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Early Neolithic Settlement Brunn am Gebirge, Wolfholz,
in Lower Austria
Volume 3

Early Neolithic Settlement Brunn am Gebirge, Wolfholz,
Site 4 in Lower Austria and the End of the Milanovce Phase
of the Linear Pottery Culture (LPC)

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Foreword by Volume Editor

This book is devoted to publishing the ceramics from the Brunn 4 site and some problems of the Early Linear Pottery culture (Early LPC). Chronologically, Brunn 4 was the third site among the early LPC settlements near Brunn am Gebirge, Wolfholz. The main part of the materials from the Brunn 2 and 3 sites have already been published.¹

This book consists of two parts. The first of them includes ceramic materials of the Brunn 4 site. The second part is devoted to rethinking materials of the Early LPC on the background of the numerous collections of the sites near Brunn am Gebirge. The Brunn materials have demonstrated a unique sequence of the sites with clear complexes of the main stages of the Early LPC. Together with our image data base Montelius, it gives us the possibility of defining the periodisation of the Early LPC more precisely. We used a seriation of the main part of the published sites for a better understanding of the placement of the Brunn 1, 2, 3, 4, and 5 sites among other early sites of this culture. We were lucky enough to have the chance to work with some of the Early LPC collections and create our own impressions of the materials, which represent a valuable addition to previously published data. We are very grateful to Eva Lenneis and Ernst Lauermaun for the possibility of introducing us to the materials from Strögen. Eszter Bánffy helped us view some pots from Szentgyörgyvölgy Pityerdomb. László András Horváth showed us the Zalaegerszeg Andrásida and Budapest sites. Thanks to Juraj Pavúk, we were able to work with the materials of the Břňa, Hurbanovo, Milanovce and Bernolákovo sites. Sławomir Kadrow gave us the chance to see some Early LPC collections in Poland. Due to Jens Lüning, we have seen the Schwanfeld collection. Tessa Engelbrecht helped us to be introduced to materials from the Bruchenbrücken and Frankfurt Niedereschbach sites.

Hans-Christoph Strien showed us materials from Oedheim, Rottenburg Hailfingen, and Stuttgart Mühlhausen Viesenhäuser Hof. During our work with the Early LPC materials, we had very interesting and important discussions with Juraj Pavúk and Hans-Christoph Strien.

