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"CHILDREN AS PLANTS." ANALYSES OF SKELETAL REMAINS OF SUSPECTED CHILDREN SACRIFICES ON A NEOLITHIC SETTLEMENT IN VEDROVICE, CZECH REPUBLIC

ABSTRACT: *Vladimír Ondruš (1972) referred to numerous instances of children's burials at the Neolithic settlement in Vedrovice in South Moravia, Czech Republic. He based his explanation of these occurrences on the theory that children had been subjected to ritual sacrifice during the process of laying the foundation or completion of a house. Elevated values of strontium isotopes ($^{87}\text{Sr}/^{86}\text{Sr} > 0.7115$) in M1 tooth enamel and a compact bone segment of the central femur of the three juvenile individuals suggest that these children (grave H3/66, 6-7 years; grave H4/69, 7-8 years; grave H5/71, 5-6 years) were migrants. The Vedrovice area is located close to the NE-SW trending boundary between the Bohemian Massif crystalline region, dominated by Palaeozoic or older granitoids and metamorphic rocks with generally high $^{87}\text{Sr}/^{86}\text{Sr}$ to the NW, and lowland areas to the SE, dominated by Cenozoic marine sediments with low $^{87}\text{Sr}/^{86}\text{Sr}$ ratio. It is thus more probable that the 3 children in question originated from the NW region. Children in graves H3/66, H4/69, and H5/71 from the Neolithic site in Vedrovice were placed behind posthole huts, on their western side. The graves of H3/66 and H4/69 contained no gifts, and all were non-locals, likely born northwest of Vedrovice. One of them had the arms in front of the face as if in fear. Hence it may be concluded and to speculate that these children were migrants, and were killed (or buried alive) during the founding of a field in a religious ceremony to support the growth of crops.*

Analyses of migration on the site as well as ethnographical comparisons with other primitive agricultural societies from the Amazon, New Guinea and India which have traditions of comparing children to plant growth, suggest that the children were most likely sacrificed during the process of founding a field as part of a ritual ceremony to support the growth of crops. Perimortem traumas on the skulls of two children from the triple burial 48-49-50/65 Nitra-Horné Krškany (Slovakia) are evidence of potential violence. We can only speculate whether the children in both sites, Vedrovice and Nitra, were victims of ritualistic behaviour among the Neolithic farmers.

KEY WORDS: *Neolithic farmers – Potential violence – Children victims*

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INTRODUCTION

Isotopic investigation proved to be powerful tool since its introduction to archaeological research in 1960s (e.g. Brill, Wampler 1967). Isotope archaeology developed in parallel with the development of analytical facilities, benefiting largely from interdisciplinary cooperation with medicine, biology, geology, metallurgy and other natural sciences. To mention just the most prominent applications: hydrogen, carbon and oxygen isotopes are used for palaeoecology and palaeoclimatology reconstructions; carbon and nitrogen isotopes from human tissues serve as diet proxy; strontium, lead or oxygen help to reconstruct migration paths of people and animals (Pollard 1998).

Strontium isotopes in skeletal tissues have been utilised for migration studies since the landmark paper of Ericson (1985). Unlike lighter elements, isotopic variation of the $^{87}\text{Sr}/^{86}\text{Sr}$ ratio is not influenced by low temperature kinetic fractionation effects. The ^{87}Sr is produced solely by radioactive decay of ^{87}Rb . The only controls of the $^{87}\text{Sr}/^{86}\text{Sr}$ isotopic value within natural reservoirs are therefore the Rb/Sr ratio and age, as well as mixing of such pools (Faure 1986). The Sr is conveyed from the rock environment through food chain into the human body, its composition thus reflects the bioavailable Sr in the local soil and rock environment (Price *et al.* 2002, Montgomery 2010).

In the human body, Sr deposits primarily in the skeleton, as it mimics chemically similar calcium. It was shown that Sr isotopic composition of tooth enamel in combination with dentine or bone tissue reflects juvenile and adult diet, respectively (Price *et al.* 2002, 2004). Enamel of all teeth, with the exclusion of the third molar, is formed before the 8th year (Ash, Nelson 2003) and is not renewed, whereas bone tissue is renewed during the entire life (Price *et al.* 2002, Montgomery 2010). Hence, if tooth enamel and compact bone have different values of strontium isotope ratios, it may be assumed that the examined person spent the early and pre-death years in different geochemical environments (Hillson 1997). Tooth enamel is also significantly more resistant to post-mortem chemical alterations, providing the consensus that enamel data is more robust (Koch *et al.* 1997, Price *et al.* 2002).

