizons<sup>135</sup>. It can best be described as the expansion of a new pottery style<sup>136</sup>. Boleráz evolved in Moravia, but the earliest Boleráz sites appeared in Austria, on the boundary between the two, reflecting its rapid expansion.

<sup>127</sup> E.g., Ossarn I–II sites with Kostolác or Kostolác-like pottery: Baden–Königshöhle, Grub an der March, Hatzenbach, Kuglinac bei Drassburg, Maissau, Ossarn, Pöttsching, Reidling–Sitzenberg, Unterloisdorf, Trausdorf an der Wulka, Wien Bez. 21, Seestadt Aspern, Wöllersdorf, Wulkaprodersdorf.

<sup>128</sup> Krumpel 2005; Krumpel 2008.

<sup>129</sup> So called Neusiedler facies, after Ruttkay 2002; Ruttkay 2003, same with Salgótarján facies in NE-Hungary (Horváth 2017d) and real Kostolác at the EW corner of Hungary (Szombathely: Horváth, Wild 2017).

<sup>130</sup> At the Baden site of Mödling–Goldene Stiege 10, we measured a radiocarbon date from Kostolác ceramics between 3000 and 2900 BC, which indeed indicated a younger time band than the average Baden/Ossarn I horizon between 3350 and 3000 BC.

<sup>131</sup> Horváth 2016, 76–80.

<sup>132</sup> Matuschik 2001.

<sup>133</sup> Ruttkay 1987.

<sup>134</sup> Trebsche 2008.

<sup>135</sup> Horváth 2014a, Section 3.3.14.

<sup>136</sup> After Furholt 2008.

A new pottery style, called classical Baden appeared from 3370/3350 BC, in a particular context with Boleráz, as their sequence shows (which could indicate both an organic or a “coerced” development).

The available radiocarbon dates from the entire Baden distribution indicated the same period, without an indication of earlier ones, just as in the case of Boleráz. It would seem that Baden made its appearance simultaneously over its entire extensive territory as a uniform pottery style. The formation centre perhaps lay along the border between south-western Slovakia and south-eastern Austria on the testimony of ceramic typology since most of the published IIA-type sites lie in this region.

In contrast to Austria, regional Baden variability can be discerned in Hungary, described as groups or regional variants<sup>137</sup>. Following a critical review of these groups during the past few decades and as part of the research undertaken with this grant, I found that most of these groups had actually existed<sup>138</sup>, although their regionality was sometimes based on no more than a single typological variation (such as the Viss-type handle in the Viss group, the applied decorations on the neck of the amphorae in the Úny group<sup>139</sup>, and various traits in the Ózd–Piliny group:<sup>140</sup> it is a mountain variant of the Viss-group). The explanation for these variations can be sought in the preceding period. The regional variations in Hungarian Baden can be traced to the cultural mosaic in the terminal Middle Copper Age (surviving Balaton–Lásinja, Bodrogkeresztúr, and Hunyadhalom/Lažňany, *Furchenstich*). This mosaic patterning is in the background of these phenomena, given that the distribution of these preceding cultures more or less coincided with the subsequent territories of the classical Baden groups. Because the terminal Middle Copper Age and its cultures are virtually unknown aside from some stray finds and a scatter of sites, it is very difficult to pinpoint exact cases or patterns to prove this. Nevertheless, despite this scarcity of data, it is clearly visible in some traits of their pottery, particularly the mentioned decorative elements. This is new evidence supporting the old model of local Baden development from the 1960s<sup>141</sup>, which challenged the theory of immigrants from Anatolia. However, it is unclear at this stage of research why these regional phenomena appeared in Baden, “skipping” the Boleráz episode, leaving no traces in Boleráz.

A similar regional variability has not been described for Austrian Baden, which seems more uniform than the Hungarian one, although this can perhaps be explained by its more restricted distribution owing to the country’s geography and the neighbouring cultures with a similar local origin and lifestyles (Mondsee, Cham, Jevišovice) as well as by the lower number of the published material.

In Hungary, Baden only shared the country’s territory with Pit Grave groups, which intruded into the Baden territory in the Great Hungarian Plain as nomadic conquerors; they were genuine immigrants from east with a radically different nomadic lifestyle, while the Baden complex practiced shifting cultivation<sup>142</sup>. In contrast, Austrian Baden lived alongside its local, indigenous neighbours (Mondsee, Cham, Jevišovice), which pursued a similar or identical lifestyle and had a related material culture. This resulted in different distribution pattern in the two countries.

The disappearance of the Baden can be dated between 2800 and 2600 BC in view of some sites in *Burgenland* (Neusiedl facies).

## Settlement patterns, settlement network and hierarchy

### General remarks

There is no well-published Austrian site that would characterise the earlier horizon of the Baden complex, the so-called Boleráz phase. In her studies on the Baden complex, Elisabeth Ruttkay mainly referred to the sites around the town of Mödling south of Vienna, especially Jennyberg near Mödling<sup>143</sup>, but no monograph on this important Boleráz site has been published to date<sup>144</sup>. Only

<sup>137</sup> Úny, Fonyód, Viss, Ózd–Piliny, after János Banner’s monograph published in 1956, 184–187.

<sup>138</sup> Except for Fonyód, Horváth 2014a, Chapter 4.

<sup>139</sup> Horváth *et al.* 2018b, Chapter 6.

<sup>140</sup> Horváth 2018a.

<sup>141</sup> E.g. Neustupný 1968.

<sup>142</sup> Horváth 2006, 91–95; Horváth 2014c.

<sup>143</sup> Ruttkay 1966–1970, 252; Ruttkay 1971a; Ruttkay 1999, 145; Ruttkay 2001.

<sup>144</sup> This is the ultimate goal of my current application.

smaller assemblages from Donnerskirchen–Kreutberg<sup>145</sup>, Neusiedl am See<sup>146</sup> and Schwechat have appeared<sup>147</sup>. However, these assemblages do not provide a sufficiently detailed picture of the typology of the Boleráz phase of the Baden complex. The Jennyberg site might possibly hold such a potential, but due to the stratigraphy of the site, most of the finds must be regarded as being unstratified.

Our current knowledge of the classical Baden settlements relies almost exclusively on two published sites in Lower Austria regarding their chronology and typology. The first is the settlement site of Ossarn–Grasberg, partly excavated by Josef Bayer between 1927 and 1931, who investigated a 16,000 m<sup>2</sup> large area<sup>148</sup>, the second is Lichtenwörth–Oberes Kreuzfeld, excavated in 1978 by Johannes-Wolfgang Neugebauer<sup>149</sup>. The finds from Ossarn were published in 1996<sup>150</sup>, and Lichtenwörth was analysed in 1983<sup>151</sup>. Some of the findings concerning Lichtenwörth were presented in papers and lectures<sup>152</sup>. Christian Mayer is currently working on a monograph that will cover some twelve hundred artefacts from Lichtenwörth<sup>153</sup>.