1 Stadler/Kotova 2019; Stadler/Kotova 2021; Minnich 2022.

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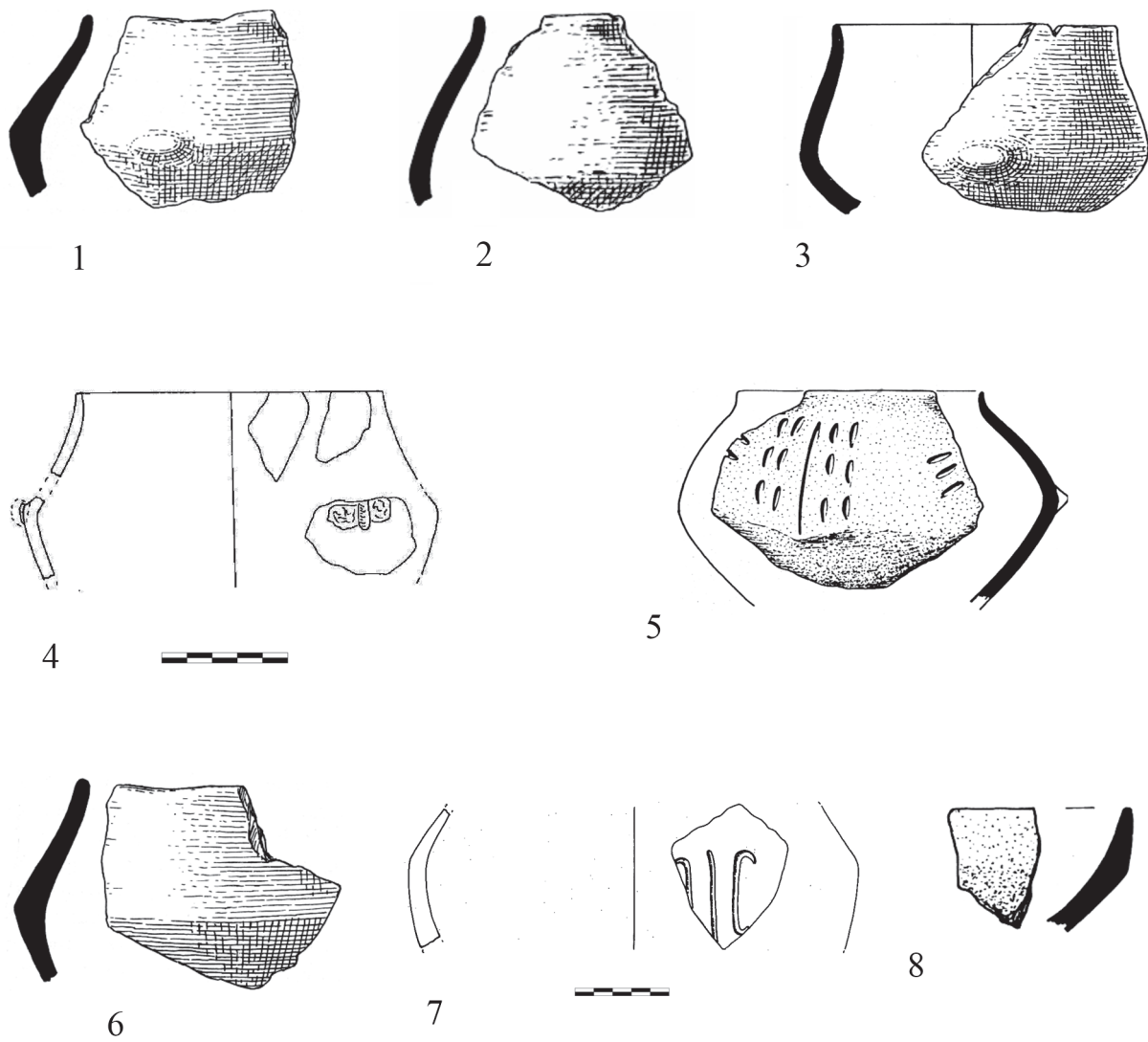


Figure 7.3: Types of pottery which are located far from the parabola: 1 – 3, 6 – Bíňa; 4, 7 – Brunn 3; 5, 8 – Medina. According to Pavúk 1980; Kalicz 1995; Stadler/Kotova 2021.

7.2. Correspondence Analysis for the Linear Pottery Sites

The parabola on Figure 7.4 shows the 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 (lower part, green dots, Figure 7.5) and the early sites of the Milanovce phase (upper part, blue dots). The right part of the parabola includes the late sites of the Milanovce phase (near the peak, pink dots) and the sites of the Flomborn-Zofipole phase

in the lower part (red dots). We see gaps between accumulations of sites, which belonged 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 vertical line from the peak of the parabola to its base.