The key issue is to ascertain the strontium isotope ratio typical for the local population. The $^{87}\text{Sr}/^{86}\text{Sr}$ isotope ratio in tissue reflects the isotope structure of local water sources for which rock subsoil was the dominant source of strontium. However, since the

majority of rocks are composed of several minerals with different isotope structures – and they also weather and release the elements into water at varying rates – in most cases the information on bulk rock isotopic composition cannot be directly used to ascertain mobility. Owing to the variability of hydrological and hydrogeological conditions, it is also problematic to analyse water sources directly. The best indicators of local isotopic signal therefore appear to be skeletons of small rodents or domestic animals, in particular pigs, which are close to humans in the trophic chain (Bentley 2013, Bentley, Knipper 2005, Montgomery 2010). Some authors also rely on statistical evaluation of enamel composition of juvenile individuals, supposing little mobility of children (Price *et al.* 2002).

In this study we present the data and conclusions for strontium isotopes applied to set of skeletons from the Neolithic site in Vedrovice, Czech Republic. The primary goal was to contribute to understanding of possible migration patterns in the Southern Moravia. We also propose some social hypotheses, with evidence for ritualistic human sacrifice (Watts *et al.* 2016) found throughout the archaeological record of early civilisations (Bremmer 2007) which fits well into the mosaic of our current knowledge of the site.

The Site

The Neolithic settlement and the cemetery in Vedrovice is located in South Moravia in the south-eastern part of the Czech Republic, nearby the town of Moravský Krumlov (Ondruš 2002).

Between 1961 and 1974, Ondruš (1961–1974), the excavations supervisor, investigated 11 burials in a track named "Široká u lesa" at a Linear Pottery Culture (LBK) settlement. All burials date back to stage IIa of the LBK Culture (Tichý 1962). Animal skeletal remains (a pig, sample no. 642–643) discovered on the site put the radiocarbon age as 5990 BC \pm 133.

Graves H1/63 - H11/74 were located inside the area enclosed by a ditch ("Erdwerk"); to the north of this densely populated site, there was already a standard cemetery used for normal burials since stage Ib₁ of the LBK Culture (Podborský 2002).

Besides typical pious burials, separate grave pits (grave H4/69, grave H7/72, and grave H10/74), a settlement pit (grave H1/63) or a construction pit (grave H5/71) and anthropophagic signatures (grave H11/74) on remains were also recorded. A ritual position of the skeleton was ascertained in graves H2/63, H3/66 and H6/72. However, the grave pits were

not identified as these burials had been performed at loess subsoil level. In the aforementioned list of burials, children predominated. Such burials in separate grave pits, settlement pits, construction pits or non-standard positions are common to settlements of the LBK people e.g. in Mikulov (Unger 1974) or Žádovice (Čižmář, Geislerová, 1997).

Sample processing

Paired bone and tooth enamel samples were taken from graves to determine the strontium isotope ratio and prepared roughly according the approach of Price *et al.* (2000). Samples were mechanically cleaned, leached in dilute acetic acid and DI water using ultrasonic bath, and ashed in a muffle furnace. Following this, samples were dissolved in concentrated ultrapure HCl and the strontium was separated by cation exchange chromatography.

The $^{87}\text{Sr}/^{86}\text{Sr}$ ratio was determined using Finnigan MAT 262 thermal ionization mass spectrometer in static mode, double Re filament arrangement. The mass bias was corrected by means of normalization on the assumed $^{88}\text{Sr}/^{86}\text{Sr}$ ratio = 8.375209. External reproducibility was checked by repeated measuring the $^{87}\text{Sr}/^{86}\text{Sr}$ isotope ratio of the NIST SRM987 reference material (Wise, Watters 2007), where the mean value was 0.710252, $\pm 0.000022(2\sigma)$.

Vladimír Ondruš (1972) pointed at numerous occurrences of child burials on this site and hypothesised that children were ritualistically sacrificed during the founding process or following the completion of a house. The objective of this research was to ascertain whether the buried children were locals or from other areas, and to specify the archaeological description of skeletons and their equipment.

