

Origin and contacts of people buried at the LBK graveyard at Kleinhadersdorf, Austria

Christine Neugebauer-Maresch¹, Eva Lenneis²

¹ Austrian Academy of Sciences, Vienna, AT
Christine.neugebauer-maresch@oeaw.ac.at

² University of Vienna, Vienna, AT
eva.lenneis@univie.ac.at

ABSTRACT – *In this article we present first information on results of analyses of the Linearbandkeramik (LBK) graveyard of Kleinhadersdorf carried out in recent years. First, we briefly present the excavations and main characteristics of the burials. Analyses of C-, N- and Sr- isotopes, executed within a large-scale international project, showed that most of the people were born and lived in the area and gathered food nearby. Only three individuals came from a geologically different region, i.e. the gneiss-granite zone of the Bohemian massif. Adzes and some quern stones were also obtained in this area, while flint raw materials and Spondylus shells for ornaments were procured from other regions.*

IZVLEČEK – *V članku predstavljamo prve rezultate analiz, ki so bile opravljene v zadnjih letih na materialu iz grobišča Kleinhadersdorf iz obdobja linearno-trakaste keramike. Najprej bomo predstavili izkopavanja na grobišču in glavne značilnosti pokopov. Analize izotopov ogljika (C), dušika (N) in stroncija (Sr), ki so bile opravljene v obsežnem mednarodnem projektu, so pokazale, da so bili ljudje, ki so pokopani na tem grobišču, rojeni in so živeli v okolici najdišča, kjer so tudi nabirali hrano. Le trije posamezniki so prišli iz območja, ki se geološko razlikuje od okolice Kleinhadersdorfa, in sicer iz območja z gnajsi in graniti, ki se nahajajo v češkem gorovju. Kamnite sekire in nekateri mlinjski kamni, ki so bili odkriti na grobišču, so izdelani iz lokalnih kamnin, druga kamnita orodja in školjke Spondylus, ki so jih uporabljali za izdelavo nakita, pa so pridobivali v drugih regijah.*

KEY WORDS – *Early Neolithic in Central Europe; isotope analyses; mobility of people; procurement of raw materials*

Introduction

Kleinhadersdorf is a small village at the western end of the town of Poysdorf in the north-east of Lower Austria, close to the Moravian border. Interestingly, there is a gap within the distribution of the LBK immediately north and east of the small settlement cluster to which this site belongs (Fig. 1). The first finds from the burial site were discovered in 1911. In 1931, Josef Bayer, and after his unexpected death, Viktor Lebzelter effected the first small-scale rescue excavations, digging out 21 graves in all (G1a/c – G19). The results were published quickly, but with only few details about the site (Lebzelter, Zimmermann 1936). No further investigation was done until 1987, when the 'Bundesdenkmalamt' in Vienna decided to start a

new rescue excavation in the central part of the area. The first campaign under the direction of Johannes-Wolfgang Neugebauer and Christine Neugebauer-Maresch clearly showed the necessity of further investigation, which was done in four more campaigns until 1991. An area of approx. 5000m² was uncovered and some 100 pits excavated (Verf. 1–90) (Neugebauer-Maresch 1992). In recent years, many analyses of the excavated material were completed. The results will be published in a monography of Kleinhadersdorf, which is currently being prepared for print (Neugebauer-Maresch, Lenneis in prep.). In this article, we present a short overview of some of the most important results of these analyses.

The burial pits

Some 67% of the burial pits at Kleinhadersdorf contained inhumations, while four pits (4%) contained traces of incinerations. The anthropologists identified the remains of 57 individuals (*Tiefenböck 2010*). As far as we can establish, these were all single burials, with two exceptions: a young woman buried with a newborn child (grave Verf. 5), and two small children of the same age. Radiocarbon dates were taken from the bones of 19 inhumations; the calibration of the data gives a time span between 5250–5020 calBC (*Stadler in prep.*).