Although these two sites provide the chronological and chorological framework for classical Baden in Austria, the main problem with both excavations is that they are old excavations and the fieldwork did not meet the currently acceptable standards; there was no interest in occupation patterns or superpositions. Some of the newly excavated sites in the Traisen Valley were investigated over a large area (settlements: Herzogenburg, Neidling, Oberwagram, Oberwinden, Ossarn, Pottenbrunn, St. Andrä an der Traisen, Wagram ob der Traisen; a unique site at Ratzersdorf: a settlement section with intramural burials and an extramural cemetery (?), investigated over a 75,000 m<sup>2</sup> large area; furthermore, Ahrenberg and Sitzenberg, both formal, separate cemeteries without an associated settlement, and Franzhausen I–III, Reichersdorf, Wagram ob der Traisen yielding graves, perhaps also representing cemeteries)<sup>154</sup>; however, most of these remain unpublished<sup>155</sup>. Their assessment, particularly of the settlement material, can offer much new information, leading to radical changes in Baden studies in Austria, similarly to the Balatonőszöd site in Hungary.

There is no excavated and published information about jointly occupied Boleráz–Baden sites or the transition between the two in Austria. The information contained in the excavation reports indicated that a site occupied during both phases was excavated at Zwerndorf, whose assessment would provide much-needed information about the Boleráz–Baden transition<sup>156</sup>. Other possible jointly occupied Boleráz–Baden sites where this transition could be studied are Bullendorf<sup>157</sup> and Unterloisdorf<sup>158</sup>.

Most settlements of the Baden complex are located in lowland or on the gentle slope of former waterbanks, as in Hungary.

In contrast to Hungary, there quite certainly were hilltop settlements both in the Boleráz and in the classical Baden phases in Austria. It remains uncertain, owing to the small investigated areas and/or the old excavation field data or field survey data whether these were fortified or simply open settlements in higher places with natural fortification<sup>159</sup>. The stratified and prominent position of these hilltop settlements as a kind of central places (tribal centre or settlement centre, the core of a settlement agglomeration) similarly remains to be established, given the apparent lack of fortifications and other traces of their prominence. At present, it would appear that they represent the simple, characteristic open settlement type of Boleráz and Baden, established for exploiting the higher-lying

<sup>145</sup> Kaus 1984, 20.

<sup>146</sup> Foltiny, Ohrenberger 1952, 20.

<sup>147</sup> Ruttikay 1971, 21.

<sup>148</sup> Bayer 1928.

<sup>149</sup> Neugebauer 1978, 233–236

<sup>150</sup> Mayer 1996.

<sup>151</sup> Mayer 1983.

<sup>152</sup> Mayer 1990, 101; Mayer 1999, 161.

<sup>153</sup> Mayer 2008, 167.

<sup>154</sup> Blesl 2012; Krumpel 2005, 174–175; Krumpel *et al.* 2008; Krumpel 2012.

<sup>155</sup> Except for two published Ossarn II pits from Reidling: Krumpel 2005, 165–173, and some multiple graves from Ratzersdorf and other sites, e.g. Krumpel *et al.* 2008; Krumpel 2012; Ruttikay, Teschler-Nicola 1984.

<sup>156</sup> Short report about the site in FÖ I/6, 1932, 124; FÖ III/2, 1938, 119; FÖ IV, 1952, 7; FÖ 28, 1989, 172–173; FÖ 29, 1990, 190; FÖ 34, 1995, 34; FÖ 34, 1995, 770; FÖ 53, 2014, 279–282.

<sup>157</sup> Schmitsberger 2006b, 633.

<sup>158</sup> Horváth, Fiebig 2022.

<sup>159</sup> E.g. Senftenberg–Schanzriedl: Hrodegh 1919, 103–105.



areas, particularly forested ones, for animal breeding, resembling the temporary shelter sites in caves (although these were closed sites), but nothing more.

Hilltop-type settlements are common in the neighbouring cultures too, but these were protected with ditches<sup>160</sup>. Their role and status in the settlement hierarchy was probably more prominent than of the Boleráz and Baden ones.

The most intensive archaeological research (excavations and full site reports with the assessment of the material) was conducted in the Linz Basin during the past two decades, which enriched our knowledge with radical new information about the interaction between the Boleráz, Baden, Mondsee, Cham and Jevišovice cultures<sup>161</sup>.

It yet remains to be determined whether the label Baden complex should, in addition to Boleráz and Baden, also include the Cham, the Jevišovice and perhaps the Mondsee cultures in this region, in the same way as the Kostolác and the Vučedol sites were included in Hungary in order to gain a more complex picture of these time periods<sup>162</sup>.

It is clear, even without full site publications, that there was some kind of settlement network in the Enns and, particularly, in the Traisen Valleys in view of the settlement densities and the settlement locations along the rivers on both banks<sup>163</sup>. In the Traisen Valley, some sites formed a conglomerate<sup>164</sup>, although at this level of research, lacking site assessments, it is impossible to determine whether these represented one large mega-site or separate sites of different nature (temporary, permanent, camp-like) strung out like a chain. Similar mega-site conglomerates were identified in the southern Balaton region, e.g. between Balatonszárszó and Balatonőszöd, and between Balatonlelle and Balatonboglár<sup>165</sup>. The dense settlement traces can perhaps be interpreted as reflecting a transhumance-like shifting cultivation by Baden communities, with temporary stations and permanent centres in a transhumance zone<sup>166</sup>.

On this level, we can clearly note the connection and relation between a settlement and its cemetery in the case of large excavations: there was a pattern. The settlement and the cemetery lay near each other in classical Baden, with the cemetery located in the settlement's marginal zone, forming one archaeological site, as at Ratzersdorf<sup>167</sup>. The situation is the same in Hungary at Balatonlelle<sup>168</sup> and Vámosgyörk<sup>169</sup>, with some graves located in the cemetery and some burials on the settlement.

Alsónémedi and Budakalász (Baden) as well as Pilismarót (Boleráz) are exceptions, without settlement traces in their proximity, and thus they represent another pattern. It seems that there were formal, extramural cemeteries with a high number of graves in the Baden complex, and their existence still needs to be contextualised<sup>170</sup>.

One formal separate graveyard is known from Austria too, from Ahrenberg, where eleven graves containing the burials of more individuals were uncovered<sup>171</sup>. This can perhaps be interpreted as reflecting the greater prosperity of a few Baden (trading?) communities.