MATERIAL

Human skeletons: From skeletons in graves H1/63 (a child, 6–8 months), H2/63 (a child, 5–6 years), H2/85 (a male, 25–30 years), H3/66 (a child, 6–7 years), H4/69 (a child, 7–8 years), H5/71 (a child, 5–6 years), H6/72 (a child, 3–4 years), H7/72 (a new-born), H8/74 (a new-born), H9/74 (a female, 50–60 years), H10/74 (a male, 40–50 years, and H11/74 (a male, 35–40 years) from the Vedrovice site, deposited in the Anthropos Institute, Brno, CZ. The ages were determined by Marta Dočkalová (Dočkalová, Čižmář 2007) from the Anthropos Institute of Moravian Museum.

Methodology

Samples were taken from six individuals (H2/85, H3/66, H4/69, H5/71, H10/74, and H11/74) in an attempt to distinguish locals from migrants. To separate the migrants, the ratio between ^{87}Sr and ^{86}Sr isotopes collected from M1 tooth enamel and the compact bone segment of from the shaft of the right femur were used.

RESULTS

Ascertaining mobility: Skeletons from grave H3/66 (a child, 6–7 years) and grave H4/69 (a child, 7–8 years) yielded a high $^{87}\text{Sr}/^{86}\text{Sr}$ ratio in tooth enamel against bone of the femur. For comparison, one sample of a pig's jaw as a possible proxy of the local biologically available isotope ratio (0.71097; *Figure 1*).

Subjects from graves H5/71 (a child, 5–6 years) and H10/74 (a male, 40–50 years) had a high femur $^{87}\text{Sr}/^{86}\text{Sr}$

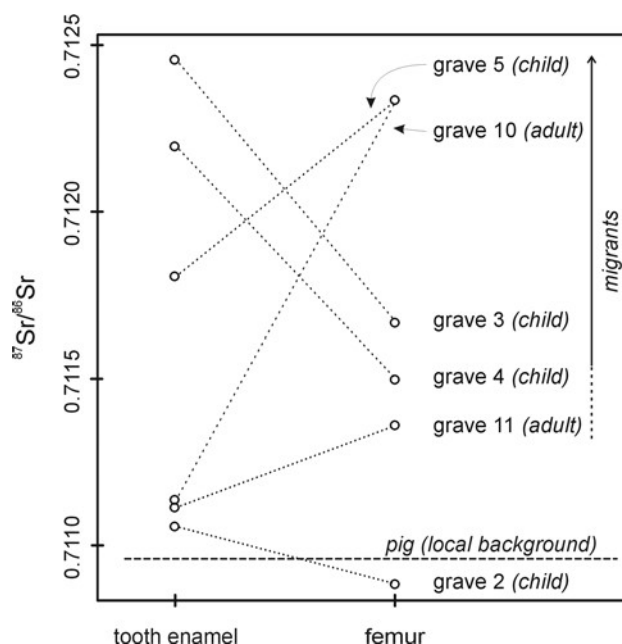


FIGURE 1: $^{87}\text{Sr}/^{86}\text{Sr}$ in tooth enamel and compact bone in skeletons of children in graves H2/85, H3/66, H4/69 and H5/71 and in adult males in graves H10/74 and H11/74 on the Vedrovice site (a domestic pig – *sus scrofa f. domestica* – was an indicator of local biologically available strontium). Grey field represents the local signal of Richards *et al.* (2008), grey dots data from Richards *et al.* (2008) and Bickle *et al.* (2014); horizontal jitter was artificially added to the literature data for better readability.

^{86}Sr ratio against M1 enamel pointing to the probability that the child and the male subject migrated more than once.

On the contrary, in skeletons from graves H2/85 (a male, 25–35 years) and H11/74 (a male, 35–45 years) the isotope ratio for both the enamel and the femur were very close, which does not suggest distinct migration.

Archaeological description of children (Dočkalová, Čížmář 2007) – migrants in graves H3/66, H4/69 and H5/71 (Figure 2).

Grave H3/66

Burial was performed on the dividing line between subsoil and topsoil (0.50 m in thickness) and the grave was located on an area with the archaeological features, near the western edge of feature O55. The child's skeleton (6–7 years) is in a contracted position on the left hip. The skeleton is west (head)-east (legs) oriented. Arms are distinctly bent at the elbow with palms to face. The left leg is distinctly bent at the knee joint in front of the chest and the right leg is bent to full and vertical to the body axis. The grave yielded no gifts, only two pieces of flake industry were found in the infill.