The orientation is only known for 48 burials. More than half of the dead (55%) were oriented with the head towards south-east; another considerable percentage (19%) was buried with the head to the north-west direction, a few to the west (10%), east or north-east (6%), and to the north (4%). The impressive predominance of the south-east and north-west orientation is typical in other graveyards in eastern Central Europe (e.g., Těšetice-Kyjovice, Vedrovice, Nitra), but is slightly different in other regions of the LBK.

Bodies were placed in a more or less crouched position on the left side in 85% of the burials, and only in 15% of the burials on the right side. More than half of the bodies (65%) lay on their side with the hands before the face; in 32% of the burials the upper part of the body lay on the back, and prone in only a few cases (3%), while the legs are folded and placed to the side. The degree of bending of the legs is extremely varied, and seems to be due mainly to the form and extent of the grave pit.

The custom of spraying red chalk on bodies is a very old burial tradition in Central Europe, with varying importance within the LBK (*Lenneis 2007*). In Kleinhadersdorf, it was found on only nine individuals, placed around their heads. Some traces of red chalk/ochre on grind stones indicate the further use of this mineral, which can be found within the 'home range' (*Bakels 1978*) of the site (Fig. 2).

Twenty-six of the grave pits investigated between 1987 and 1991 had no inhumation, or only a few remnants, but they had precisely the same shape and size as the grave pits containing burials. The empty grave pits, presenting 29% of all graves at the site, and the amount of artefacts in them, seem to be

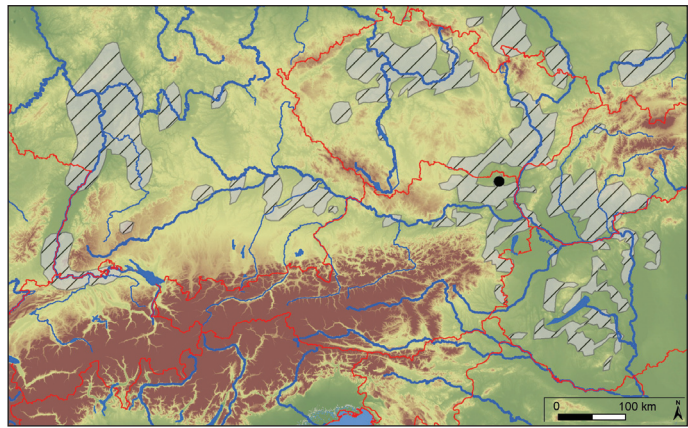


Fig. 1. The situation of the site Kleinhadersdorf within LBK distribution in eastern Central Europe (graph by J. Coolen).

a special feature of the Kleinhadersdorf graveyard as their number is quite high compared to other LBK sites (*Lenneis 2010a*). Nevertheless, these empty grave pits do not have the necessary characteristics of 'cenotaphs' – i.e. fully equipped graves of absent person as is the case in some other LBK graveyards.

The grave goods

When analysing the grave goods and their position inside the pits, we observed that in many cases empty space was available for some items which have clearly not been preserved. Therefore, we do not speak of 'rich' or 'poor' graves, but only of graves with many, some, few or no preserved grave goods. As we cannot estimate the value of the lost goods, we should not interpret the quantity of preserved goods as indicators of the social status of the deceased. Nevertheless, it was very interesting to compare the preserved situation of individuals of different sex and age with those in other LBK graveyards in a similar situation.

The position of the different grave goods in the pits clearly shows a preference for the area around the head, especially for pottery, but artefacts are common also around the upper body of the deceased. Only a few of the preserved grave goods were placed on or beside the folded legs. This phenomenon might be more due to the practical reason of lacking spare room inside the grave than a 'taboo' on placing items close to the legs; the area of the legs is more often used for the deposition of several gifts as can be observed in other LBK cemeteries.

The structure of grave goods and quantity of preserved objects vary considerably. As in most LBK graveyards, most males were equipped with the greatest

variety and quantities of preserved grave goods. The typical equipment of men at Kleinhadersdorf and other LBK sites consists of adzes, flint arrowheads and a rather large quantity and variability of pottery. The greater quantity of grinding plates and bone artefacts in male graves, compared to female and children's graves, seems to be a local phenomenon.

