

Brunn 3 and Schwanfeld. Common features in the ceramics and housebuilding of the earliest Milanovce phase sites in Austria and Germany

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Abstract – The Brunn 3 site in Austria and Schwanfeld in Germany belonged to the Early Linear Pottery culture. Their complexes with archaic ceramic types place them among the earliest sites, which followed exactly after the Formative phase. Both sites had rare common shapes of pottery and decorations as well as buildings with similar trapezoidal floor plans. House 16 of the settlement of Schwanfeld and house 38, site 3 of the settlement of Brunn am Gebirge can rightly be addressed as architectural twins due to their architectural similarities. The phenomenon of identical houses over long distances is presented for the first time in this study. A special feature of house 16 of Schwanfeld is certainly the so-called founder's grave, which was a male individual, who is addressed by the excavators as a hunter or warrior due to his equipment (LÜNING, 2011, 5). This is a special burial within a large pit with a very early date of 5484 calBC (LÜNING, 2011, 5). Interestingly, there are also certain parallels to houses of the Formative phase of Brunn am Gebirge, which are located in the area of site 2b. One of these houses, house 11 of Brunn, dates to 5525-5453 calBC (STADLER & MINNICH, 2021, Table 9.2) and shows clear parallels to the house neighbouring of house 16 of Schwanfeld, which is house 15. Besides comparable radiocarbon dates, which of course have to be treated with a certain caution, similarities in pottery decoration and shapes, and architectural design also play an important role, which makes a coincidence very unlikely. That is why we connect the origin of the Schwanfeld site with the migration of the Linear Pottery culture people from the Vienna Basin.

Key words – archaeology; Early Neolithic; Linear Pottery culture; ceramics; architecture; Brunn 3; Austria; Schwanfeld; Germany

Titel – Brunn 3 und Schwanfeld. Gemeinsamkeiten in der Keramik und Übereinstimmungen im Hausbau der frühesten Fundstellen der Milanovce-Phase in Österreich und Deutschland.

Zusammenfassung – Die Fundstellen von Brunn 3 in Österreich und Schwanfeld in Deutschland lassen sich in die frühe Phase der linearbandkeramischen Kultur (LBK) einordnen. Komplexe mit archaischen Keramiktypen definieren ihre Stellung unter den frühesten Fundplätzen, die chronologisch gesehen auf die Formative Phase dieser Kultur folgten. Beide Fundorte weisen seltene gemeinsame Formen von Keramik und Verzierungen auf, sowie Gebäude mit ähnlichen trapezförmigen Grundrissen. Haus 16 der Schwanfelder Siedlung und Haus 38, Fundstelle 3 der Siedlung von Brunn am Gebirge können aufgrund ihrer Übereinstimmungen zu Recht als architektonische Zwillinge bezeichnet werden. Zum ersten Mal stellen wir das Phänomen baugleicher Häuser vor, die geographisch gesehen weit voneinander entfernt liegen. Eine Besonderheit von Haus 16 von Schwanfeld ist sicherlich das sogenannte Gründergrab, bei dem es sich um ein männliches Individuum handelt und von den Ausgräbern aufgrund der Beigaben als Jäger oder Krieger angesprochen wird (LÜNING, 2011, 5). Es handelt sich hierbei um eine Sonderbestattung innerhalb einer großen Grube mit einer sehr frühen Datierung von 5484 v. Chr. (LÜNING, 2011, 5). Interessanterweise gibt es auch gewisse Parallelen zu den ältesten Häusern der Formativen Phase von Brunn am Gebirge, die sich im Bereich der Fundstelle 2b befinden. Eines dieser Häuser, Haus 11, weist eine Datierung von 5525-5453 v. Chr. auf (STADLER & MINNICH, 2021, Tab. 9.2) und zeigt deutliche Parallelen zum Nachbarhaus von Haus 16 aus Schwanfeld, bei dem es sich um Haus 15 handelt. Neben vergleichbaren Radiokarbonaten, die natürlich mit einer gewissen Vorsicht zu behandeln sind, Ähnlichkeiten in der Keramikdekoration und ihren Formen, spielen auch architektonische Übereinstimmungen eine wichtige Rolle, die gegen eine Zufälligkeit sprechen. Daher bringen wir die Entstehung des Schwanfelder Fundplatzes mit der Migration von Menschen aus dem Wiener Becken in Verbindung.

Schlüsselwörter – Archäologie; Frühneolithikum; Linearbandkeramik; Linienbandkeramik; Keramik; Architektur; Brunn 3; Österreich; Schwanfeld; Deutschland

Introduction

In a large part of Europe, the beginning of the Neolithic is connected to the Linear Pottery culture. In the last 20 years, our knowledge about the earliest sites of this culture has been extended with studies of its Formative phase (BÁNYFY, 2004; STADLER & KOTOVA, 2019a). The publication of the numerous finds of the Brunn 3 site in Lower Austria offers a new impulse for understanding the next phase of the Early Linear Pottery culture – first of all as a comparison of Brunn 3 with other sites of the Early Linear Pottery culture in Austria, Slovakia, Hungary, Germany,

Poland, and the Czech Republic. Our study of the Brunn 3 pottery and architecture has shown unexpected similarities with one of the distant sites: the Schwanfeld site in the Main Basin (Fig. 1). However, despite the long distance between them, these sites have common features, placing them into the framework of other synchronous sites.

Material and methods

The Brunn 3 site is part of a group of Early Neolithic sites excavated by P. Stadler in the outskirts

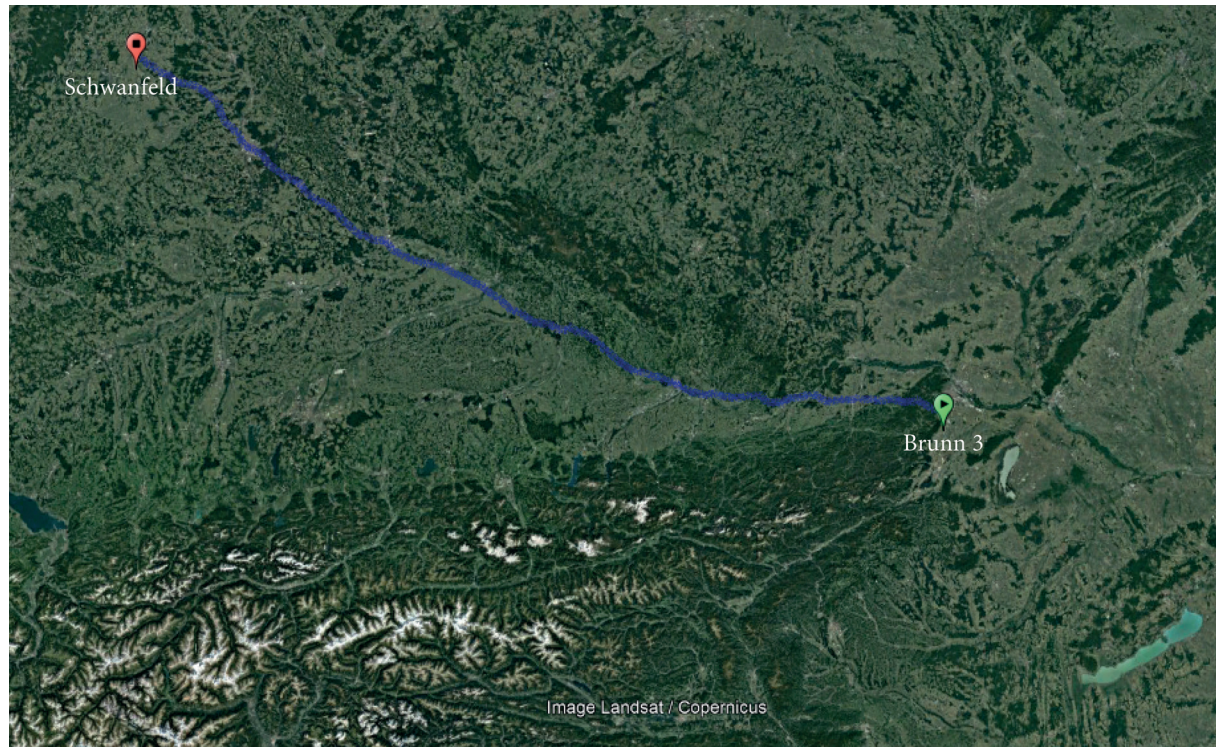


Fig. 1 Map of location of the Brunn 3 and Schwanfeld sites: 1 – Brunn 3; 2 – Schwanfeld. The polyline connecting both sites was created by Google Earth Pro route planner using the option “on foot”.