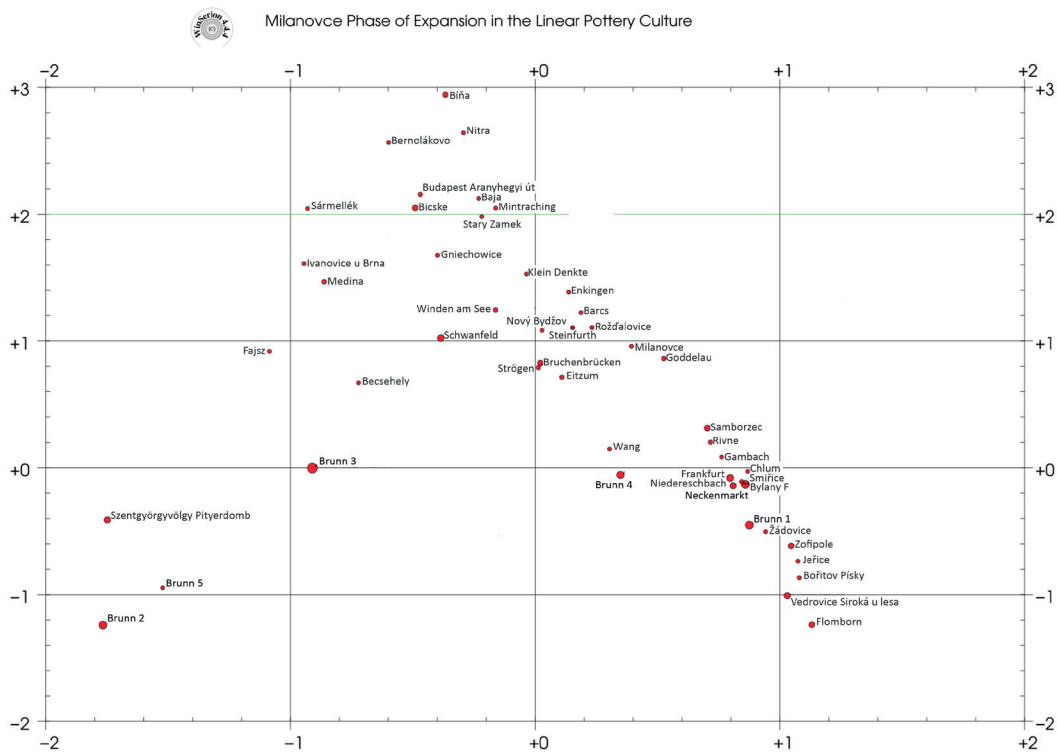


Figure 7.4: The parabola of the Correspondence Analysis, Sites.

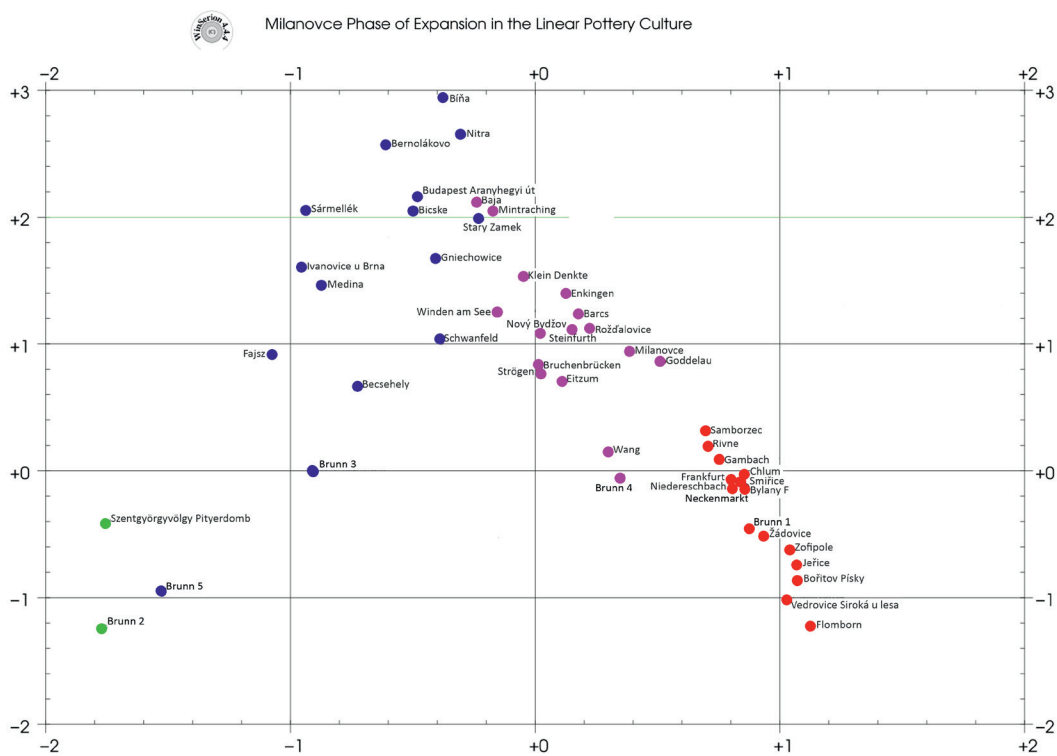


Figure 7.5: The parabola of the Correspondence Analysis: green dots – the sites of the Formative phase; blue dots – the sites of the early subphase of the Milanovce phase; pink dots – the sites of the late subphase of the Milanovce phase; red dots – the sites of the Flomborn-Zofipole phase.