In the lack of published reports, little can be said of the excavated settlement features of the Baden complex in Austria. The published settlements had pits and pit complexes<sup>172</sup>, while there is no mention of hearths, ovens or cultural layers as on the sites excavated in Hungary<sup>173</sup>. Houses have been mentioned from Hohenau am der March and Pottenbrunn, but these are later, dating from

<sup>160</sup> E.g. in the Jevišovice culture: Krems–Hundssteig, Meidling–Kleiner Anzingerberg, Krenn-Leeb 2004; in the Cham culture: Steyregg–Pulgarn, Rammer 2010; Ansfelden–Burgwiese, Trebsche 2008; in the Mondsee culture: Ansfelden–Burgwiese, Trebsche 2008.

<sup>161</sup> Steyregg–Pulgarn: Rammer 2010; Ansfelden–Burgwiese: Trebsche 2008; Mondsee: Lochner 1997; Binsteiner, Ruprechtberger 2016: lithics.

<sup>162</sup> Horváth 2015a; Horváth 2016.

<sup>163</sup> Blesl 2002, 4.

<sup>164</sup> Franzhausen, Gemeinlebarn–Sitzenberg, Ahrenberg, Ratzersdorf: Krumpel 2012, 224.

<sup>165</sup> Horváth 2014a, Chapter 4, 613–615.

<sup>166</sup> Horváth 2014a, 668–669.

<sup>167</sup> Krumpel 2008.

<sup>168</sup> Sófalvi *et al.* 2007; Nagy 2010.

<sup>169</sup> Farkas 2004.

<sup>170</sup> For one possible explanation, see Horváth 2013, 336; Horváth 2017c.

<sup>171</sup> Neugebauer *et al.* 1997, 453; Krumpel 2012, 224.

<sup>172</sup> Ossarn, in Bayer 1928.

<sup>173</sup> Horváth 2014a, Chapter 3.1.

other cultures and periods. A ground plan of a promising post framed house has been unearthed in Ratzersdorf<sup>174</sup>. The general lack of houses reflects the period's shifting cultivation as well as the field techniques employed on the excavations.

In Hungary, the first and single secure evidence for houses (pile-dwellings) was unearthed at Balatonőszöd. Beside the uniform ground-plans of houses, there were some house models representing the same dwelling type<sup>175</sup>. The existence of this settlement type is indicated by similar finds and features from other sites, either house models, or remains of the houses themselves. The sign on the back of the shoulder of a figurine from Tököl can be “read” as a side view of two pile dwellings and the top view of a boat with oars<sup>176</sup>, which can be interpreted as landmark and artefact symbols at Tököl, a site lying near the two well-known Baden cemeteries at Alsónémedi and Budakalász<sup>177</sup>, and as an indication of the demonstrable presence of pile dwellings in Hungary, particularly in view of the proximity of the buildings uncovered at the Esztergom–Szentkirályi-dűlő site<sup>178</sup>.

Daub fragments, interpreted as originating from houses and thus indicating their presence, have been reported from many sites<sup>179</sup>. However, much greater caution must be exercised in their interpretation because daub fragments similar to ones described in the reports could equally well have come from an open-air oven or ovens. I only describe these as house fragments if they can be clearly identified as originating from a house floor, wall or roof, as at Balatonőszöd<sup>180</sup>.

Archaeologist often discuss how house models can be used in the reconstruction of the one-time houses. In the case of the Baden complex, we know about pile-dwellings from many sources, even though this was not the most frequent settlement type. The preceding period, the terminal Middle Copper Age, was a mixed period without developed cultures, characterised by post-framed buildings, known from the settlements of the Ludanice, *Furchenstich*, late Balaton–Lasinja and Hunyadihalom/Lažňany cultures. An incised depiction of this building type appears on the base of a mug from Olomouc–Řepčín in Moravia<sup>181</sup>.

The connection and relation of Austrian Baden to Kostolác is unknown. Kostolác is generally regarded as part of the Baden complex in Hungary<sup>182</sup>, even though only Kostolác-like material was previously found. More recently, a modern excavation at Szombathely brought to light pure Kostolác features and finds without Baden<sup>183</sup>.

Kostolác was integrated into the Ossarn II horizon in Austria, although it remains unclear whether we are dealing with Kostolác-like or genuine Kostolác finds, as does its relation to Baden. Only so much is certain that the Ossarn II–Lichtenwörth horizon is later than Ossarn I, thus their relation falls into the second half of the studied period.

Insights into the disappearance of Baden and its transition to or relation with the ensuing cultures and periods could be gained from a study of the sites of Franzhausen (Baden+Corded Ware+Bell Beaker), Grossenzersdorf (Baden+Makó), Grünbach am Schneeberg (Baden+Corded Ware), Kollnbrunn (Baden+Makó), Maissau and Mattersburg (Baden+Bell Beaker), Maztleirsdorf (Baden+Cham+Makó), Mörbisch am See and St. Martin an der Raab (Baden+Vučedol) and Wagram ob der Traisen (Baden+Corded Ware+Bell Beaker).

## **Hoard and deposition practices**

### **Vessel depot**

Several vessel hoards of the Baden complex are known from Austria. Similar cases reported from Hungary are dubious because their contexts and find circumstances are unknown<sup>184</sup> as are some

<sup>174</sup> Preinfalk 2000, 200, Abb. 63.

<sup>175</sup> Horváth *et al.* 2007, 52–59, 68–72; Horváth 2014a, Sections 3.1.1, 3.2.5.

<sup>176</sup> Horváth 2014b, 513, Pl. 5.

<sup>177</sup> Horváth 2013; Horváth 2017c.

<sup>178</sup> Horváth *et al.* 2007, 60.

<sup>179</sup> E.g. Bayer 1928, 65–66, 86–87; Ruttkay 2001, 517; Schmitsberger *et al.* 2004, 146–148.

<sup>180</sup> Horváth *et al.* 2007, 72–99; Horváth 2014a, Section 3.1.1.

<sup>181</sup> Šmíd, Kalábková 2015, 77, Fig. 2.5.

<sup>182</sup> Horváth 2016, 87–91.

<sup>183</sup> Horváth, Wild 2017.

<sup>184</sup> E.g. Úny, Viss, etc., mentioned and cited by Kaus 1984, 14–15, for a review of the Úny assemblage, see Bondár 2015.

previously found assemblages from Austria<sup>185</sup>. New evidence and from Balatonószöd suggest a ceremonial use and purposes rather than hoard deposition<sup>186</sup>.