The preserved equipment in the 10 female graves shows less variety and lower quantities of different items. Four of them had no grave goods, which is in clear contrast to their provision with valuable ornaments. Women were much more richly supplied with durable goods in other LBK graveyards in Thuringia and Saxony for example. The quantity of children (including juveniles) of all individuals in Kleinhadersdorf is unusually high (18); ten of them were very young (*i.e.* infants 1 to 6 years old). The preserved equipment of the children burials, especially of infants, is more than the average for the LBK, with the proportion of children with adzes (55.5%) being the greatest from all known LBK burials.

Most of the grave goods consist of pottery, which is typical for LBK graveyards. Nevertheless, only 50% of the grave pits contained pottery. Typologically, the oldest vessels come from the transitional phase, *i.e.* from the oldest to the younger LBK in Austria (Lenneis 2010b). Most of the ceramic artefacts are decorated with the so-called music note style, and most pottery is very similar to Moravian vessels of the LBK IIa phase. Only rare vessels have elements typical of the Moravian phases LBK IIb and LBK IIc (Čížmář 2002), and these form the basis for identifying the second (LBK IIa) and third phases (LBK IIb+c) of the graveyard. Some vessels from the latest phase (Moravian phase LBK III) have decorations with features of the Šárka group and the Želiezovce group, indicating connections with Moravia and Bohemia, Slovakia, and Southern Poland.

Procurement of raw materials

The above-mentioned connections are even more impressive when we consider the procurement of raw materials at Kleinhadersdorf. Inna Mateiciucová (*in prep.*) did an extensive analysis of 25 chipped stone artefacts from the site, which show striking simi-



Fig. 2. Site territory and home range of people buried at Kleinhadersdorf (map Google Earth, graph E. Lenneis).

rities to the relevant objects from the Vedrovice cemetery. Most of the artefacts are made from Jurassic silicates from the Krakow-Czestochowa highlands (which presents a distance of 290km), some are made from Szentgál radiolarites (which is a distance of 190km), and others are cherts of Krumlovský Les in south-western Moravia (which presents a distance of 40–50km).

Different kinds of raw materials were used for the heavy tools of greenstone. The 20 adzes are all made of high-quality amphibolite (Fig. 3). Michael Götzinger (*Götzinger in prep.*) discovered that they might have originated from the Iser Mountains in northern Bohemia (approx. 360km from Kleinhadersdorf), where also adzes from the Vedrovice graveyards



Fig. 3. A selection of 20 adzes and two axes from Kleinhadersdorf (37/1 and 68/1) (photo by A. Schumacher).

might have been procured (Přichystal 2002). The most recent investigations in this region of northern Bohemia proved that amphibolite was procured at only one site for the entire LBK period, and this raw material had an extremely broad distribution in Germany (Ramminger, Šída 2012). Further analyses will have to be performed for the identification of quarries in the Iser Mountains where amphibolite was gathered for tools used at settlements in Moravia and Austria. All adzes found in graves had been used, and some of them show considerable wear (as much as 25% were already useless).

The axes were made of significantly different raw material. Their origin cannot be precisely determined at this point, but might be within the 'home range' (Fig. 2).

The high amount of grind stones (20) seems to be another special feature of the Kleinhadersdorf grave



Fig. 5. Kleinhadersdorf, burial 55 of an elder woman with a *Spondylus* necklace (photo of burial by J.-W. Neugebauer, BDA Vienna; photo of necklace by A. Schumacher).