of the small town Brunn am Gebirge near Vienna. This group represents the development of the Early Linear Pottery traditions from the Formative phase (Brunn 2) to the appearance of the first music note decorations (Brunn 1, 6) (STADLER & KOTOVA, 2019a). The Brunn 3 and 4 sites demonstrate the complexes of the beginning (Brunn 3) and the end (Brunn 4) of the Milanovce phase (STADLER & KOTOVA, 2021). Huge numbers of vessels with numerous reconstructed shapes and a total number of 72 excavated houses with different states of preservation (MINNICH, 2022) allow us to consider each Brunn site as a standard for different phases of the Early Linear Pottery culture. Brunn 3 stands the centre of our analysis in this article. About 18 houses with 870 vessels were studied here (STADLER & KOTOVA, 2021; MINNICH, 2022, 271-474).

Schwanfeld was excavated in between the years 1979 and 1985 in several excavation campaigns (LÜNING, 2011, 1). In our analysis, we used 153 ceramic items from Schwanfeld, which were published by Cladders (2001). The remains of 18 houses were excavated at this site, which were constructed within a timeframe of 125 years (LÜNING, 2011, 5). For our study, the published houses 11, 15 and 16 of the settlement of Schwan-

feld were selected for a comparison with house 38, site 3 and house 11, site 2 of Brunn am Gebirge.

Ceramics study²

For typological analyses of the ceramics, we used the Montelius image database.³ With the program WinSerion we also made a seriation and a correspondence analysis.⁴ We studied the main part of the published Early Linear Pottery culture settlements: Neckenmarkt, Strögen (LENNEIS & LÜNING, 2002) and Winden am See (PRIOR, 2005) in Austria; Szentgyörgyvölgy Pityerdomb (BÁNFY, 2004), Barcs, Baja, Budapest Aranyhegyi út, Fajsz, Bicske, Becsehely, Mernye, Sármellék, Révfülöp, Tolna Medina, Zalavár (KALICZ, 1995; MAKKAY, 1978) in Hungary; Frankfurt am Main Niedereschbach (BERNHARDT, 1998), Bruchenbrücken, Enkingen, Gambach, Goddelau, Klein Denkte, Mintraching, Schwanfeld, Steinfurth, Wang (CLADDERS, 2001), Eitzum (CLADDERS, 2001; PAVÚK, 2004), Flornborn (RICHTER, 1968) in Germany; Bylany F (PAVLŮ ET AL., 1987), Ivanovice u Brna, Žádovice (ČIŽMÁŘ, 1998), Chlum, Jaroměř, Jeřice, Nový Bydžov, Smiřice, Třebovětice, Rožďalovice, Rodov (PAVLŮ & VOKOLEK, 1992), Vedrovice Siroká u Iesa (PODBORSKÝ, 2002) in the Czech Republic; Břina, Hurbanovo, Milanovce, Nitra (PAVÚK, 1980),

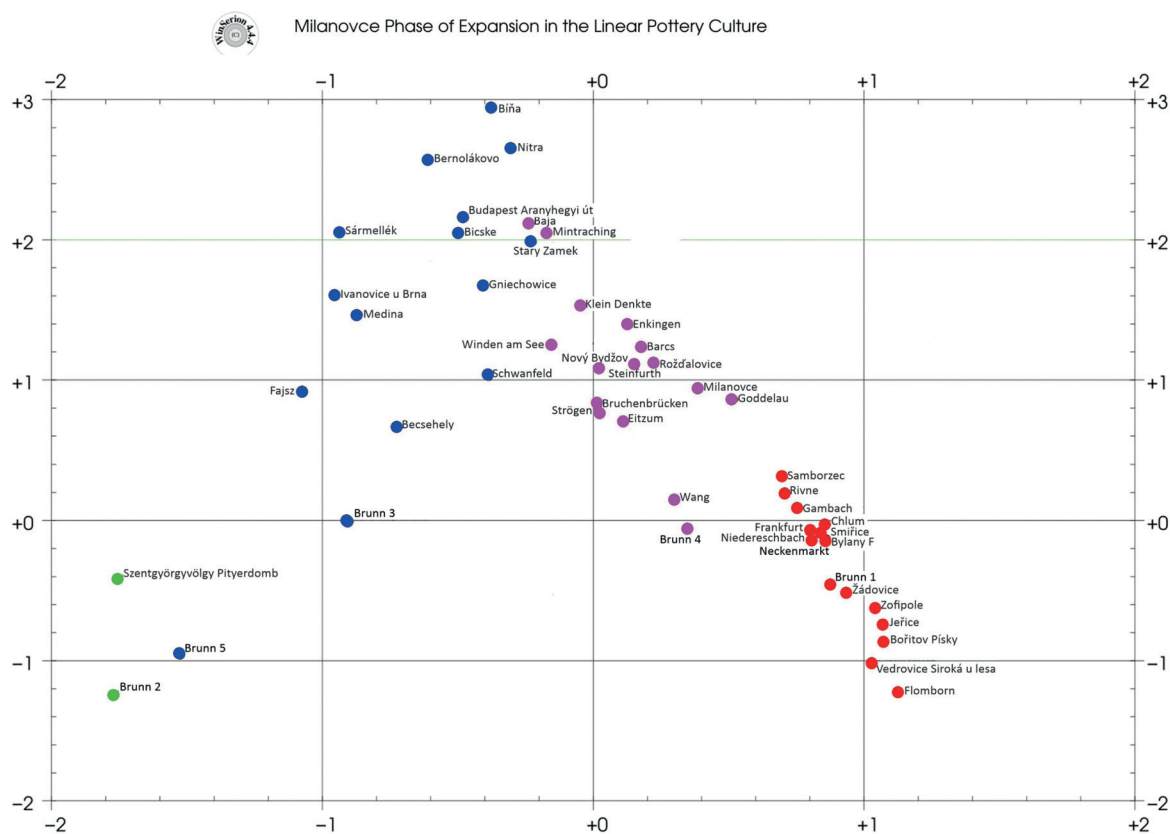


Fig. 2 The parabola of the correspondence analysis of the Early Linear Pottery culture: green spots – sites of the Formative phase; blue spots – sites of the early subphase of the Milanovce phase; pink spots – sites of the late subphase of the Milanovce phase; red spots – sites of the Flomborn-Zofipole phase.

Cífer Pác, Bernolákovo (PAVÚK & FARKAŠ, 2013) in Slovakia; Gniechowice, Stary Zamek (KULCZYCKA, 1961; Kulczycka-Leciejewiczowa & Romanow, 1985; Pavúk, 2004), Samborzec (KULCZYCKA-LECIEJEWICZOWA, 1988; 2010) and Zofipole in Poland (KULCZYCKA-LECIEJEWICZOWA, 1983); Rivne Plaž (ОХРИМЕНКО, 1994; ОХРИМЕНКО, 2001; ПЯСЕЦЬКИЙ & ОХРИМЕНКО, 1990) in Ukraine. We eliminated some small collections with only two to four ceramic types available for analysis from our seriation. This is necessary because the small collections disturb the whole seriation: Jeřice #4, Jaroměř #2, Rodov, Rožďalovice, Stračov, Třebovětice from the Czech Republic; Cífer Pác and Hurbanovo from Slovakia; Brunn 6 from Austria; Révfülöp and Mernye from Hungary; Kleinsorheim and Worms Adlerberg from Germany. Some ceramic types which were produced from the Formative phase 2 till the end of the Flomborn-Zofipole phase were also eliminated from the seriation. After this elimination of long existing features, we analysed 38 types of knobs, about 100 variations of decorations and 250 types of ceramic shapes.