Two genuine vessel hoards remained after the review: a Boleráz hoard from Donnerskirchen<sup>187</sup> and a classical Baden–Ossarn I hoard from Stoitzendorf<sup>188</sup>. Both sites are located at a higher altitude. Pit 20 containing the vessel hoard was excavated on the settlement investigated at Stoitzendorf, while at Donnerskirchen, the hoard was found in a solitary pit without any traces of a settlement. The Donnerskirchen hoard comprised fifteen vessels: a large and a small bowl, one large and two or three smaller amphora-shaped vessels, a handled pot, two jugs and five cups. The Stoitzendorf pit contained six vessels: a large bowl, a handled pot, two jugs and two smaller mugs. Although M. Kaus assigned them to two different deposition types (Donnerskirchen to the first, Stoitzendorf to the second type), the two assemblages are made up of table wares featuring the same vessel types, the only difference being their number; both were used to “lay the table” during a feast.

The existence of similar vessel hoards in Hungary can be neither proven, nor rejected because of their find circumstances. Beside the vessel hoards, a new hoard type was found at Hódmezővásárhely–Gorzsa-V. Homokgödrök: a small mug containing a hoard of chipped stone artefacts made from Bakony radiolarite<sup>189</sup>.

### Other type deposits

The animal and human deposits of Baden complex, representing one variant of depositions, are discussed below.

A unique case can be cited from Tököl, where a hoard of human figurines was excavated<sup>190</sup>. No human figurines are known from Austria.

Two possible instances of metal/copper depositions can be mentioned from the latest period of classical Baden. Grave 1 at Leobersdorf yielded two neck-rings (Ösenhalsring), while the mass grave of Lichtenwörth yielded seven copper neck-rings. A similar deposit with a copper necklace and other finds is known from the hilltop site of Velka Lomnica<sup>191</sup>. The Austrian finds were grave goods, although in their first publication, Kurt Willwonseder suggested that they had been copper raw material for smelting (ring ingots/*Barrenringe*)<sup>192</sup>. A crucible found beside the Ösenhalsring at the eponymous site of Baden–Königshöhle suggested a local workshop and local metal source (*Greywacke zone*)<sup>193</sup>. In Hungary the most common metal types are the awl and dagger/knife from settlements, and some button and pearl as gravegoods<sup>194</sup>. The finds composition is pure copper with arsenic content, casting with arsenic technology.

### Animal deposits

In contrast to Hungary, where many animal burials/deposits have been published from various sites<sup>195</sup>, only a handful are known from Austria: a calf with human cremation burials from Au am Leithagebirge<sup>196</sup>, a calf and human burials from Unterwinden<sup>197</sup>, a cattle deposit from Bad Fischau<sup>198</sup>, a skull with horns from Mödling–Goldenen Stiege<sup>199</sup>, a calf from Unterwinden<sup>200</sup> and sheep from Unter Mixnitz<sup>201</sup>, all from multicultural sites. One reason for the lower number of animal deposits in Austria

<sup>185</sup> E.g. Ossarn, Bayer 1928, 67.

<sup>186</sup> E.g. from Nagyrécsce: Bondár 2008, Figs. 7–9.

<sup>187</sup> Kaus 1984.

<sup>188</sup> Schmitsberger *et al.* 2004, 139–140, Abb. 4, 15.

<sup>189</sup> Horváth, Zandler 2017.

<sup>190</sup> Kalicz 2002.

<sup>191</sup> Novotná 1984, 62, 64–65, Kat. 362, Taf. 61.362; Novotná, Soják 2013, 194–198.

<sup>192</sup> Willwonseder 1937, 21.

<sup>193</sup> Calliani 1894, Fig. 134; Ladenbauer-Orel 1954, Taf. I.1.

<sup>194</sup> Horváth 2016, 68.

<sup>195</sup> Horváth 2010; Horváth 2019; György 2013.

<sup>196</sup> Hahnel 1992, 79–82.

<sup>197</sup> Ruttkay 1984, 81.

<sup>198</sup> Wichmann 1935, 13.

<sup>199</sup> Stadler 1977, 313.

<sup>200</sup> Ruttkay 1984, 81.

<sup>201</sup> Hauer 1937, 156.



could be simply that fewer have been found and/or published rather than the actual lack of deposits, which was perhaps as characteristic a practice as in Hungary. Another explanation could be the differences between religious practices within the Baden complex. Bloody sacrifices (human/animal) were possibly more rare in Austria than in Hungary. The lower number of the bloody sacrifices can perhaps be attributed to the lower number of settlement features in which they were deposited. However, different religious practices seems a more likely explanation because the nature of human burials also differs compared to the ones in Hungary, and there are no human figurines. There is a connection between humans and animals (animal can be substituted for humans in bloody sacrifices, while a figurine for the real body), and thus this coincidence is probably more than mere chance.

### **Burial rites, human deposits**

Christian Mayer (1991) and Johannes Krumpel have reviewed the Boleráz–Baden burials in Austria<sup>202</sup>. In a recent study, Johannes Krumpel only published and reviewed the graves that could be securely assigned to the classical Baden culture from eastern Austria. Therefore, his analysis contains the data of 22 graves with 53 individuals<sup>203</sup>.

For a long time, the first human deposits described as settlement burials were the human skeletal remains from Zillingtal (Boleráz) and Ossarn, Kittsee and Lichtenwörth–Oberes Kreuzfeld (classical Baden). More recently, a complete double burial of the classical Baden period was uncovered in Feature 2928 at Ratzersdorf<sup>204</sup>.

The situation is the same in Hungary. Based on the many examples from Balatonőszöd, I described the skeletal parts as reflecting the settlement rites of ancestor cults, with particular regard to the limbs and skulls that were also lacking from human figurines, suggesting an association between the two. The *post mortem* manipulation of these body parts could be frequently noted on settlements (skull trepanation, brain eating, smoking of the body). The complete single skeletons with a definite orientation and grave goods deposited in grave pits can be regarded as regular settlement burials, while the single or multiple bodies (whether or not accompanied by animal deposits) dumped into pits originally dug as storage pits can be seen as sacrifices<sup>205</sup>.

Regarding burial rites and cultural affiliation, a few regularities can be discerned in Boleráz regarding both inhumations (St. Margarethen, Pöttsching?) and the inurned cremation graves from Au am Leithagebirge/Grub an der March (Urn grave 2 was covered by stones, conforming to the usual practice in Boleráz). Although inhumation graves are very rare in Boleráz, a few new settlement burials are known from Hungary too<sup>206</sup>.

The custom of covering or marking the grave with a stone packing perhaps survived into classical Baden, e.g. at Lichtenwörth–Äußerer Hutbühel and Leobersdorf–Schießstatt<sup>207</sup>. A few stone-packed graves are known from Hungary too: Fonyód (IIa) and the Budakalász and Ózd–Center cemeteries<sup>208</sup>.