Figure 7.6: The complex parabola of the Correspondence Analysis.

We can see isolated points on the left, where the earliest sites are located. Brunn 2 is the earliest of them, the next is Szentgyörgyvölgy Pityerdomb (Figure 7.5). Both sites of the Formative phase demonstrate a distance from each other and the other collections. The small collection of Brunn 5 shifts to the right side of these sites, in the direction of the younger sites. The Brunn 3 site is far from all these sites, as well as from the next group of the earliest Milanovce sites. The isolated points of the early Milanovce sites reflect the remarkable differences of their pottery and chronological dispersion. The sites of the later Milanovce subphase and the Flomborn-Zofipole phase have a dense accumulation. This fact can testify similarities of their ceramics in the framework of each group.

This parabola consists of some lines or arches due to the inclusion of sites from different areas: Austria, the Czech Republic, Germany, Hungary, Poland, and Slovakia (Figure 7.6). The red frame surrounds the sites of the Flomborn-Zofipole phase, which will be considered in the next book about the Brunn 1 site. The lowest arch of the complex parabola consist of different purple tones (light tone for

the sites from Germany, dark tone for the Austrian sites).

It includes Brunn 2 (the Formative phase), Brunn 5, 3, Becsehely, Schwanfeld (the early subphase of the Milanovce phase), Winden am See, Bruchenbrücken, Strögen, Eitzum, Wang, and Brunn 4 (the late subphase of the Milanovce phase). These sites have the most numerous similar ceramic types. We can interpret their similarity because of a migration of the Brunn 3 inhabitants or related people upstream of the Danube and later to the Main River Basin. Schwanfeld on the Main River is the only site in Germany here which belonged to the early subphase of the Milanovce phase. It marks the beginning of this migration. A group of younger sites (Wang in the Danube Basin, Bruchenbrücken in the Main Basin, and Eitzum in the Altenau Basin) demonstrates the further development of migrants during the late subphase of the Milanovce phase. 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.

The beginning of the late Milanovce subphase correlates with the Winden am See site on Lake Neusiedl (Austria). As with Becsehely, Winden am See marks the southern connections of this Early Neolithic group, but a little later, in the middle of the Milanovce phase.

The second part of the parabola consists of the Hungarian sites (dark yellow colour): Szentgyörgyvölgy Pityerdomb (the Formative phase), Fajsz, Medina, Bicske, Budapest Aranyhegyi út (the early subphase of the Milanovce phase), Baja, and Barcs (the late subphase of the Milanovce phase). The right, descending part of the parabola is more unified. The Barcs and Baja sites of Hungary (dark yellow) are near the German sites (Mintraching, Enkingen, Steinfurth).

Most sites from the Czech Republic were eliminated because too few types were available for analysis. Only three sites are considered to be in the framework of the Milanovce phase: Ivanovice u Brno in the early subphase, Rožďalovice and Nový Bydžov in the late subphase. It is interesting that Ivanovice u Brno is among the early Hungarian sites, not in the Austrian-German inner arch. It means its materials are closer to Medina in Hungary than to the Austrian sites, which are territorially located in the middle of the distance between the Southern Hungarian sites and Moravia. This fact shows a possible migration of the Early Neolithic population from Hungary to Moravia along the Danube and its tributaries evading the Vienna Basin. We assume that Ivanovice u Brno and Nový Bydžov (brown dots) are part of one parabola for the Czech Republic, but Rožďalovice could be a point in the branch of the parabola with the Barcs, Baja, Mintraching, and Enkingen sites.

An own branch of the parabola is created by two sites from Western Poland (Gniechowice and Stary Zamek) together with two German sites (Mintraching and Steinfurth). However, we do not exclude that new sites of the late Milanovce period in Poland will correct this picture. It is interesting that Stary Zamek, which belonged to the transition from the early subphase to the late subphase of the

Milanovce phase, is located near the Hungarian sites. Gniechowice is also closer to the Hungarian sites than to the Austrian inner parabola. We assume that they were the result of the same migration of the Early Neolithic population from Hungary to Moravia along the Danube and its tributaries and then to the Oder Basin.