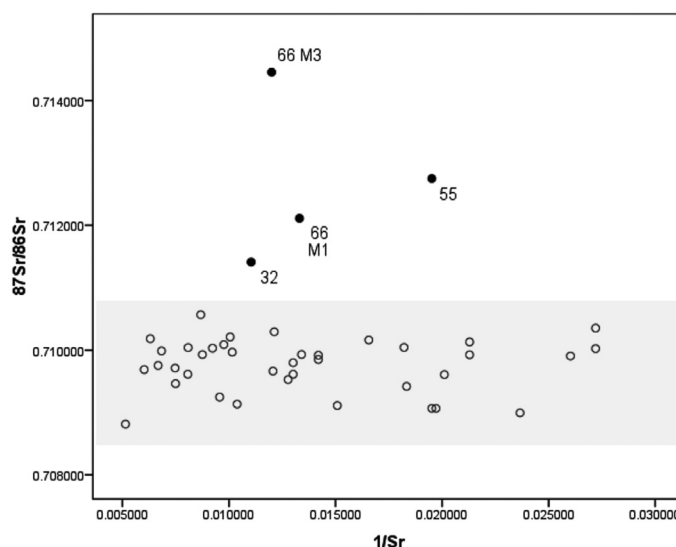


Fig. 4. The $^{87}\text{Sr}/^{86}\text{Sr}$ ratio plotted against $1/\text{Sr}$ ppm. The solid circles (with the according grave number) are the three Sr outliers (graph by P. Bickle; Bickle et al. in prep. Fig. 76).

site. Some are rather thin (2–3cm) and could not have served as 'millstones' for cereals; nevertheless, many fragments of quern stones, used for grinding cereals, were found. Most of the thin grinding plates are of local very fine-grained sandstone, but the fragments of the quern stones are made from a different high quality material. A few of them might have come from central Bohemia (Götzinger in prep).

Personal ornaments

Some 18 graves (or 33%) contained personal ornaments made from various materials. Head ornaments were identified in two children's graves. There was one pearl made from dentalium (grave Verf. 67–1) and 124 small shells of *Lithoglyphus naticoides* (grave Verf. 26). Special investigations by Mathias Harzhauser (Harzhauser et al. 2007) showed that these snail shells had been selected and the perforations made by careful grinding techniques; they were then probably sown onto a piece of clothing (e.g., a bonnet?). The evidence of these shell ornaments for an infant is most unusual within the LBK (Lenneis 2007).

Ornaments made of *Spondylus* shells are not abundant; 18.5% of all inhumations had at least one piece of this precious material. An adult woman (grave Verf. 55) and an infant (grave Verf. 22) had the only large necklaces made from *Spondylus gaederopus*, which most probably came from the Dalmatian coast on the Adriatic (Kalicz, Szénászký 2001; Sэфіradès 2000). This special jewellery was present in 40% of the female and in 30% of the children burials, but

only in 20% of the male burials. The rich adornment with personal ornaments for children at Kleinhadersdorf is as unusual as the low value of personal decoration for men.

Isotope analyses and mobility

The bones and teeth of 39 skeletons from Kleinhadersdorf were sampled for isotope analyses within the large international project at Cardiff University (Bickle, Whittle 2013) and 36 of the bone samples returned positive results. In general, the isotopic results from Kleinhadersdorf stress homogeneity, rather than structured difference. Despite a few interesting outliers, the majority of the population lived in the area throughout their lives and gathered their food nearby. The lack of identifiable differences between men and women, and across age groups, suggests that any social hierarchy or differences were not reflected in diet, and that access to certain types of food was not restricted for certain groups in the population.

The strontium results show a low level of mobility in comparison to other LBK cemeteries studied to date. Only three persons had $^{87}\text{Sr}/^{86}\text{Sr}$ ratios above 0.7111, which links their diet to a different geological background, *i.e.* on gneisses and granites, which are found in the Bavarian forest and the Bohemian Massif (Bickle et al. *in prep.*) (Fig. 4).

The archaeological evidence together with the results of the isotope analyses made it possible to reconstruct some individual life stories for the first time. The three ‘immigrants’ to the community that were buried at Kleinhadersdorf all came from a region north-west of the site and from a minimal distance of 50–60km.

The burial of a young adult of unknown sex was heavily destroyed (Fig. 4 – grave 66). The only remnant of his/her former grave goods was a fragment of a pot with ‘Notenkopf’ decoration. The different ratios measured in molars suggest that this individual died shortly after arrival at the site.