Most of the classical Baden/Ossarn I burials are inhumations. It would appear that there was a change in burial rites between the Ossarn I and II phases. Following the chronology proposed by Evžen Neustupný, Christine Neugebauer-Maresch dated the *bustum* at Sitzenberg (Feature 1), which can probably be associated with the nearby graveyard at Ahrenberg, to the later classical Baden<sup>209</sup>. Other cremation burials were documented at Ahrenberg, Wolfersdorf, Reichersdorf (Feature 6) and Grub an der March (Grave 1). This change cannot be confirmed as yet because of the lack of graves dating from the Ossarn II phase, but it would nevertheless appear that fire gains greater prominence in the burial rite in the later classical Baden culture<sup>210</sup>.

Elisabeth Ruttkay noted that Austrian graves are generally oriented to the east, except for the male individual from Grave 1 at Leobersdorf, individual 6 from Feature 3399 at Ratzersdorf; and the

<sup>202</sup> Krumpel *et al.* 2009; Krumpel 2012.

<sup>203</sup> Krumpel 2012, 222–223, Tab. 2.

<sup>204</sup> Krumpel 2012, 213–214.

<sup>205</sup> Horváth 2014a, Sections 3.2.1, 3.2.2.

<sup>206</sup> Horváth 2014a, Section 3.2.2, 157.

<sup>207</sup> Mayer 1991, 37.

<sup>208</sup> Banner 1956, 28–32; Bondár, Raczky 2009; Kalicz 1963; cp. Horváth 2018a, 45–62.

<sup>209</sup> Neugebauer-Maresch, Teschler-Nicola 1984, 132.

<sup>210</sup> Krumpel 2012, 225.

woman from Feature 196 at Wangheim<sup>211</sup>. Christian Mayer argued that this custom is a reflection of certain religious ideas<sup>212</sup>.

According to the enlarged database, there was no correlation between the sex of the deceased and deposition on the left or right side, while there was one regarding age. Children were mostly laid on the left side in a crouched position. Individual 5 of Feature 3399 at Ratzersdorf is the single child laid on the right side in the Austrian record. The individuals buried in the Lichtenwörth–Äußerer Hutbühel grave are the only ones who were not interred in a crouched position<sup>213</sup>. Their deviant position is an exception in the Baden burial rites in eastern Austria<sup>214</sup> and the same seems to hold true for Leobersdorf<sup>215</sup>.

Rectangular wooden chambers, as documented at Ratzersdorf, are common<sup>216</sup>. The rectangular burial pit (Feature 196) at Wangheim indicates a wooden chamber<sup>217</sup>, implying that inhumations in rectangular pits with wooden funerary constructions were not limited to the Traisen Valley, but can be found farther to the east too<sup>218</sup>.

In Hungary, the presence of similar funerary structures could be assumed in some cases, even though no wood remains were preserved<sup>219</sup>.

Inhumation, cremation and biritual burials<sup>220</sup>, *busti*, and secondary burials are attested in classical Baden<sup>221</sup>. Inhumation is the most frequent form of burial, but this picture could be modified following the assessment of the Ahrenberg burial ground, where several *busti* have been unearthed<sup>222</sup>. No *bustum* has yet been found in Hungary.

There are some seemingly empty primary graves or cenotaphs<sup>223</sup>, similarly as has been assumed at Budakalász and Ózd–Center in Hungary<sup>224</sup>.

Looking at the double, triple and multiple burials in eastern Austria, some peculiar funerary practices can be discerned. Most of the deceased were deposited facing each other, except for the two children in Feature 253 at Franzhausen II and perhaps in the *bustum* at Sitzenberg. Since they were interred facing each other, the bodies themselves possibly express polarities, as individuals of the opposite sex or adults and infants were buried together, with the exception of Feature 253 at Franzhausen II and Wolfersdorf. The relation between women/men and adults/children is emphasised through the burial rites. Kinship between buried individuals is an oft-discussed issue, but arguments in support of it are weak. A-DNA analysis have not yielded any results in this respect and epigenetic attributes as identified between the individuals from Grave feature 2928 only provide weak indications of kinship<sup>225</sup>.

Only one formal cemetery without an associated settlement is known from Austria, at Sitzenberg. At Ahrenberg and Ratzersdorf, the graves were located in immediate proximity to each other. This may have been the case also at Wolfersdorf, Lichtenwörth and Leobersdorf, but this yet remains to be proven. The first documented graveyard was uncovered at Ahrenberg, while a small cluster of graves was found at Ratzersdorf. The second new finding is that graves were located in the middle or near the boundary of contemporaneous settlements, as observed at Wangheim in *Burgenland* and at Ratzersdorf<sup>226</sup>.

Both types were observed in Hungary too (formal, separate cemeteries Pilismarót, Budakalász and Alsónémedi, extramural cemeteries in the settlement's marginal zone at Balatonlelle and Vámosgyörk; see above, in the section on settlement patterns and distribution).

<sup>211</sup> Ruttkay, Teschler-Nicola 1984, 81.

<sup>212</sup> Mayer 1991, 43.

<sup>213</sup> Willvonseder 1937, Abb. 2.

<sup>214</sup> Krumpel 2012, 225.

<sup>215</sup> Willvonseder 1937, Abb. 1.

<sup>216</sup> Mayer 1991, 48, Taf. 1.1–2.

<sup>217</sup> Sauer *et al.* 2007, 17.

<sup>218</sup> Krumpel 2012, 224.

<sup>219</sup> Tatabánya, Horváth *et al.* 2018b.

<sup>220</sup> Leobersdorf, Grave 2, Wolfersdorf, Sitzenberg, Grub an der March, urn grave 1: Hahnel 1992.

<sup>221</sup> Nine individuals in four graves, Wagram, Feature 5; Leobersdorf–Schießstatt, Grave 1; Ratzersdorf, Feature 2928, Krumpel 2012, 226.

<sup>222</sup> Krumpel 2012, 225.

<sup>223</sup> Franzhausen II, Features 130 and 1390: Mayer 1991, 32; Krumpel 2012, 226.

<sup>224</sup> Bondár, Raczky 2009, 242–243; Kalicz 1963, 10, Grab 4.

<sup>225</sup> Wiltshke-Schrotta *et al.* in Krumpel *et al.* 2009, 161–164.

<sup>226</sup> Sauer *et al.* 2007, 17; Krumpel 2012.

Most of the graves are found by themselves in open plainland. Only the graves in Wolfersdorf, Leobersdorf and Lichtenwörth were located on gentle hills. Recently excavated features indicate other patterns in the choice of burial locations. At Ahrenberg and Ratzersdorf, the graves were in immediate proximity to each other. This may have been the case at the Wolfersdorf, Lichtenwörth and Leobersdorf sites, but this remains to be proven. The first graveyard was uncovered at Ahrenberg, while a small cluster of graves was found at Ratzersdorf. The second new finding is that graves were located in the middle or near the boundary of a contemporaneous settlement, as observed at Wangheim in *Burgenland* and at Ratzersdorf<sup>227</sup>.