The third short arch of the parabola relates to its peak. It is represented by Bernolákovo, Bíňa, and Nitra in Slovakia, as well as the Sármellék site in Hungary. They are separate from other sites. While the distribution of the main part of the parabola spans from -1.4 to +1.6, the group of Hungarian sites lies between +2 and +2.2, and the early Slovakian sites between +2.6 and +3. Three sites above the main body of the parabola (Bernolákovo, Bíňa, and Nitra) can be considered as sites untypical for the Early LPC. However, they demonstrate a development of the early tradition of one area. The Sármellék site in Hungary is at the beginning of this arch. The Slovakian sites contain numerous untypical vessels and decoration. The most numerous of these vessels are from Bíňa, which is the farthest site of the parabola. The sites around line +2, except for Mintraching, contain a few untypical ceramic types. It is possible that the right branch of the "Slovakian arch" of Sármellék, Bernolákovo, Bíňa, and Nitra is created by the late Milanovce site in Slovakia (Milanovce) and Goddelau in Germany. This parabola can be named "Danubian parabola" as its sites are located near the Danube River: Baja, Budapest Aranyhegyi út, and Bicske. Mintraching is also situated near the Danube River. It is the closest site to the Hungarian area of all German sites. We can assume that its appearance is related to a migration of the LPC people upstream of the Danube River.

It is very important that the sites in Germany do not create an own parabola. They are parts of different parabolas. Some of them are a part of the Brunn inner parabola (Schwanfeld, Bruchentrüben, Eitzum, Wang). The Eitzum site could have belonged to the migrants, which were related to the Bruchentrüben inhabitants (the Brunn arch).

The Klein Denkte and Steinfurth sites are located in one parabola with the sites in Western Poland, Mintraching, and Enkingen together with the Hungarian sites, Goddelau, and the Slovakian sites. We assume that this fact testifies the different origin of their inhabitants and shows the regions of the Early LPC from which migrants came to the German sites.

7.3. Conclusions

The Correspondence Analysis of the types of vessels and their decoration has defined some which were not typical for the main part of the Early LPC sites. These types mark the group of sites in Slovakia related to the Milanovce phase (Bíňa, Nitra, Bernolákovo, and Milanovce) as well as some sites in Hungary (Bicske and Budapest Aranyhegyi út), which are located in the Danube Basin not far from Slovakia.

The Correspondence Analysis of the sites shows a complex thick arch, which can be divided into some narrow arches. Sites from different arches located opposite each other are synchronous. We describe each arch as a sequence of sites of different territorial variants of the Early LPC. Some arches include sites from another area, for example Becsehely in the Brunn arch. The single sites from the Czech Republic and Poland could be part of their own arches, but the small number of them does not offer the possibility to create these arches. The location of the sites in Germany in different arches is interpreted as a mark of their different origin.

Thus, now we interpret the result of our Correspondence Analysis for sites as a reflection of the chronological position of sites and indication of their genesis.

Chapter 8. The N Next Neighbours Analysis and Variants of the Early Linear Pottery Culture

8.1. The N Next Neighbours Analysis

We applied the N Next Neighbours Analysis with respect to a type. This method connects all sites in this evaluation with help of the program Google-Mapper. As opposed to the Correspondence Analysis, the coordinates of the sites involved play a key role.

At first, all distribution maps are created and tested regarding if they are random distributions or not. All non-random maps are used in further analyses. This N Next Neighbours Analysis (ANN1) compares all the individual mappings and converts the maps with the same tendencies into a single combined map. The same colours and the same symbols show the most similar sites, while the same colours with different symbols indicate sites that are less related to each other. And lastly, sites with different colours are the least related.

8.2. N Next Neighbours Analysis for the Formative and Milanovce Phases of the Early Linear Pottery Culture

The results of our N Next Neighbours Analysis can be seen in Figure 8.1. It shows four groups of sites.