The older woman in grave ‘Verf. 55’ (Fig. 4 – grave 55) is from the founding generation of the graveyard, as indicated by the radiocarbon date taken from her bones. She was one of three individuals lying in a crouched position on her right side, and the only one with the upper body in a different position than the others. Her burial was oriented north-south, a position she shared with only one other per-



Fig. 6. Kleinhadersdorf, burial 32 of a young woman with a pot decorated in Šárka – style (photo of burial by J.-W. Neugebauer; photo of ceramic by A. Schumacher).

son, and she was equipped with one of the two big necklaces of *Spondylus* shells (Fig. 5).

The young woman in grave ‘Verf. 32’ (Fig. 4 – grave 32) is one of the last burials at the site, according to the radiocarbon dates. Her inhumation followed the most common ritual at the site, with a south-east orientation and a position crouched to the left, indicated by the last remains of her legs; however, the upper body was supine, with the hands crossed over her chest in a rather unusual position. The small remnant of a *Spondylus* shell at the pelvis may be the last trace of a belt decoration, which are well-known from other LBK sites. The only remaining grave good is a decorated pot, typical of the late LBK Šárka group, which corresponds with the young radiocarbon dates and supports the indication of her origin from the Bohemian massif (Fig. 6).

Fig. 7. Long-distance contacts of people buried in the LBK graveyard of Kleinhadersdorf as proven by Sr-isotopes and special goods: 1 adzes from the Iser Mountains, northern Bohemia – distance about 360km; 2 quern stones of a special sort of ‘Quarzsandstein’ from central Bohemia – distance about 230km; 3 silicates from the Krakow-Czestochowa highlands – distance about 280–290km; 4 chert of Krumlovsky Les, Moravia – distance approx. 40–50km; 5 radiolarite from Szentgál, Bakony Mountains, Hungary – distance about 190km; 6 Spondylus gaederopus shell, most probably from the Dalmatian coast on the Adriatic – minimum distance of 500–600km (map Google Earth, graph by E. Lenneis).

The $^{87}\text{Sr}/^{86}\text{Sr}$ ratios of these three individuals clearly indicate contact with north-western regions, where gneiss and granite form the main geological foundation, and from where also adzes and some of the quern stones were procured. On the other hand, flint raw material, pottery with typical North-East Hungarian/Slovakian Želiezovce group decoration and the *Spondylus* ornaments indicate contacts with other regions (Fig. 7). These contacts will be the subject of future research to clarify the connections over these impressive distances and the role that ‘immigrants’ played within these activities.



∴

References

- Bakels C. C. 1978. *Four Linearbandkeramik settlements and their environment: a paleoecological study of Sittard, Stein, Elsloo and Hienheim*. *Analecta Praehistorica Leidensia* XI. Springer. Leiden University Press. Leiden.
- Bickle P., Whittle A. (eds.) 2013. *The first farmers in Central Europe: diversity in LBK lifeways*. Oxbow Books. Oxford.
- Bickle P., Bentley R. A., Hedges R., Hofmann D., Hamilton J., Lainghas F., Nowell G., Pearson D. G. and Whittle A. in preparation. The Isotope Results from Kleinhadersdorf. In C. Neugebauer-Maresch, E. Lenneis (eds.), *Das linearbandkeramische Gräberfeld von Kleinhadersdorf*. Mitteilungen der Prähistorischen Kommission der Österreichischen Akademie der Wissenschaften.
- Čížmář Z. 2002. Keramik aus dem Gräberfeld in der Flur 'Široká u lesa'. In V. Podborský (ed.), *Dvě pohřebiště neolitického lidu s lineární keramikou ve Vedrovicích na Moravě*. Ústav archeologie a muzeologie, Filozofická fakulta Masarykovy univerzity. Brno: 151–190.
- Göttinger M. A. in preparation. Geologie und Rohstoffe. In C. Neugebauer-Maresch, E. Lenneis (eds.), *Das linearbandkeramische Gräberfeld von Kleinhadersdorf*. Mitteilungen der Prähistorischen Kommission der Österreichischen Akademie der Wissenschaften.
- Harzhauser M., Lenneis E. and Neugebauer-Maresch C. 2007. Freshwater gastropods as Neolithic adornment: size selectiveness and perforation morphology as a result of grinding techniques. *Annalen des Naturhistorischen Museums Wien* 109A: 73–85.
- Kalicz N., Szénászký J. G. 2001. Spondylus-Schmuck im Neolithikum des Komitats Békés, Südostungarn. *Prähistorische Zeitschrift* 76(1): 24–54.
- Lebzelter V., Zimmermann G. 1936. Neolithische Gräber aus Klein-Hadersdorf bei Poysdorf in Niederösterreich. *Mitteilungen der Anthropologischen Gesellschaft Wien* 66: 1–16.