Grave H4/69

The grave is located above the construction pit O38 and a trench of the construction complex D3, in a separate grave pit of dimensions 0.70 m × 0.35 m and is NW-SE oriented. The child's skeleton (7–8 years) is in a distinctly contracted position on the right hip and southeast (head)-northwest (legs) oriented, facing north. On the southern side, there is indication of post burial subsoil rearrangement. The right arm is in maximum contraction with the palm below the head. The left arm is slightly contracted with the palm below the elbow of the right arm. The thorax and vertebrae are relatively preserved. The legs lay parallel, drawn to maximum with the knees to the chest; feet at pelvis. The grave yielded no gifts either.

Grave H5/71

At the western edge of the southern part of feature O89 (construction pit) there was a layer of dust. A hole was dug into the bottom of the feature with a regular oval layout and tub profile, with a north-south orientation and dimensions 0.70 m × 0.50 m. On its bottom lay a skeleton of a child on its right side, NW (head)-SE (legs) oriented, facing northwest. The skull was unnaturally bent backwards and deviated from the

body axis remarkably. The spine was slightly bent, of the arms only the left humerus was found *in situ*; the remaining components were missing. Several phalanges were found below the chin. The upper part of the body lay prone with the legs lying on the right

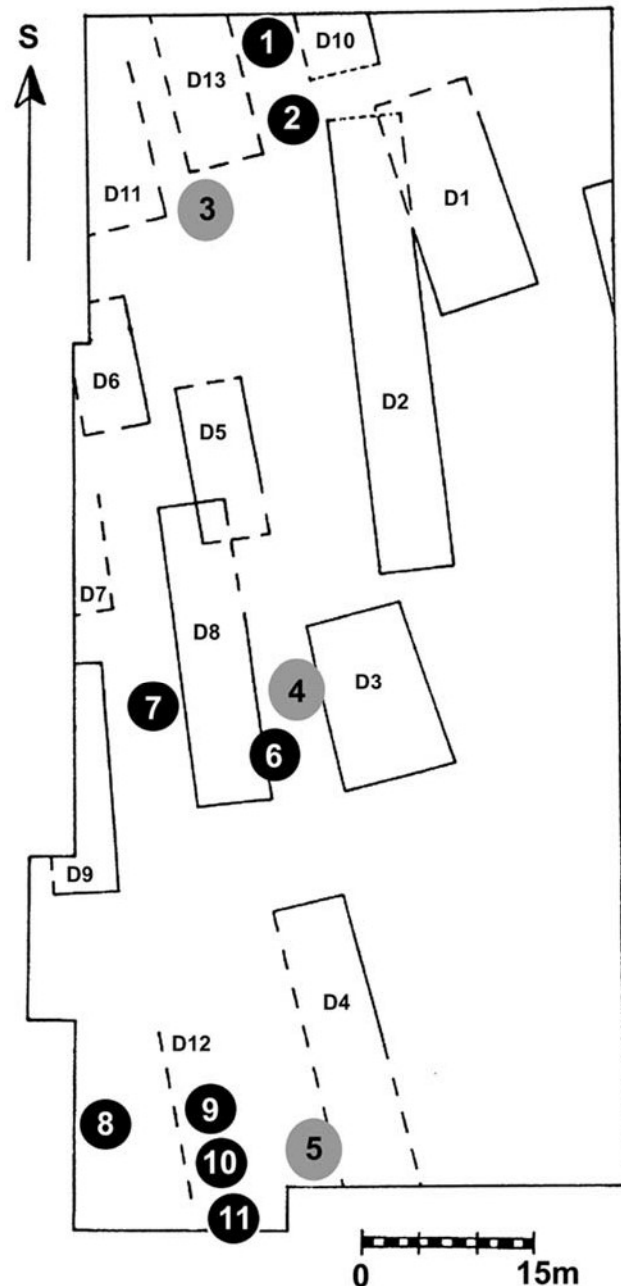


FIGURE 2: The distribution of burials and houses at area of settlement Vedrovice. Grey circles 3, 4 and 5 are non-locals.

hip. The legs were not examined *in situ*, but their position could be reconstructed from imprints on the grave bottom – in parallel contraction and sharp angle of the femurs, vertical to the body axis. It was the only grave to have yielded goods which may be considered as gifts due to the setting of the find. The skull lay on the right temple on a flat triangular rubber. A flint flake was found at the eastern edge of the grave pit, approx. 0.15 m from the shoulder blade and 0.03 m above the bottom. A small vase-like vessel with bosses on the circumference of its maximum convexity was laid askew at the western part of the grave, below the humerus. Next to it – directly in the wall of the grave pit – a pebble stone was laid. The grave pit infill yielded 12 pieces of flake industry. Due to its goods, this grave belongs to the best-equipped burials within the enclosed settlement, but it does not differ from the funeral custom generally applied at the Vedrovice cemetery.