The stability of the position of each site in the seriation relates to the number of reconstructed vessels in the collection. The most stable position is typical for the numerous collections from the Brunn 1, 2, 3 and 4 sites, Szentgyörgyvölgy Pityerdomb, Bruchenbrücken, Frankfurt Niedereschbach, Flomborn, Neckenmarkt, Schwanfeld, Vedrovce Siroka u lesa and Bylany. They mark four chronological groups of the Early Linear Pottery sites. Other sites with a smaller number of types in the analysis can change their position in the seriation without leaving their big groups.

We also conducted a correspondence analysis of the Early Linear Pottery sites, which offers the possibility to see not only a unique sequence of the sites after the seriation but shows a synchronism for some of them. The parabola of the correspondence analysis in **Fig. 2** shows a distribution of the Early Linear Pottery sites. It can be divided by a vertical line into the left and right part, where the left part unites the sites of the Formative phase (in the lower part, green points) and the early sites of the Milanovce phase (upper part, blue points).

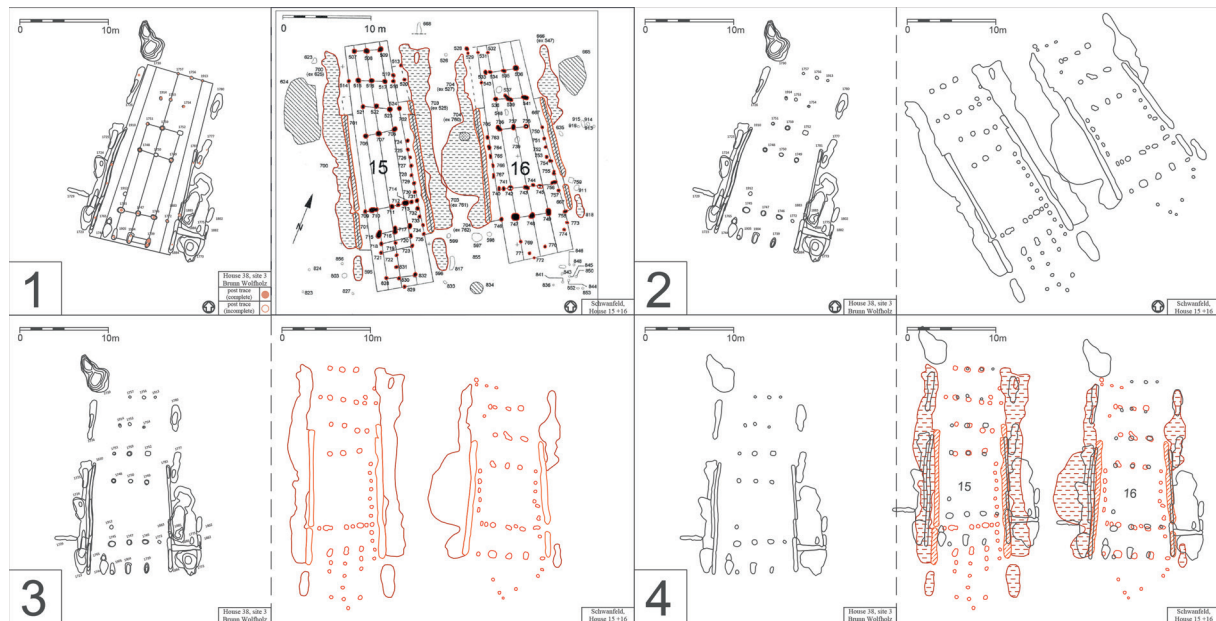


Fig. 3 The four important steps for an analytical house comparison:

1 – House 38, site 3 (left, data from the original survey plan) and the houses 15 and 16, Schwanfeld.

2 – Houses 15 and 16 are drawn in a CAD program, all floor plans are resized to the same scale.

3 – Reorientation of the house plans to an artificial north.

4 – Projection of the house plans from Schwanfeld onto house 38 of Brunn 3. (1-4 left: Total station surveying: Peter Stadler, drawing: Alexander Minnich; 1 right: Lüning 2011, Tafel 1, edited by Alexander Minnich; 2-3 right: redrawing of Tafel 1, Lüning 2011, created by Alexander Minnich; 4 right: redrawing of Tafel 1, Lüning 2011, created by Alexander Minnich with projection onto house 38; Total station surveying: Peter Stadler, Drawing: Alexander Minnich).

The right part of the parabola includes the late sites of the Milanovce phase (near the peak, pink points) and the sites of the Flomborn-Zofipole phase in the lower part (red points). We see gaps between accumulations of sites, which belong to different phases: between the Formative phase sites and Brunn 3 (the early Milanovce subphase), between the Flomborn-Zofipole sites and sites of the later Milanovce subphase. A gap is absent between the sites of the early and late Milanovce subphase, but they are divided by a perpendicular from the peak of parabola to its basis.

*Houses study*⁵

Numerous houses of the Brunn 3 and Schwanfeld sites enable a comparison of their housebuilding. For the investigation of the longhouses of Brunn am Gebirge, a new method for comparing certain architectural elements in order to draw conclusions about the development of the LPC (Linear Pottery culture) architecture from its Formative phase to the Musical Note phase was developed (MINNICH, 2022). A brief description can be found in Fig. 3, 1-4. Differences between the sites are the continuous change in the orientation of Brunn's longhouses

from northwest-southeast to northeast-southwest and the emergence of new shapes of floor plans in the course of the settlement history of Brunn. These analyses then formed the basis for a structured comparison of individual house plans over long distances. With the newly developed method, which cannot be discussed in detail here due to lack of space and which can be found in Minnich's publication (MINNICH, 2022, 833-836), houses with different orientations and states of preservation from the entire distribution area of the LPC can be compared independent from ceramic typology, chronology, and the shape of the floor plan.

Around 5300 calBC, the LPC settlement of Brunn am Gebirge shifts to the northeast from the area of the Brunn 2 site, the houses are oriented differently (N-S to NE-SW) and no more houses are built in the oldest site 2 area. The reasons for this are not fully understood and are the subject of ongoing investigations (MINNICH, 2022, 923; 925). The new site was named site 3 and it is only a small section of a much larger settlement, as many rows of houses at site 3 continue further east, which the extensive geomagnetic surveys in recent years have shown (STADLER, MINNICH & TOTSCHNIG, 2021, 11-36).