Lenneis E. 2007. Mesolithic heritage in early Neolithic burial rituals and personal adornments. *Documenta Praehistorica* 34: 129–138.

2010a. Empty graves in LBK cemeteries – indications of special burial practises. *Documenta Praehistorica* 37: 161–166.

2010b. Zur Chronologie der älteren Linearbandkeramik in Österreich. In J. Šuteková, P. Pavúk, P. Kalábková and B. Kovár (eds.), *Panta Rhei. Studies on the Chronology and Cultural Development of South-Eastern and Central Europe in Earlier Prehistory. Presented to Juraj Pavúk on the occasion of his 75th Birthday*. Studia Archaeologica et Mediaevalia 11. Comenius University in Bratislava and Archaeological centre Olomouc. Bratislava: 189–200.

Mateiciucová I. in preparation. Die Silices im LBK-Gräberfeld von Kleinhadersdorf. In C. Neugebauer-Maresch, E. Lenneis (eds.), *Das linearbandkeramische Gräberfeld von Kleinhadersdorf*. Mitteilungen der Prähistorischen Kommission der Österreichischen Akademie der Wissenschaften.

Neugebauer-Maresch C. 1992. Der bandkeramische Friedhof von Kleinhadersdorf, NÖ. *Archäologie Österreichs* 3 (1): 5–11.

Neugebauer-Maresch C., Lenneis E. (eds.) in preparation. *Das linearbandkeramische Gräberfeld von Kleinhadersdorf*. Mitteilungen der Prähistorischen Kommission der Österreichischen Akademie der Wissenschaften.

Přichystal A. 2002. Petrographische Untersuchung geschliffener und übriger Steinindustrie aus den Vedrovicer Grä-

berfeldern. In V. Podborský (ed.), *Dvě pohřebišť neolitického lidu s lineární keramikou ve Vedrovicích na Moravě*. Ústav archeologie a muzeologie, Filozofická fakulta Masarykovy univerzity. Brno: 211–214.

Ramminger B., Šída P. 2012. Der bandkeramische Felsensteinabbauplatz Jistebsko, Kataster Jablonec nad Nisou, und sein regionales Siedlungsumfeld im mittleren Isertal, Tschechische Republik. In R. Smolnik (ed.), *Siedlungsstruktur und Kulturwandel in der Bandkeramik, Beiträge der internationalen Tagung "Neue Fragen zur Bandkeramik oder alles beim Alten?"*. Leipzig 23.–24.09.2010. Arbeits- und Forschungsberichte zur sächsischen Bodendenkmalpflege 25. Dresden: 67–179.

Séfiériadés M. L. 2000. Spondylus Gaederopus: Some Observations on the Earliest European Long Distance Exchange System. In S. Hiller, V. Nikolov (eds.), *Karanovo Band III. Beiträge zum Neolithikum in Südosteuropa*. Phoibos Verlag. Wien: 423–437.

Stadler P. in preparation. Versuch einer Auswertung mittels Bayes'scher Statistik der ¹⁴C-Proben von Kleinhadersdorf. In C. Neugebauer-Maresch, E. Lenneis (eds.), *Das linearbandkeramische Gräberfeld von Kleinhadersdorf*. Mitteilungen der Prähistorischen Kommission der Österreichischen Akademie der Wissenschaften.

Tiefenböck B. 2010. *Die krankhaften Veränderungen an den linearbandkeramischen Skelettresten von Kleinhadersdorf, NÖ – ein anthropologischer Beitrag zur Rekonstruktion der Lebensbedingungen im Frühneolithikum*. Unpublished Master thesis. University of Vienna. Vienna.