Grave goods are quite rare in the Austrian graves. Pottery played a different role in the burial rite. In inhumation burials, the pottery was not deposited to accompany the interred individual, as far as this can be discerned using archaeological methods. Pottery appears to have been deposited during the backfilling of the grave pit or outside the coffin and seems to have played a significant role during the burial rite<sup>228</sup>. The types, most often a cup and a jug, but always one liquid container (?) and one for drinking, appear to support this interpretation. In one cremation burial at Reichersdorf (Feature 6), the pottery seems to have been deposited as a grave good. Generally, there seems to be no correlation between ceramic forms/types and age/sex of the deceased. Axes and probably hatchets indicate a higher status. Bows and arrows as weapons for hunting and armed conflict (?) may also have been associated with the community's active members (in our terms, with adults in contrast to children)<sup>229</sup>. However, as a child burial (Individual 5 from Feature 3399) at Ratzersdorf shows, grave goods were used as symbols, and we should bear in mind that the deceased was not necessarily the one who had actually wielded the weapons. It is not possible to discern differences between women and men through the examination of grave goods. Axes and hatchets appear to be the single category associated with men. The grave goods accorded to children do not differ noticeably from those given to adults. Additional data is urgently needed to obtain meaningful results regarding this complex issue<sup>230</sup>.

Siltstone and *Dentalium* beads occurred occasionally<sup>231</sup>. Siltstone beads with a diameter of 3 mm are rare; they were more common in the Late Neolithic, as shown by the actual finds. At Ansfelden-Burgwiese in Upper Austria, however, the sediments were sieved and small beads were recovered<sup>232</sup>. Copper neckrings (Ösenhalsring) were deposited at Lichtenwörth and in Grave 1 at Leobersdorf, while bear teeth in Feature 3399 at Ratzersdorf and in Grave 1 at Leobersdorf.

*Dentalium* beads occur in burials lying in close proximity to the geological sources both in Hungary and Austria. At the same time, the use of *Dentalium* (for example as adornments deposited as grave goods) may have had a social meaning too, possibly signalling prestige or status<sup>233</sup>.

All in all, the human deposits in Austria tend to be more burial-like in nature even in cases when they were not “proper” graves, unlike the Hungarian human deposits that were sacrifices. Certain elements (such as orientation, the shape of the grave pit and its wooden structure, various grave good types, etc.) reflect different funerary practices in Austria<sup>234</sup>.

## Magical devices

At present, some 130 human figurines of the Baden culture are known, recovered from 55 sites in Hungary<sup>235</sup>; however, none have been found in Austria. The artefact published as a figurine from Ossarn-Grube Bugl 1 is actually a spoon with a handle, certainly a unique find, but not a figurine!<sup>236</sup>

<sup>227</sup> Sauer *et al.* 2007, 17; Krumpel 2012, 224.

<sup>228</sup> Franzhausen I, Feature 206: Mayer 1991, Fig. 1.2.

<sup>229</sup> Ruttikay, Teschler-Nicola 1984, 80.

<sup>230</sup> Krumpel 2012, 227.

<sup>231</sup> Ratzersdorf, Feature 3399: Krumpel 2012, 220; Wöllersdorf: Thalaá 2016, 28–31.

<sup>232</sup> Trebsche 2008, 65, Abb. 4.11.

<sup>233</sup> Cp. Horváth *et al.* 2018b.

<sup>234</sup> Baden human deposits: Ahrenberg, Au an Leithagebirge/Grub an der March, Franzhausen I–III, Gemeinlebarn-Sitzenberg, Hankenfeld, Herzogenbeurg, Inzersdorf ob der Traisen, Leobersdorf, Lichtenwörth, Neusiedl am See, Nussdorf ob der Traisen, Obritzberg, Ollersbach, Pötttsching, Ratzersdorf, Reichersdorf, Salzburg, St. Margarethen, Sarasdorf, Schleimbach, Sommerein am Leithagebirge, St. Andrä an der Traisen, Unterwinden, Vösendorf, Wagram ob der Traisen, Wangheim, Wolfersdorf, Wöllersdorf, Zillingtal.

<sup>235</sup> Horváth 2014, 515.

<sup>236</sup> Mayer 1995, Taf. 116.5.



However, while this could be a reflection of the state of research rather than of the religious life of Baden, Martin Furholt has pointed out that there are no human figurines from the border of south-western Slovakia<sup>237</sup>. One possible explanation could be that cultural impacts of the figurine- and mask-using ancient Anatolian agrarian cultures did not reach Austria<sup>238</sup>.

Although figurines are known from the preceding *Furchenstich* and the overlapping Jevišovice cultures, these differ from the typical Baden headless types<sup>239</sup>.

The Boleráz animal figurines from Mödling–Jennyberg depicting beavers can perhaps be included among the magical devices<sup>240</sup>, particularly in view of the rich assemblages of beaver bones from other sites such as Baierdorf, reflecting the importance of beaver and its valuable fur. The use of the animal figurines, particularly in Boleráz (Mödling, Zwerndorf), can be an indication of a stronger Funnel Beaker impact.

### Chipped stone

The quarry at Mauer–Antonhöhe (Wien, Bez. 23) and other sources in the broader Vienna area are well known since the 1970s<sup>241</sup>. Antonhöhe radiolarite occurred in the lithic material from Ossarn, Lichtenwörth and Mödling–Jennyberg. Hornstone and quartzite was procured from the pebble bed of the River Traisen. *Plattensilex* was identified at Lichtenwörth and Mödling (perhaps originating from Bayern). Szentgál radiolarite was among the grave goods at Wöllersdorf (unpublished). The grave goods include fine arrowheads. Regrettably, the lithic material from the settlements is mostly unpublished.

### Baden pottery styles

In the lack of fully published settlements, it yet remains to be established whether or not there are regional groups in Austria. The Austrian finds share many similarities with the north-western Transdanubian finds and with the Moravian and south-western Slovakian ones<sup>242</sup>.

It seems to me that three slightly different regions can be distinguished in the classical Baden period in Austria: 1. *Burgenland*, connected to the Hungarian southern Balaton group; 2. Lower Austria, to the line of Vienna, connected to the Hungarian Úny or northern Transdanubian group and Slovakia; and 3. west of the line of Traisen, connected towards the west or northwest, Moravia and the Upper Danube region.