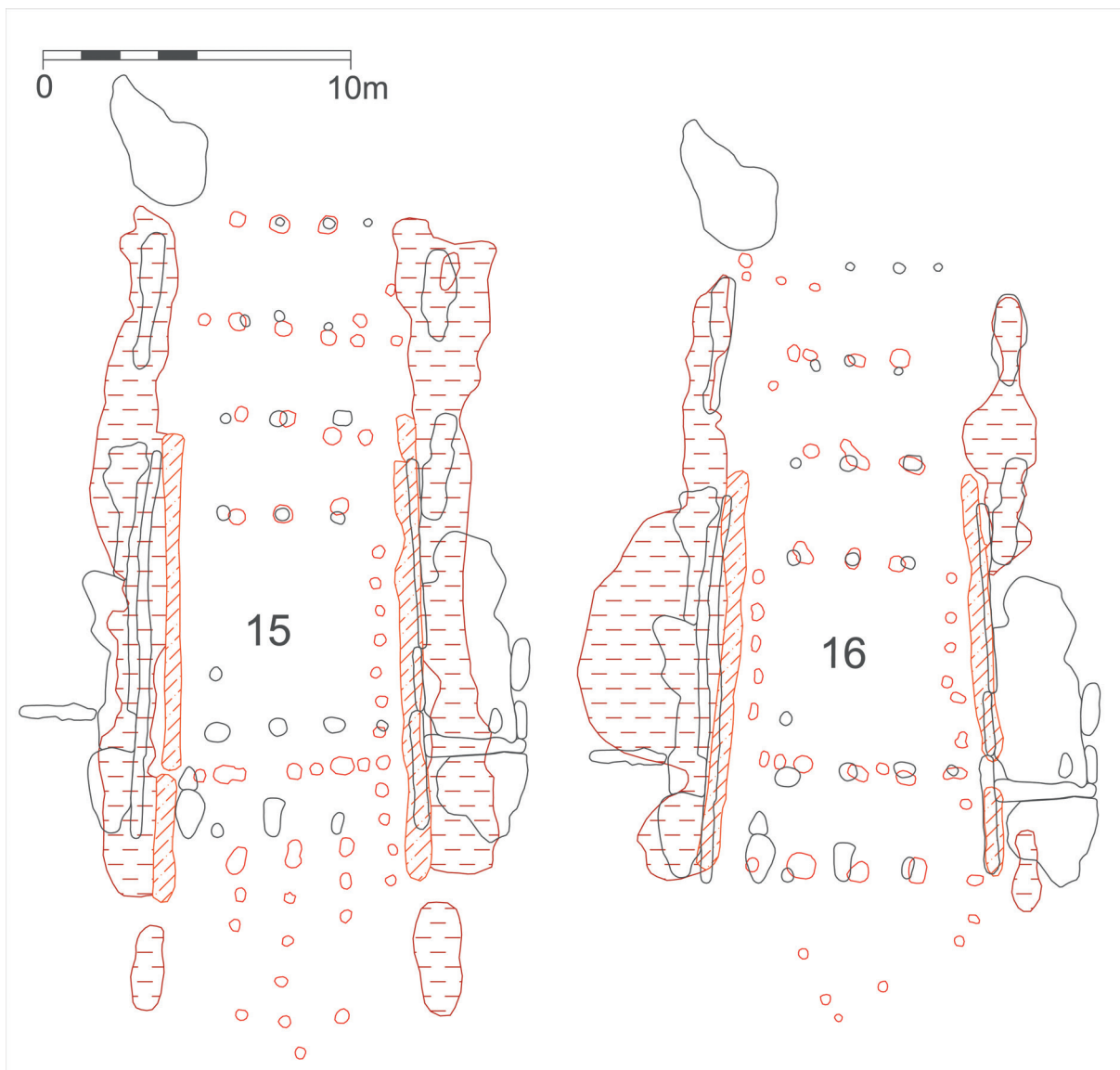


Fig. 4 The projection of the two houses from Schwanfeld (house 15 left, house 16 right) onto the floor plan of house 38 from Brunn 3 (black). (Redrawing of Tafel 1, LÜNING 2011, created by Alexander Minnich with a projection on house 38; Total station surveying: Peter Stadler, drawing: Alexander Minnich).

Further geophysical surveys are already planned for the current year 2022 (Totschnig & Minnich) and it is expected that further traces of settlement activity will be found north of the B12 federal road. So far, 18 houses from site 3 have been excavated (MINNICH, 2022, 271-437). This is therefore currently a rather small section, as further possible eight rows of houses are located to the east and north-east of site 3 with about 33 houses (STADLER, MINNICH & TOTSCHNIG, 2021, 11-36; MINNICH, 2021, slide 10). However, further rows of houses are also to be expected to the south-east of this site on the adjacent properties (STADLER, MINNICH & TOTSCHNIG, 2021, Fig. 1: 5, Fig. 1: 6).

Another special feature is the trapezoidal floor plan, which appears for the first time within site 3 and shows a clear trend towards the west (MINNICH, 2022, 837-839). During the inspection of the individual settlements and their house plans, some of these stood out by showing clear architectural similarities with the trapezoidal floor plans of site 3 of Brunn am Gebirge. One of these settlements showing clear architectural similarities is the LPC settlement of Schwanfeld in Germany, which lies 490 kilometres NW (Fig. 1) from Brunn am Gebirge (MINNICH, 2022, Table 480). A special feature here is house 16, which can be described as almost identical in construction to house 38 of

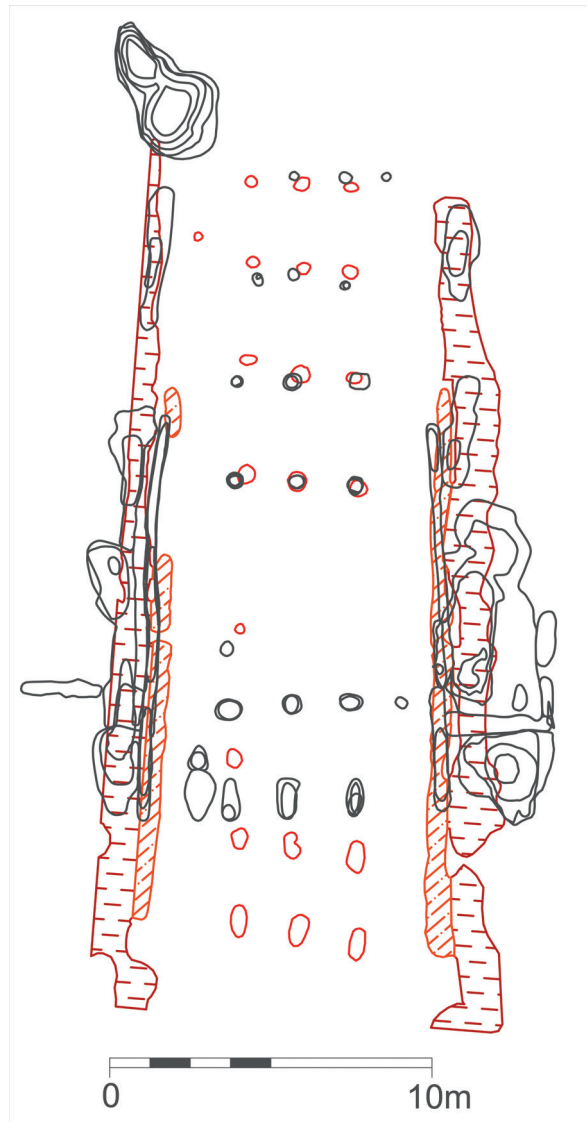


Fig. 5 The projection of house 11 from Schwanfeld (red) onto the floor plan of house 38 from Brunn am Gebirge (black). (Redrawing of Beilage 19, LÜNING 2011; created by Alexander Minnich with a projection on house 38; Total station surveying: Peter Stadler, drawing: Alexander Minnich).

Brunn 3 and will be discussed later in the text.

The house comparison procedure developed by Minnich (2022) was used for this section. In the case of completely preserved floor plans, it makes sense to indicate the length and width index, as important information can be derived from it. However, since relatively few wall posts could be documented for the houses of Brunn am Gebirge due to their state of preservation, we searched for other possibilities. Here, the posts of the inner framework are particularly suitable, as they were sunk deeper into the earth and arranged more regularly than the wall posts. In general,

Linear Pottery culture houses have three parallel longitudinal rows of posts in their interior, which bear the roof load, at least in the older phases of the LPC. The two rows of wall posts, on the other hand, can widen from north to south, as the trapezoidal floor plans show. Due to this peculiarity, it was clear that the wall post rows are rather unsuitable for a systematic comparison of individual floor plans and that the focus must therefore be placed on the three parallel longitudinal rows⁶ in the middle of the buildings. The important point here is the fact that in this way, trapezoidal floor plans can also be compared with floor plans with a rectangular or square shape.