The western group (red colour) includes Rožďalovice in Bohemia and the sites in Germany, excluding Wang. Only Schwanfeld belonged to the early Milanovce subphase. Other sites are associated with the late Milanovce. A specific feature of this group's decoration are pits under the rim, which were applied even on low bowls and pots (#&Ornament00920-00940 in Table 6.13 of Chapter 6), only pits on the rim of biconical vessels are not known. There is only a single vessel with a plastic band. Oblong and stocky high bowls with a vertical straight neck and a roundish body (Type 16, subtype 1 in Table 6.5 of Chapter 6) were made only

at the German sites during the Milanovce phase. The central group (purple colour) consists of the Brunn 2, 3, 4, 5 sites and Winden am See in Austria, Bernolákovo in Slovakia, Ivanovice u Brno in Moravia, and Wang in Germany. Brunn 2 represents the Formative phase, Brunn 3 and 5 as well as Bernolákovo and Ivanovice u Brno belong to the early Milanovce subphase. Brunn 4, Winden am See, and Wang are part of the late Milanovce subphase. This group has a clear combination of specific features: an absence (in Brunn 3, 4 and 5) of fine pottery, a domination of coarse pottery, and a gradual increase in the number of semi-coarse bowls. Also, only this population made round knobs with a pit in the centre on pots and amphorae. A vertical zig-zag (#&Ornament 00740, Table 6.13 of Chapter 6), complicated compositions of vessels with a pedestal (#&Ornament00710), a widespread decoration with pits (#&Ornament00770), including pits on a handle (#&Ornament00820), pits on a rib (#&Ornament00850), on the rim of biconical vessels (#&Pit on a rim00010), and vessels with a neck (amphorae or pots, #&Pit on a rim00060-00080) occurred. However, pits under the rim (#&Ornament00920-00940) were not typical. During the Formative phase and early Milanovce subphase, plastic bands on amphorae and on the rib of biconical vessels, open bowls, bowls with a neck, and on pots (#&Ornament00950-00980; 01010; 01020) are known only in this group.

Some features appeared in this group from the beginning of the Milanovce phase, but they came into use in other variants only during the Flomborn-Zofipole phase. There are notched oval knobs with pits near the knob (#&Knobs00040 and 00060, Table 6.12 in Chapter 6), secondary decoration with the symbols "V" and "U" (#&Ornament00250, Table 6.13 of Chapter 6, Brunn 3 and 4, Wang).