However, these are no more than impressions because I could only work with unpublished finds. In many cases, these impressions are based on one single distinctive trait, as in the cases of the Hungarian groups as identified by János Banner. In Moravia and south-western Slovakia, for example, the use of channel-like grooving and small knobs can be noted on fine wares such as mugs, juglets, jugs and amphoras. The same applied ribs occur on the neck of large amphorae in the Úny group and in the Vienna area. The rectangular shape of cup, mug and jug bellies in the ceramic inventories from the Traisen Valley, e.g. from Ossarn is not encountered in Hungary and Slovakia<sup>243</sup>.

So-called Kostolác-like finds occur alike in Hungarian and Austrian Baden (Ossarn II). The chronological position these finds is currently debated; what seems certain is that they do not mark the latest Baden, given that they can be found during the entire classical Baden period<sup>244</sup>.

### Innovations, long-distance trade in luxury items

There is a special vessel type in Austria probably used for (milk?) fermentation<sup>245</sup>. This vessel type is known from the settlement material of Nagyrécsce in Hungary, but has not been attested at any

<sup>237</sup> Furholt 2008, 618.

<sup>238</sup> Horváth 2009, 117, Fig. 14.

<sup>239</sup> Graziella: Ruttikay, Kramer 2004; and Meidling–Kleinen Anzingerberg: Ruttikay 1991.

<sup>240</sup> Ruttikay 2001, 523–524, Abb. 3.

<sup>241</sup> Ruttikay 1970.

<sup>242</sup> Mayer 1985; Mayer 1996b.

<sup>243</sup> Bayer 1928, Taf. XIV.2, 6, Taf. XX, Taf. XXI.6–7.

<sup>244</sup> Cp. Horváth 2014a: Section 3.3.14.

<sup>245</sup> Ossarn: Bayer 1928, 74, Taf. VII, XV; Steyregg: Cham culture, Rammer 2010.

other site<sup>246</sup>, suggesting that milk fermentation was either not practiced in Hungary or that another method was employed for making dairy products from milk<sup>247</sup>.

Much more is known about copper production in Austria, while Hungary is very poor in metal finds<sup>248</sup>. An arsenic bronze axe is known from Zwerndorf<sup>249</sup> and copper torcs from Baden–Rauheneneck, Leobersdorf–Schießstatt and Lichtenwörth–Äußerer Hutbühel, to which one good parallel can be cited from the hoard discovered at Velka Lomnica<sup>250</sup>. The finds have not been sourced for raw material and neither has their technology been studied. They could be either goods acquired through long-distance trade from Slovakia or the Alpine region (western Austria or *Steiermark*), or possibly made locally from distant raw material following a technology transfer, but they could equally well be local products made from local sources also. The sites located in the *Greywacke* zone in Lower Austria have a rich tradition of historical metal mining.

The Circum-Alpine influence indicates a continuous development in sleighs/slides/pulling devices with wheels and two-wheeled carts<sup>251</sup>, which were specifically developed for mountainous areas and reached Hungary during the Boleráz period. Other Alpine luxury items are attested during Boleráz and Baden, e.g. a speleothem bead at Budakalász–Luppa-csárda<sup>252</sup> and a chamois horn at Zamárdi–Kútvölgyi-dűlő<sup>253</sup>. The Alpine-Dinaric brachycranic type was identified among the human deposits at Balatonószöd<sup>254</sup>.

## Conclusion

No matter how much we would like to, we cannot describe a period characterised by intense population movements and communities with diverse material cultures such as the Late Copper Age and the Baden complex with a single model. Unlike Einstein's concise and elegant general world model condensed into a simple equation, any attempt to do so for the Late Copper Age is beyond our current knowledge. Nevertheless, we have made significant advances in several respects, for example by discarding the Baden IV phase, described as reflecting Kostolác, Bosáca and Coțofeni impacts, which turned out to date from the Bronze Age. By eliminating the Baden IV phase, we have simplified the classical part of the existing typological sequence into an earlier IIb and a later III phase. Together with my earlier conflation of the classical Boleráz Ib and Ic phases, this makes the existing, extremely complicated typological system much more manageable.

We have also managed to identify recurrent patterns in the site chains along former watercourses and the spatial organisation of sites combining a settlement and a cemetery.

Currently, we can distinguish four basic, but fundamentally different settlement and occupation patterns in the Boleráz–Baden domain, as a result of the large-scale excavations over extensive areas.

The first one lacks Boleráz sites as in the Hódmezővásárhely area, the greater part of County Pest and the overwhelming part of the Northern Mountain Range. It seems quite certain that in these regions Baden was not preceded by Boleráz and neither can it be regarded as the antecedent of Baden in any sense because it is not documented here during the Late Copper Age. Thus, we witness a cultural hiatus between 3700 and 3350 BC, excluding any contact between the two cultures.

In some regions, Boleráz and Baden both occur, but always separately, on separate sites, none of which reflect any signs of co-residence between the two. Their chronological position relative to each other shows some overlap between 3350 and 3000 BC. These regions include large tracts of Counties Komárom-Esztergom and Pest. In these cases, there is no archaeologically visible interaction between Boleráz and Baden. Their sites sometime lie quite close to each other, no more than 1 km apart, and thus despite the separateness, contact between them cannot be wholly excluded, but there are no jointly occupied sites.

<sup>246</sup> Bondár 2008, 14, Fig. 12.

<sup>247</sup> Churns, cp. Horváth 2009, 115.

<sup>248</sup> Cp. Horváth 2016, 68–70, note 42.

<sup>249</sup> A stray find, Pesta 1937.

<sup>250</sup> Novotná, Soyák 2013, Abb. 127.6–15.

<sup>251</sup> Cp. Mödling–Jennyberg and Boglárlelle: Horváth 2015b.

<sup>252</sup> Demény *et al.* 2009, 442–446.

<sup>253</sup> Fábrián 2014, 406.

<sup>254</sup> Horváth 2014a, Section 3.3.1.

Yet a third one indicates the same long overlap as in the previous case, but with a radically different occupation pattern, as could be observed at Balatonőszöd, where Boleráz and Baden occupied the same site. A closer interaction can be noted, which is visible to us too, but despite the co-residence, a spatial separation persists. A similar settlement and occupation pattern could be noted in the north-eastern piedmont region too, where no jointly occupied Boleráz–Baden sites were previously known. The settlement layout at Szurdokpüspöki again shows a clear separation between the areas occupied by Boleráz and Baden, although the two radiocarbon dates reflect a closer overlap and a linearity compared to Balatonőszöd. However, I have only assessed a small part of the settlement and we currently only have two radiocarbon dates, and thus any conclusions are tentative at best, while at Balatonőszöd, the available data was considerably larger.

The fourth pattern represents a spatial and chronological variant of Boleráz and Baden co-residence, which could be observed at Balatonkeresztúr and perhaps Balatonlelle, where Boleráz and Baden were mixed, and the Boleráz I and Baden II–III phases followed each other linearly and in rapid succession. This pattern involves the highest degree of interaction between Boleráz and Baden.