Another important insight that came from the analysis of the post positions within a transverse row was a change in their construction from site 2 towards site 3 in Brunn (MINNICH, 2022, 736). While in the oldest houses, the ridge post within the transverse rows is offset to the south, in the majority of the transverse rows of site 3 the eastern middle post is offset to the north, while the western middle post is offset to the south. At least for the houses of Brunn, the post positions seem to be a good way, besides the orientation, to distinguish floor plans from each other chronologically. However, whether this can be transferred to other settlements needs to be clarified in further studies (MINNICH, 2022/2023 in prep.). In addition, large datasets (if available) on postholes and house pits (e.g., area, volume, stratigraphy) are suitable for drawing conclusions on the weighting of the house side. The analysis of the distances between two neighbouring postholes, both transversely and longitudinally, also provides important information suitable for house comparison.

Individual floor plans from the distribution area of the LPC were compared with the floor plans from Brunn sites 1-6 (MINNICH, 2022, 833-915). One of the most important findings was certainly the fact that modules of the same size (the areas between two neighbouring transverse rows) can be found throughout the distribution area, which indicates a strong tradition of this architectural element and is evidence of a common idea among this culture of how large certain interior spaces had to be designed and at which spot in the house, for example, larger modules had to be placed.⁷ However, for this study the focus was placed on the areas between two neighbouring transverse rows and, on the basis of the three houses 15, 16 and 11 from Schwanfeld, we show which similarities and differences can be worked out between these houses and house 38 of Brunn 3. Therefore, the methodology will be brief-



Fig. 8 The parabola of the correspondence analysis of the Early Linear Pottery culture: purple spots – sites originated from the Austrian variant; yellow spots – originated from the Hungarian variant; blue points – sites originated from the Polish variant; pink spots – sites from Slovakia and similar sites from Germany; brown spots – sites from the Czech Republic; green spots in a red frame – sites of the Flomborn-Zofipole phase.

features catch the eye. In house 15, for example, there is a correspondence above all in the area of the four transverse rows, which are located north of the large module. The large middle section of house 15, on the other hand, is bigger (about 30 m²) than that of house 38 in Brunn 3 (about 26 m²).¹⁰ In this house there is also only one module to the south of the large module, whereas in house 15 from Schwanfeld there are four small modules (Fig. 7). Although the middle sections of house 15 from Schwanfeld and house 38 from Brunn 3 were designed in different sizes and both houses differ from each other in their floor plan shapes (house 38: trapezoidal; house 15: rectangular), there are certain similarities between the two houses.

The closest match, however, is house 16 of Schwanfeld, which can be described as almost identical in construction to house 38 of Brunn 3 (Fig. 4, right). Interesting is, both houses have trapezoidal floor plans with the same number of transverse rows and modules. There are also similarities in the exact position of individual pits and

outer ditches,¹¹ which surprisingly begin or end at the same level in both houses. There is an especially large resemblance at the northern ends of the pits accompanying both houses, which shows that at house 38 parts of these pits had already been eroded. The southern wall post of the eastern wall of house 38 is in exactly the same position as the wall post of house 16. The modules of house 38 are wider than those of house 16, resulting in differences of one to two square metres for each module. Thus, the total area of all modules of house 38 is 69 m², while it is around 60 m² for house 16.¹²

But also house 11 of Schwanfeld shows similarities with house 38 of Brunn am Gebirge. Both houses have the same number of modules (5 in total), but they differ in their respective sizes (Fig. 7). The projection shows (Fig. 6), however, that the last three modules of both houses were constructed similarly. These areas result in about 30 m² for house 11 of Schwanfeld, while they amount to about 31 m² for house 38 of Brunn 3. The first two modules of house 11 have an area

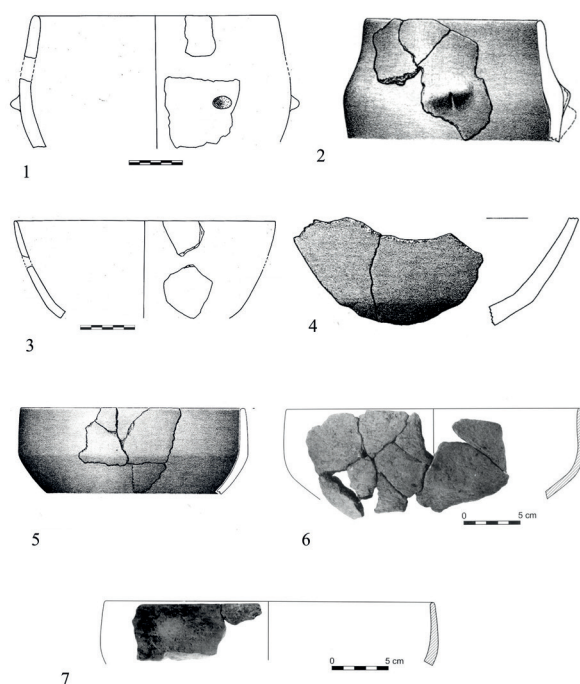


Fig. 9 Ceramics of the Early Linear Pottery culture: 1, 3 – Brunn 2; 2, 4, 5 – Schwanfeld (according to CLADDERS, 2001); 6, 7 – Szentgyörgyvölgy Pityerdomb (according to BÁNFFY, 2004).

of around 51 m² and can be compared with the area of the first three modules of house 38, which together have an area of around 50 m². This convincingly shows that by omitting or adding a transverse row, it was possible to construct interior spaces of any size relatively quickly and easily, and thus to adapt them quite easily to regional needs. Modules 3 to 6 of house 11 with an area of around 30 m² are again the same size as modules 3 to 6 of house 38, or module 5 of house 15 from Schwanfeld (30 m²).

There are also similarities with house 11 from the Brunn 2 site (MINNICH, 2022, Tab. 480) and house 15 from Schwanfeld, which will only be briefly discussed here (Fig. 6). A good example is house 11 of Brunn 2, which is also the longest house of the Formative phase of the LPC. It has a rectangular floor plan, which could not be documented completely. The two middle sections were designed to be similar in size.¹³ In house 11 from Brunn 2, however, an additional transverse row was added in the area of the middle section. Although the transverse rows of both houses were constructed at different inclinations to the longitudinal axis of the houses, one can see similarities in their exact position. This shows that the actual basis of Linear Pottery culture architecture

is the three parallel longitudinal rows and the associated transverse rows, which can be used to form modules of different sizes (MINNICH, 2022, 916). This phenomenon is already found in the earliest houses of the Formative phase at Brunn 2. Therefore, there are only changes in the number of modules and their size. A detailed discussion of this matter can be found in Minnich (2022), where the exact methodology is explained in detail and houses from other settlements from the distribution area are compared with the houses from Brunn am Gebirge.