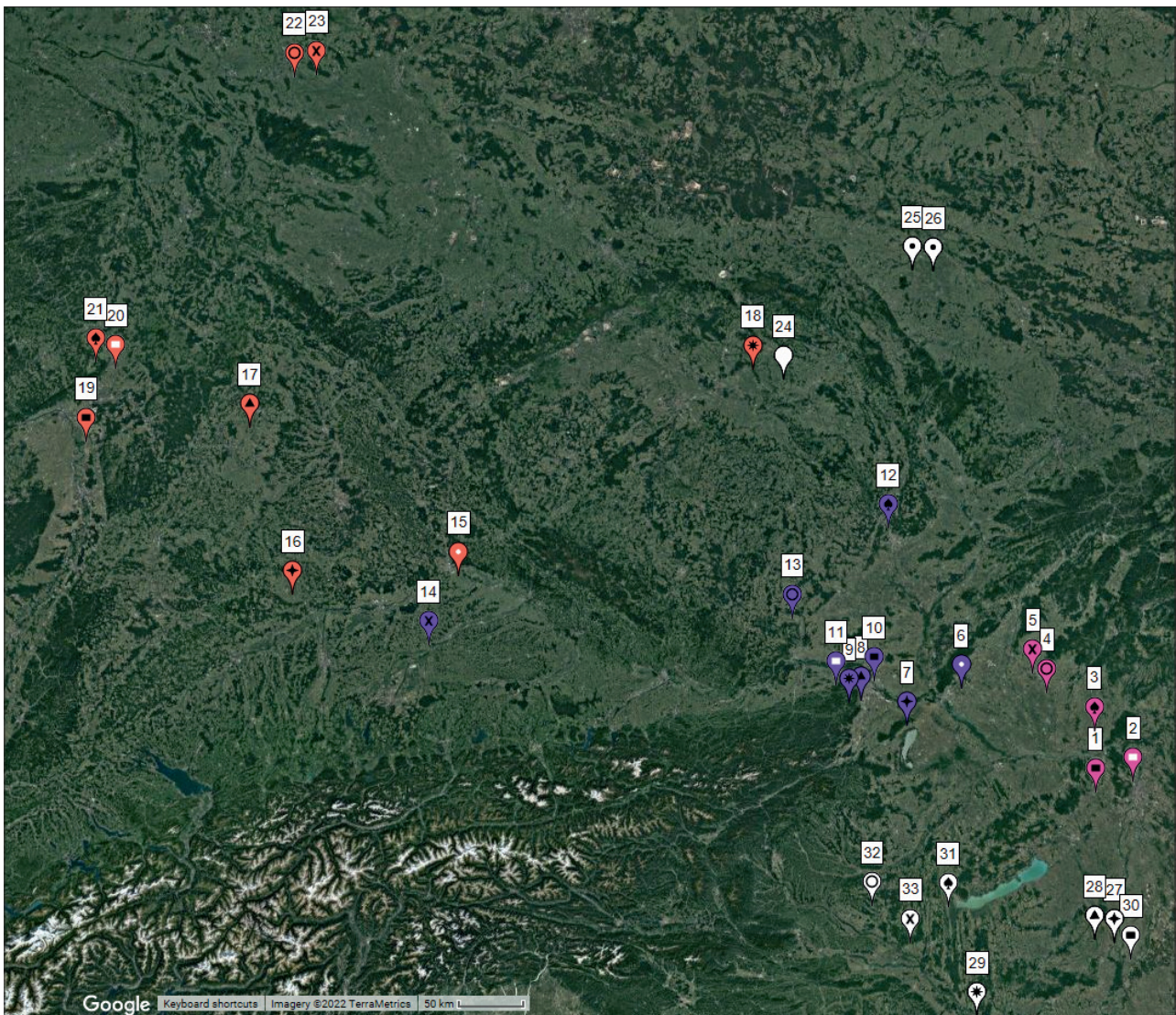


Figure 8.1: The result of the N Next Neighbours Analysis for the Formative and Milanovce phases of the Early Linear Pottery culture: 1 – Bicske, 2 – Budapest Aranyhegyi út, 3 – Bfña, 4 – Milanovce, 5 – Nitra, 6 – Bernolákovo, 7 – Winden am See, 8 – Brunn 2, 9 – Brunn 3, 10 – Brunn 4, 11 – Brunn 1, 12 – Ivanovice u Brna, 13 – Strögen, 14 – Wang, 15 – Mintraching, 16 – Enkingen, 17 – Schwanfeld, 18 – Roždalovice, 19 – Goddelau, 20 – Steinfurth, 21 – Bruchenbrücken, 22 – Klein Denkte, 23 – Eitzum, 24 – Nový Bydžov, 25 – Gniechowice, 26 – Stary Zamek, 27 – Fajsz, 28 – Tolna Medina, 29 – Barcs, 30 – Baja, 31 – Sármellék, 32 – Szentgyörgyvölgy Pityerdomb, 33 – Becsehely.

Numerous shapes of vessels have been found only at the sites of the central group. There are amphorae with a convex neck (#&Shape00110, Tables 6.1 in Chapter 6), high bowls with a concave neck and biconical body (Types 2 and 3 in Table 6.5 of Chapter 6), high bowls with an indrawn concave neck and a roundish body of a large diameter (Type 7, subtype 2 in Table 6.5), strongly closed high bowls without a neck with the maximum diameter in the middle of the body and with an everted neck

(Type 30, variant 1 in Table 6.5), open high bowls with a short and slightly convex upper part of the wall (Type 45 subtype 2 in Table 6.5), open and stocky high bowls with a vertical short upper part and a curvature (Type 52, variant 2 in Table 6.5).