In the light of these observations, we can perhaps predict that Boleráz will eventually be divorced from Baden and will be treated as an independent culture, similarly to Kostolác and Vučedol. It will no longer remain the organic initial Baden phase, although Boleráz will be retained in the Baden complex owing to its interaction with Baden and their shared contacts. It will continue to represent the early phase of the complex, similarly to Cernavodă III, viewed as a related culture, but Baden will not be regarded as having evolved from Boleráz. In other words, it seems likely that while Boleráz will “survive” within Baden, it will not be regarded as the par excellence substrate to the emergence of the Baden culture either in terms of its material culture, or in terms of its chronology and the distribution of its sites.

As regards the Austrian Baden complex, one of the most urgent tasks of future research is the full assessment and publication of the excavated sites, beginning with the older ones (such as Mödling–Jennyberg), followed by the larger sites investigated during modern excavations (e.g. Ratzersdorf, Sitzenberg, Wangheim, etc.). Without fresh data, we can but merely repeat what we already know since 1928, the date of Josef Bayer’s first basic publication, even if using different words.

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# Abbreviations

AB	Analele Banatului, I-IV 1928–1931; S.N. I 1981-, The Museum of Banat/The National Museum of Banat, Timișoara.
ACTA	Yearbook of the Székely Museum in Csík and the Székely National Museum, Miercurea Ciuc – Sepsiszentgyörgy.
ActaArchHung	Acta Archaeologica Academiae Scientiarum Hungaricae, Budapest.
AÉ	Archaeologiai Értesítő, Budapest.
Acta Historica	Acta Universitatis Szegediensis (Szeged).
ArchHung	Archaeologia Hungarica.
ArhMed	Arheologia Medievală.
AM	Mitteilungen des Kaiserlich Deutschen Archaeologischen Instituts, Athenische Abteilung (Athenische Mitteilungen), Athen, (1876-).
AMM	Acta Moldaviae Meridionalis (Vaslui).
AMN	Acta Musei Napocensis, The National History Museum of Transylvania, Cluj – Napoca.
AMP	Acta Musei Porolisensis, County History and Art Museum of Zalău.
ArhMold	Arheologia Moldovei, Iași.
BCH	Bulletin de Correspondence Hellénique, Paris, 1 (1877-).
BerRGK	Berichte der Römisch-Germanischen Kommission. Roman-Germanic Commission. Frankfurt am Main.
EphNap	Ephemeris Napocensis, Cluj-Napoca.
CCA	Cronica Cercetărilor Arheologice din România, Ministry of Culture.
CCCA I	M. J. Vermaseren, Corpus cultus Cybelae Attidisque (CCCA), I. Asia Minor, Leiden, New York, København, Köln, 1987.
CIG	Corpus Inscriptionum Graecarum, I-IV, (ed. A. Boeckh), Berlin, 1828–1877.
CIL	Corpus Inscriptionum Latinarum, consilio et auctoritate Academiae litterarum regiae Borussicae editum. (1863-).
Dacia	Dacia. Recherches et découvertes archéologiques en Roumanie, S.V. I-XII; N.S. Revue d'archéologie et d'histoire ancienne, I. 1957 și urm., Vasile Pârvan Institute of Archaeology, Bucharest.
DAGR	Dictionnaire des Antiquités grecques et romaines, I-X, sous la direction de Ch. Daremberg et E. Saglio, Paris, 1877–1929.
DolgSzeged	Dolgozatok a Szegedi Josef Tudományegyetem Archaeologiai Interzetbol (I, 1925...XIX, 1943).
IGB V	Inscriptiones Graecae in Bulgaria repertae, (ed. Georgi Mihailov), vol. V: Supplementum, addenda et corrigenda. Sofia, 1997.
IGDOP	Inscriptions grecques dialectales d'Olbia du Pont, (ed. L. Dubois), Genève, 1996.
IGRR IV	Inscriptiones Graecae ad Res Romanas Pertinentes, IV (ed. G. Lafaye), Paris, 1927.
ISM I, II	Inscriptiones Scythiae Minoris – Inscriptiile din Scythia Minor, I: Histria și împrejurimile (ed. D. M. Pippidi), Bucharest, 1983; II: Tomis și teritoriul său, (ed. Iorgu Stoian), Bucharest, 1987.
LIMC	Lexicon Iconographicum Mythologiae Classicae, I–VIII + index vol., (eds. J. Ch. Balty, E. Berger, J. Boardman, Ph. Bruneau, F. Canciani, L. Kahil, V. Lambrinoudakis, E. Simon), Zürich, München, Düsseldorf, 1981–1999.
LSJ	Liddell H. G., Scott R., Jones H. S., A Greek-English Lexicon, with a revised supplement. Oxford, 1996.
MAA	Monumenta Avarorum Archaeologica.
OM	<i>Orbis Mediaevalis</i> .
PBF	Prähistorische Bronzefunde, München.

RA	Revue Archéologique, Paris (1844-).
RAC	Rivista di archeologia cristiana, Rome (1924-).
RevBistr	Revista Bistriței, Bistrița-Năsăud Museum Complex, Bistrița.
RH	Revue historique, Paris, (1876-).
RIG	Recueil d'inscriptions grecques, par Ch. Michel, Bruxelles, 1900.
Sargetia	Sargetia. Acta Musei Devensis, Deva.
SCIV(A)	Studii și Cercetări de Istorie Veche, tom 1–25, Bucharest, 1950–1974; începând din 1974 (tom 25): Studii și Cercetări de Istorie Veche și Arheologie, Bucharest.
SCN	Studii și Cercetări de Numismatică, Bucharest.
SEG	Supplementum epigraphicum graecum, Lugdunum Batavorum, Leiden, 1923–1971; Alphen aan den Rijn 1979–1980; Amsterdam, 1979–2005; Boston, 2006-.
StCl	Studii Clasice, Bucharest.
Syll <sup>3</sup>	Sylloge inscriptionum Graecarum, (3rd edition), (ed. W. Dittenberger), 1915–1924.
Terra Sebus	Terra Sebus, Sebeș.
ThesCRA	Thesaurus Cultus et Rituum Antiquorum, I–V + index vol., (eds. J. Ch. Balty, J. Boardman, Ph. Bruneau, R. G. A. Buxton, G. Camporeale, F. Canciani, F. Graf, T. Hölscher, V. Lambrinoudakis, E. Simon), Basel, Los Angeles, (2004–2006).
UPA	Universitätsforschungen zur Prähistorischen Archäologie, Institut für Ur-und Frühgeschichte der Universität Kiel.
ZSA	Ziridava. Studia Archaeologica, Arad Museum, Cluj-Napoca.