Independently from the Austrian team, Jens Lüning from his Schwanfeld perspective supports these observations.¹⁴ Since the site of Brunn became known to him, he saw the strong similarities in the floor plan and explained this by their “simultaneity”, as is common. But he won’t disagree to an explanation of direct personal contacts between the residents, which is well possible in expansion

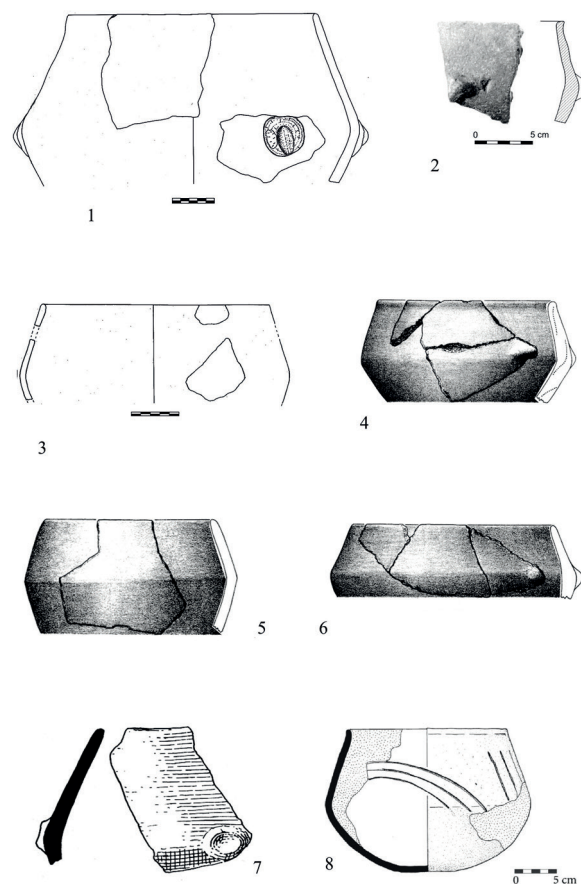


Fig. 10 Ceramics of the Early Linear Pottery culture: 1 – Brunn 2; 2 – Szentgyörgyvölgy Pityerdomb (according to BÁNFFY, 2004); 3 – Brunn 3; 4 – 6 Schwanfeld (according to CLADDERS, 2001); 7 – Bíňa (according to PAVÚK, 1980); Bernolákovo (according to PAVÚK & FARKAŠ, 2013).

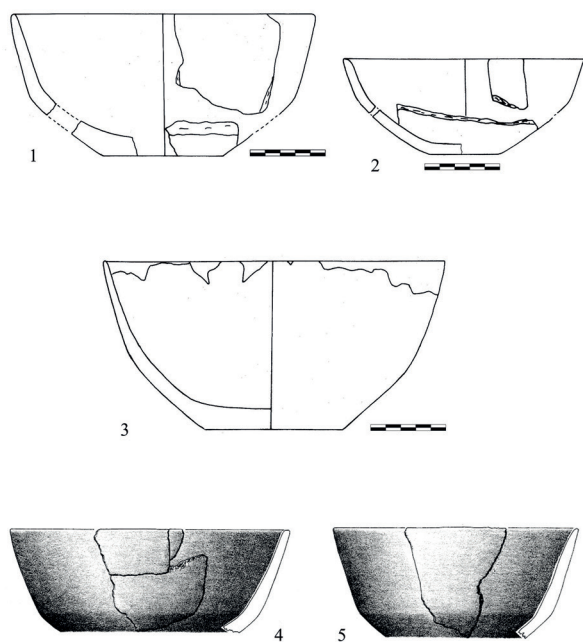


Fig. 11 Ceramics of the Early Linear Pottery culture: 1 – Brunn 2; 2, 3 – Brunn 3; 4, 5 – Schwanfeld (according to CLADDERS, 2001).

phases (like emigration from European [partial] families to the USA). It could be the case that the same hidden “architect” / “wandering architect” is behind the resemblance between Schwanfeld house 16 and Brunn house 38 (“architectural twin”). One can also occasionally find striking similarities in floor plans later in the LBK: transportable plans must have existed (not only in memory).

Results in ceramics analysis¹⁵

Our correspondence analysis of the Early Linear Pottery sites has given a complex parabola, which consists of some lines or arches (Fig. 8). They derive from sites in various areas: Austria, the Czech Republic, Germany, Hungary, Poland, and Slovakia. Sometimes, sites from two countries are combined in one arch. The lowest arch of the parabola in different shades of purple includes Brunn 2 (the Formative phase), Brunn 5, 3, Becsehely, Schwanfeld (the early subphase of the Milanovce phase), Bruchenbrücken, Strögen, Eitzum, Wang, and Brunn 4 (the late subphase of the Milanovce phase). These sites have the most numerous similar ceramic types and, first of all, major similarities between the Brunn 3 and Schwanfeld materials.

Our seriation shows an absence of all ceramic types, typical only for the late Milanovce and Flomborn-Zofipole phases at Brunn 3 and Schwanfeld.

All other sites in Germany contain these types. At the same time, the Schwanfeld collection contains some early types of vessels, which are absent in the collection of the Flomborn-Zofipole sites. Primarily, there are types, which are found only at Schwanfeld and the Formative phase sites. From this point of view, the comparison of house 11 of Brunn 2 with house 15 of the Schwanfeld settlement is quite interesting, because we reckon house 11 belongs to the Formative phase Brunn 2 (STADLER & MINNICH, 2021, Table 9: 2).

Low bowls with a slightly indrawn upper part were found only at Schwanfeld and Szentgyörgyvölgy Pityerdomb (Fig. 9, 5-7; BÁNFFY, 2004, Fig. 87: 1; 108: 6; 110: 4; 120: 9; 126: 12). Low bowls with a convex upper part and a rib (Fig. 9, 3-4) as well as high bowls with an indrawn straight neck and a roundish body with the maximum diameter in the upper part of their body were found at Schwanfeld and Brunn 2 (Fig. 9, 1-2; STADLER & KOTOVA, 2019, pl. 92: 200; 163: 19; 194: 8; 194: 1; 208: 10; CLADDERS, 2001, Taf. 59, 5).

Some types of bowls were used at the Formative phase sites and at the earliest sites of the Milanovce phase. Biconical high bowls with a straight upper part were present at Schwanfeld, Brunn 2, Szentgyörgyvölgy Pityerdomb, Bíňa, and Bernolakovo (Fig. 10). Low bowls with a straight upper and low part and a rib were found only at Schwanfeld, Brunn 2 and 3 (Fig. 11). Biconical high bowls with a rib and a concave upper part are known from Schwanfeld, Bíňa and Sármeľék (Fig. 12, 1-4). Two types of knobs were common for the Brunn 2, Szentgyörgyvölgy Pityerdomb, Schwanfeld, and Brunn 3 ceramics: the original type of knobs – a notched oval knob, each hump

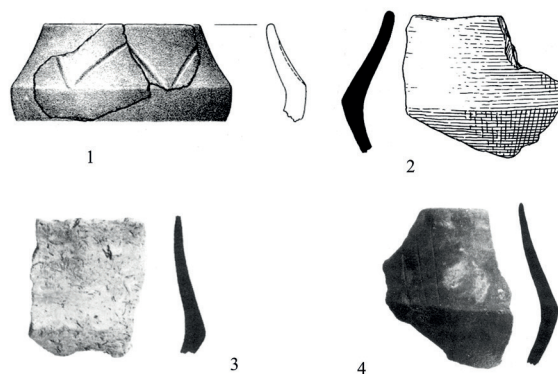


Fig. 12 Ceramics of the Early Linear Pottery culture: 1 – Schwanfeld (according to CLADDERS, 2001); 2 – Bíňa (according to PAVÚK, 1980); 2, 4 – Sármeľék (according to KALICZ, 1983).