Plates with a convex upper part and without a curvature (Type 2 in Table 6.8 of Chapter 6) as well as plates with a slightly convex wall and with a curvature (Type 3) were typical for this group. Pots with tall and short indrawn necks

(#Shapes02130-02150 and 02180-02220 in Table 6.9 of Chapter 6) as well as an arched shape of pedestals (Type 4 in Table 6.11 of Chapter 6) and oblong high bowls with a pedestal (Type 1, variant 1 in Table 6.10 of Chapter 6) have been reconstructed only for the central variant. Numerous biconical and subbiconical vessels (Tables 6.2 and 6.3 Chapter 6) were also only typical for this variant.

The smallest eastern group (pink colour) unites Bicske and Budapest Aranyhegyi út in Hungary as well as Bíňa, Nitra, and Milanovce in Slovakia. Only Milanovce belongs to the late subphase, other sites relate to the early Milanovce subphase. We would also like to consider the Bernolákovo site in this group. However, WinSerion attributes it to the central variant. The relatively high percentage of fine vessels, finger pinches in the decoration (#Ornament0030, Table 6.13 Chapter 6), and two linear upward arches (#Ornament00550) were typical for this group. But the last type of decoration is also known at Bernolákovo. This group of people very rarely created impressions under the rim (#Ornament00920-00940) and plastic bands. Tall bowls with an indrawn straight neck and a biconical body are present only in this variant (Type 9 in Table 6.5 of Chapter 6). Types located outside of the parabola in the Correspondence Analysis for ceramic types are concentrated in this variant.

The fourth (southern) group includes Szentgyörgyvölgy Pityerdomb (the Formative phase), Sármellék, Becsehely, Fajsz, and Medina (the early Milanovce subphase), as well as Barcs and Baja (the late Milanovce subphase) in Hungary. It is interesting that the Nový Bydžov site in Bohemia (the late Milanovce subphase), Stary Zamek, and Gniechowice (the early Milanovce subphase) in Western Poland also belong to this group. Three lines creating a vertical angle (#Ornament00390 Table 6.13 Chapter 6), pits under the rim (#Ornament00920-00940), and linear net compositions were typical for the early subphase of the Milanovce phase as well as decorations of insides of low bowls (#Ornament00150 and 00160, Table 6.13). On the other hand, vessels with plastic bands are rare. Pits on the rim of biconical vessels were not produced.

8.3. The Combination of the Results of the Correspondence and the N Next Neighbours Analysis

Earlier we distinguished two local variants for the Formative phase: the Austrian and the Hungarian.⁷⁷ The first period of the Brunn 2 site (5660 – 5460 BC) is the earliest site of the Formative phase now and it does not have any analogies yet. It is located in the Vienna Basin, with Austria seemingly being the initial core of the Linear Pottery culture. The second period of the Brunn 2 site was synchronous with Szentgyörgyvölgy Pityerdomb and Zalaegerszeg-Andráshida in Hungary. They are attributed to the second period of the Formative phase (5480 – 5360 BC). For this time, we can define two local variants. The full publication of the Szentgyörgyvölgy-Pityerdomb site⁷⁸ allows for a comparison of its collection with Brunn 2.⁷⁹

The difference in the technology of pottery production is an important aspect for their definition. The Austrian variant is characterised by the pottery with a lot of plant admixture in the clay, thick and soft layers of engobe on surfaces, a widespread use of decoration with plastic bands and pits, and the absence of the “rain” ornamentation. The Hungarian pottery variant has significantly less plant remains in the clay and a burgundy-coloured hard layer with a lot of mica on the surface. “Rain” ornamentation was used in the Hungarian variant, whereas plastic bands and pits decorated only a single vessel. The Brunn 2 and Szentgyörgyvölgy-Pityerdomb sets of pottery contain a similar percentage of low bowls as well as biconical and globular vessels, but the pots with a neck and tall bowls were more numerous in the Szentgyörgyvölgy-Pityerdomb set. A specific feature of the Brunn collection is the higher number of vessels with a pedestal.

Four variants are distinguished from the early Milanovce subphase, but they have an uneven distribution of sites.

⁷⁷ Stadler/Kotova 2019a: 849.

⁷⁸ Bánffy 2004.

⁷⁹ Kotova/Stadler 2019a, 354.