Of all the examined burials, only graves H1/63 (a fragment of a ceramic vessel), H2/63 (a bone awl), H5/71 and H10/74 (a shoe-last celt) contained gifts.

Subjects in graves H3/66, H4/69 and H5/71 were laid in a pious position. Similar to other burials, they were placed at the western wall of the layout of an above-ground post structure and did not respect unity in placing (e.g. in a construction pit or a settlement feature) and orientation. H3/66 and H4/69 were separated by 40.80 m, H4/69 and H5/71 by 41.60 m; they generally observed a NE-SW axis.

Burials of migrants were located in the construction and communication space of houses D3, D4 and D13. Construction elements of house D3 (trench or postholes) yielded fragments of pottery, which dated the house back to the earlier stage of the LBK Culture. Houses D4 and D13 can also be dated to this period, despite the fact that the stratigraphic situation was less clear as the earlier LBK settlement was superposed with more intensive settlement of stage IIa. The features, which can be considered as construction pits of these houses, contained a higher amount of pottery fragments dating back to the earlier stage of the LBK Culture.

DISCUSSION

For the migration study, it is critical to establish the local isotopic signal. As in other places, the LBK settlement in Vedrovice is based on loess soil (Upper Pleistocene, Adamova *et al.* 1995, Bickle *et al.* 2014).

Although the bulk loess $^{87}\text{Sr}/^{86}\text{Sr}$ composition is influenced by the average regional geology in accordance with its periglacial aeolian siliciclastic origin (Frechen 2011), the bioavailable carbonatic Sr-rich cement is dominated by seawater $^{87}\text{Sr}/^{86}\text{Sr}$ even in localities distant from the seashore (Gallet *et al.* 1996). This supports estimate of Bickle *et al.* (2014), that Vedrovice's locally bioavailable $^{87}\text{Sr}/^{86}\text{Sr}$ is in the range 0.7105–0.7108, although the diet composition may also be influenced by the fingerprint of adjacent areas as discussed later. An independent control is provided by an analysis of a domestic pig tooth enamel value ~ 0.7110 , which is considered to be a proxy of prevailing local diet. Another approach is to evaluate available local enamel Sr data with an assumption (supported by archaeological evidence), that majority of the population is local and migrating individuals represent statistical outliers. Such consideration led Richards *et al.* (2008) to the estimate that values between 0.7108 and 0.7115 are local. Bickle *et al.* (2014) proposed a larger range 0.7105 to 0.7120, taking into account larger dataset available. However, the authors do not discuss the 'higher' migrants in detail. Based on these ranges we suppose the individuals from graves H3/66 ($^{87}\text{Sr}/^{86}\text{Sr} \sim 0.7125$) and H4/69 ($^{87}\text{Sr}/^{86}\text{Sr} \sim 0.7122$) are migrants, and very probably H5/71 ($^{87}\text{Sr}/^{86}\text{Sr} \sim 0.7118$) too.

Although the bioavailable Sr does not directly mirror the composition of the rock and soil background, it is the ultimate Sr source and geology thus sets the general limits for migration considerations (e.g. Montgomery 2010). A glimpse into the geological map (e.g. Cháb *et al.* 2007) reveals that the Vedrovice site is situated at the SE margin of the Bohemian massif (BM). This mostly upland area is a melange of Paleozoic or even older rocks, dominated by granitoid and metasedimentary rocks (Cháb *et al.* 2010). As most of the BM rocks have relatively high Rb/Sr values and are older than 300 millions of years, the time-integrated $^{87}\text{Sr}/^{86}\text{Sr}$ is higher than 0.712 due to Rb radioactive decay. On the contrary, the subsoil of the lowland areas SE of the BM (Vienna Basin) is formed mostly by Neogene marine sediments with $^{87}\text{Sr}/^{86}\text{Sr}$ below 0.709 (De Paolo, Ingram 1985, Veizer *et al.* 1999).