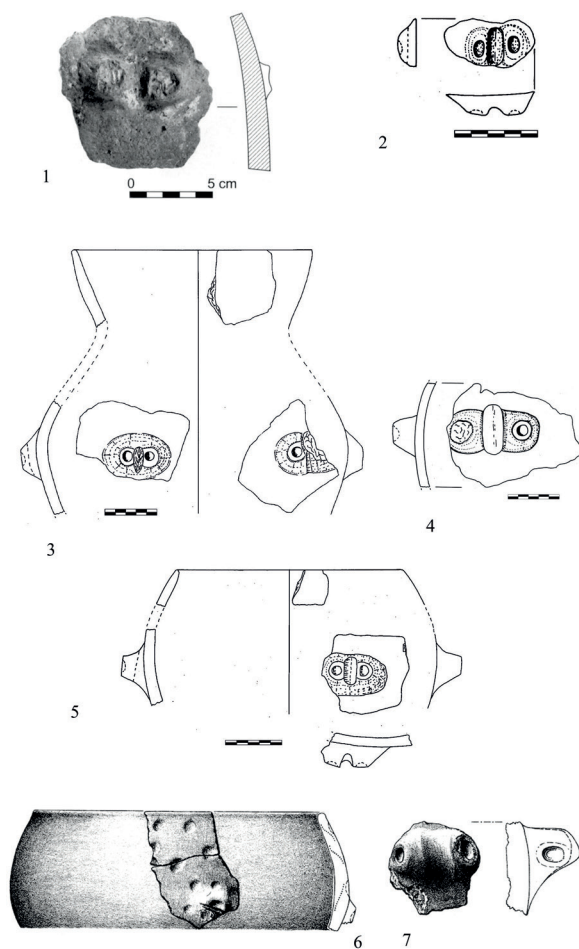


Fig. 13 Ceramics of the Early Linear Pottery culture: 1 – Szentgyörgyvölgy Pityerdomb (according to BÁNFFY, 2004); 2 – Brunn 2; 3 – 5 – Brunn 3; 6, 7 – Schwanfeld (according to CLADDERS, 2001).

with a pit (Fig. 13) and an oval knob with five pits (Fig. 14). Some elements of decoration were the same only for the Schwanfeld as well as the Brunn 2 and 3 sites: single pits under a rim of low bowls (Fig. 15, 1-3); pits on a body of high bowls with a neck and roundish body (Fig. 15, 4-6). Stocky high bowls without a neck, with a convex upper part and the maximum diameter in the upper part occurred only at Brunn 3 and 4 (Fig. 16, 1-4; STADLER & KOTOVA, 2021, Pl. 105: 41; 175: 18; 179: 36; 190: 9) and Schwanfeld (Fig. 16, 5). Vessels with similar shapes and decoration occurred in different houses of Brunn 3 (houses 34, 35, 36, 37, 39, 40, 42) and Schwanfeld (houses 9, 11, 12, 15, 18, 19).

We had a chance to compare the ceramic technology of the Schwanfeld and Brunn 3 sites. As with Brunn 3, pottery with a lot of plant remains and a small amount of sand dominated in the Schwanfeld collection. As a feature distinct from

the Formative phase sites, which had numerous ceramics with a thick engobe layer, Schwanfeld and Brunn 3 have a large group of pottery with a very thin engobe. It is comprised of the “sandwich” type, which consists of only light-brown or light-yellow thin layers and a thick black or grey layer in the centre. This pottery included different low and high bowls and can be named “semi-coarse.” Classic fine pottery with a polished surface is absent at Brunn 3 and makes up to 5% at Schwanfeld. The Brunn 3 pottery was made from clay with or without mica. The Schwanfeld ceramics did not have mica in the clay. Using a lot of plant remains in pottery production was not typical for the later sites, for example, Bruchenbrücken and Frankfurt Niedereschbach. As we can see, ceramic technology and some types of high and low bowls and forms of decoration occurred only at Schwanfeld and the Formative phase sites (Brunn 2 and Szentgyörgyvölgy Pityerdomb) as

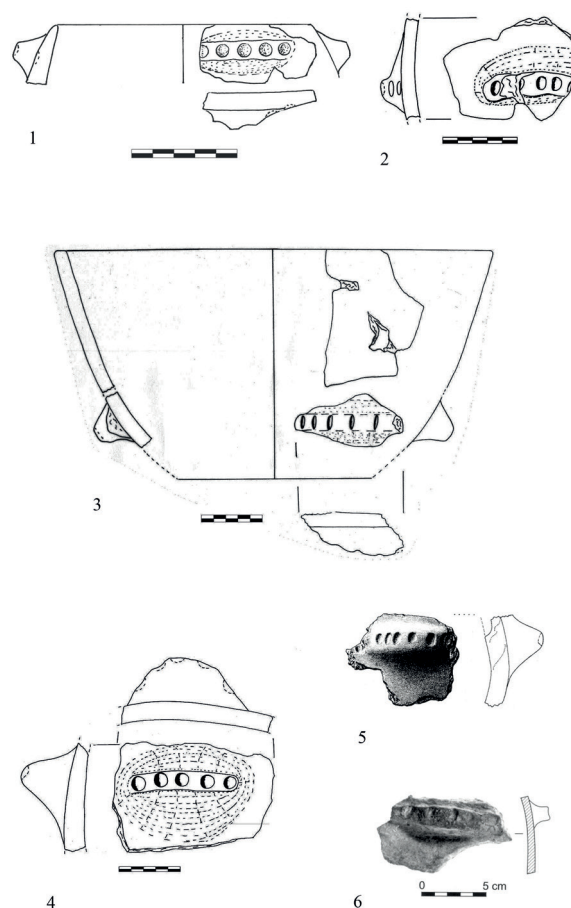


Fig. 14 Ceramics of the Early Linear Pottery culture: 1 – Brunn 2; 2 – 4 – Brunn 3; 5 – Schwanfeld (according to CLADDERS, 2001); 6 – Szentgyörgyvölgy Pityerdomb (according to BÁNFFY, 2004).

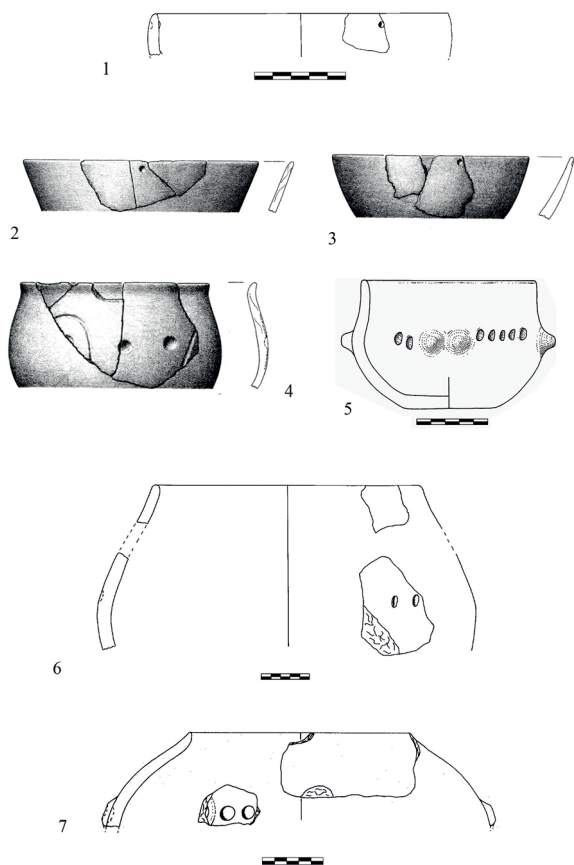


Fig. 15 Ceramics of the Early Linear Pottery culture: 1, 6, 7 – Brunn 3; 2 – 4 Schwanfeld (according to CLADDERS, 2001); 5 – Brunn 2.

well as at the sites of our early part of the parabola of the correspondence analysis (Bíňa, Bernolakovo and Sármešlék). These types are absent at other Early Linear Pottery sites in Germany, the Czech Republic, and Poland.

We have data on isotopic analyses for two burials from Schwanfeld and two burials at the Brunn 2 site. One individual from each site was accompanied by numerous trapezoidal arrows (LÜNING, 2010; STADLER, 2019). Both men were born far from these settlements (KNIPPER & PRICE, 2010; NIKITIN ET AL., 2019). The Brunn individual #2 was buried after the destruction of house 14 at the Brunn 2 site at the end of the Brunn 2 settlement or the beginning of the settlement following the Brunn 5 site (being dated to the early subphase of the Milanovce phase). This grave is dated to 5490-5360 calBC. It contained numerous items from radiolarite sourced from around 200 km southeast at Bakony Szentgál, near Lake Balaton in western Hungary (STADLER, 2019). Numerous radiolarite tools at the Brunn 2 and 3 sites demonstrate close contacts between the Brunn inhabitants and the Hungarian

Neolithic population over a period of 400 years. Additional evidence of these connections is represented by imported pottery at the Brunn 2 and 3 sites, which at Brunn 2 are identical with the simultaneous ceramics of the Formative phase of the Linear Pottery culture in Hungary and the Late Starčevó pottery, and with the Early Linear Pottery culture vessels from Brunn 3, also from Hungary (KOTOVA & STADLER, 2019a: 269; KOTOVA & STADLER, 2021: 87).