Therefore, it is probable that children in graves H3/66, H4/69 and H5/71, and an adult male from grave H10/74 of the Neolithic Vedrovice site were not from local the population, but from elsewhere. As the measured isotope ratios exceeded 0.7115, it may be assumed that these individuals did not come from the

territory of the Vienna Basin, stretching southeast of Vedrovice. Some 67% of the analysed remains from the Vedrovice site showed evidence of migration (out of 6 analysed skeletons 4 were migrants, i.e. 3 children and 1 male).

Reconstruction of migration in Neolithic settlements suggest a 65% migration, in e.g. Dillingen (Bentley *et al.* 2002, Goldberg *et al.* 2016), and particularly with women. The mobility of children was also proven with the Bell Beaker people in grave 1 at Straubing (Grupe *et al.* 1997). In the Neolithic Vedrovice settlement, migration was 67%.

Current ethnographical records of primitive agricultural societies from various parts of the world – from the Amazon or New Guinea (Descola 1994, Strathern 1980) – point at a tradition of comparing children to the cultivation of plants: the Achuar people of the upper Amazon grow primarily manioc in their gardens, and the mothers have a similar nurturing relationship with their children at home as they do to plants in the gardens (Descola 1994), while the people of Mount Hagen (Papuan people) from New Guinea believe that children, like plants, require a 'fertile soil' within their environment to mature to adulthood (Strathern 1980).

Even as late as 1902, the Ganjam authorities in India were asked to give permission for ritual execution of humans for sacrifice. The last case is said to have occurred in 1932, where the sadhu (fakir) in Aligarh secretly sacrificed his pupil. Human sacrifices (meriah) were a frequented feature in India. The sacrificed person had to be in the possession of the sacrificing community – he/she could be neither captured nor "stolen" from other communities. For this purpose, the sacrifice was usually bought directly from the parents in early youth. This fact was also explicitly communicated to the gods during the sacrificial ceremony. Afterwards, every participant in the ritual tried to take quickly takes the still warm pieces of the sacrifice to their fields. In the first half of the 1900s, people in villages were still mentioning that their saffron fields had not been yielding as good harvests since they had stopped sprinkling them with human blood. It is obvious that this tradition did not fade away entirely from folk consciousness and human sacrifice was replaced by a puppet or an animal dressed in male or female clothes according to the requirements of the ritual (Hemneter 1937).

Violence among the first farmers is illustrated by cranial trauma in two children of the Neolithic population from Nitra-Horné Krškany (Slovakia).

In the triple burial 48–49–50/65, there were two children (4–5 years) both of whom had peri-mortem cranial trauma, and a young female (20–24 years). The female was very gracile, and with an estimated stature of 144.0 cm she was the smallest individual found in Nitra cemetery. The author (Tvrdý 2016) speculates whether they were victims of inter or intra population violence, or ritualistic behaviour.

On the Vedrovice site, the graves of children H3/66, H4/69 and H5/71 were not placed below houses – as would be assumed from Ondruš's hypothesis – but outside the house, in a partially filled pit on the western side of posthole hut structures where fields could have been. Children in graves H3/66 and H4/69 had no gifts, they were migrants and around 7 years of age. Further, the body position of H3/66, whose hands were positioned to cover the face, potentially out of fear, help to support our hypothesis this child was a sacrificial victim. Ondruš's hypothesis, when viewed in this context, culminates in the assumption that these children could have been ritually sacrificed during founding of a field to support plantation – cereals.

CONCLUSION

Children in graves H3/66, H4/69, and H5/71 from the Neolithic site in Vedrovice were placed behind posthole huts, on their western side. The graves of H3/66 and H4/69 contained no gifts, and all were non-locals, likely born northwest of Vedrovice due to the differences in Sr isotopes. One of them had the arms in front of the face as if in fear. Hence it may be surmised that these children were migrants, and were killed (or buried alive) during the founding of a field in a religious ceremony to support the growth of crops. Perimortem traumas on the skulls of two children from triple burial 48–49–50/65 Nitra-Horné Krškany (Slovakia) are further evidence of violence. Thus, we can only speculate as to if the children, in both sites, Vedrovice and Nitra, were victims of ritualistic behaviour among the Neolithic farmers.

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