The aDNA complex of individual #2 shows that he had an aDNA typical for the Anatolian Neolithic from his father, but his mother belonged to the European hunter-gatherers (NIKITIN ET AL., 2019). It is possible to assume that he was born in western Hungary, where a man with the Anatolian Neolithic or closely related Neolithic Balkan farmer's DNA complex met a woman with a local aDNA complex of European hunter-gatherers. On the base of a few radiocarbon dates without analysis of possible reservoir effect, the Schwanfeld "hunter-warrior" burial is dated to 5560-5480 calBC (KNIPPER & PRICE, 2010). This man originated from an area with geologically young volcanic bedrock. Considering the long-distance relations implied by his grave goods, the man most likely came from the Bohemian low mountain ranges.

Discussion¹⁶

For a long time, the Schwanfeld site was estimated as one of the earliest in Germany. In the last years, H.-Chr. Strien has considered it as a long-lasting site (2018, 90) and analyses a seriation of the Early Linear Pottery sites (STRIEN, 2014; 2018; 2019), which is based on the modern database of ceramic materials. Our seriation and correspondence analysis has some divergences with Strien's results. We and H.-Chr. Strien used a different number of sites and ceramic types. He included a larger number of sites, but only one to three finds from some settlements are considered in the seriation (STRIEN, 2014, Tab. 6). We eliminated long-used types and sites with few types available for analysis. Our results show that late types of vessels and decoration typical for the Flomborn-Zofipole phase are missing in the Schwanfeld collection. This fact, together with early ceramic types, allows an estimation of this collection as the earliest one among all published materials from the German territory.

Architectural similarities can be found among the houses from Brunn over a relatively long period of time, as well as among houses located far away, such as the houses from Schwanfeld. Inter-

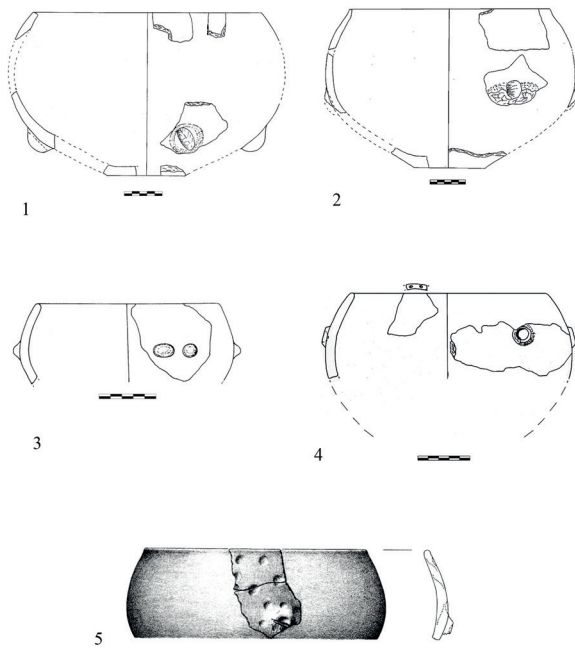


Fig. 16 Ceramics of the Early Linear Pottery culture: 1 - 3 – Brunn 3; 4 – Brunn 4; 5 – Schwanfeld (according to CLADDERS, 2001).

estingly, house 16 of the Schwanfeld settlement seems to be a direct architectural twin of house 38 of Brunn am Gebirge, Wolfholz. A coincidence is rather unlikely, as both houses belong to the category of trapezoidal houses, which seem to represent a house type of their own and show a clear trend towards the west (MINNICH, 2022, chapter 4.1). The exciting question that will have to be clarified in the future is whether measurements were taken from one house and then transferred to a new building site (which could also be far away) or whether there was a common system of measurements with a certain idea of how individual houses should be constructed. At present, both lines of thought are certainly conceivable, and one would not theoretically exclude one or the other, so intensive work is being done on a comprehensive database to investigate these exciting questions more closely in the future in order to link material culture with architectural analyses (MINNICH, 2022/2023 in prep.).

Schwanfeld is in the lower arch of our complex parabola of the correspondence analysis together with Brunn 2, 5, 3, Becsehely, Bruchenbrücken, Strögen, Eitzum, Wang, and Brunn 4 (Fig. 8). These sites are chronologically heterogeneous and have similar ceramic types, which, perhaps, shows a connection of their origin with the Austrian variant sites of the Formative phase. Up to now, the Brunn 2 site had contained the only, yet

significant sample of them. It is possible to assume a migration of the Brunn 3 inhabitants or related people upstream of the Danube and later to the Main drainage. Schwanfeld is now the only site in Germany which marks the beginning of this migration. A group of younger sites (Wang in the Danube drainage, Bruchenbrücken in the Main drainage, and Eitzum in the Weser drainage) demonstrates the further development of migrants during the late subphase of the Milanovce phase. Significant architectural similarities with the houses of Brunn 3 could also be documented for this group. It is possible that all these German sites create an own arch of the parabola (light purple), which shows their synchronous existence with the Austrian sites. The Becsehely collection could show the Hungarian connections of this group of the Early Neolithic population.

Statistical analysis of radiocarbon dates from the Linear Pottery culture has shown that the Brunn 3 site existed between 5340-5265 cal-BC. It is considered to be within the early subphase of the Milanovce phase (STADLER & KOTOVA, 2021b). We assume that Schwanfeld has a similar age.

Habitants of the Brunn 2 and 3 sites had close connections with their neighbours in Hungary, mainly for receiving raw materials for tool production. People from Schwanfeld kept in a touch with their neighbours in Bohemia and with the La Hoguette people. These contacts of the LPC newcomers caused a specificity of the Linear Pottery sites in Germany.

Notes

¹ Corresponding author.

² Contribution Nadezhda Kotova.

³ For more information about the Montelius image database see: https://www.academia.edu/4426327/Stadler_Peter_2015_Quantitative_Methods_with_Image_Database_Montelius_and_Software_Package_WinSerion_for_Archaeologists_Examples_of_Different_Analyses_160p_136f_Version_from_14_06_2015 [14.4.2022].

⁴ Contribution Peter Stadler.

⁵ Contribution Alexander Minnich.

⁶ These run parallel to each other, for example, even with trapezoidal floor plans.

⁷ This work is also currently being continued in a database, which actually contains about 1000 such modules (24.2.2022).

⁸ Querpfeilerreihe 20.

⁹ Contribution Alexander Minnich.

¹⁰ Interestingly, the first four modules of house 15 from Schwanfeld have a total area of about 28 m² and are thus comparable in size to the post-free interior (module 2) of house 38 from Brunn 3 with 26 m² (see Fig. 7). With a total area of 28 m², modules 6, 7 and 8 of house 15 are the exact same size as modules 1 to 4, which speaks for targeted construction planning.

¹¹ Fig. 7 also shows the total length of these outer ditches. At house 16 from Schwanfeld, this length is around 13 metres. The corresponding counterparts of house 38 of Brunn were designed almost identically with 12 metres (west) and 13 metres (east).

¹² If, for example, module 5 is subtracted from the total area of all modules of house 38, this results in an area of 60 m², which is the same size as the total area of all modules of house 16.

¹³ At house 11 of Brunn, the area of modules 2 and 3 together is around 29 m², while the area of module 5 at house 15 of Schwanfeld is around 30 m².

¹⁴ Contribution Jens Lüning.

¹⁵ Contribution Nadezhda Kotova.

¹⁶ Contribution all authors.

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