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Strontium Isotope Analysis at an 18th Century Burial Ground in Semonice (Czech Republic) – the Use of Modern Skeletal Remains and its Narrative and Interpretative Value

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A B S T R A C T

The paper is devoted to the application of strontium isotope analysis to investigate samples from an 18th century burial ground in Semonice, northeastern Bohemia. The circumstances of the burial ground's origins as well as the origins of the deceased could not unambiguously be determined with the help of archaeological and anthropological methods. However, the results of isotope analysis helped to answer both questions. When these are supplemented with the testimony of written sources, it is even possible to specify the time of the burial ground's establishment.

1. Introduction

The use of strontium isotope ratio analysis has been a well-established method (Bentley *et al.*, 2002; 2003; Wang *et al.*, 2016). However, for the modern period (17th–19th centuries), its use is rather uncommon. Written sources (*e.g.* parish registers) usually enable the origins of the deceased to be investigated through historical research. Based on written sources, it is at least possible to determine the historical event in which the burial site was established (Čechura 2010, p.117; Omelka and Řebounová, 2017, pp.127–128). In between 2017 and 2019, an archaeological excavation was carried out in the village of Semonice near the town of Jaroměř in northeastern Bohemia. The excavation was triggered by the construction of the D11 highway. During the excavation project numerous modern situations were investigated, in addition to other components. These included a burial ground and an adjacent military camp (Figure 1). Archaeological and historical approaches are unfortunately unable to determine whether the buried individuals were residents of the camp or members of the local rural community. Furthermore, assuming that these were encamped troops, it is not possible to determine which army, in the context of the 18th-century Austro-Prussian wars, was involved. The aim of this paper is to exploit the potential of the method of strontium isotope ratio analysis when analysing modern skeletal material. As far as is known, strontium isotope ratio analysis has been applied to this type of site (a burial ground adjacent to a military camp) in a European context for the very first time.

1.1 Archaeological background

The burial ground consisted of a group of 33 grave-pits located in an atypical position – outside the regular graveyard. The grave-pits were arranged in two rows. The individual

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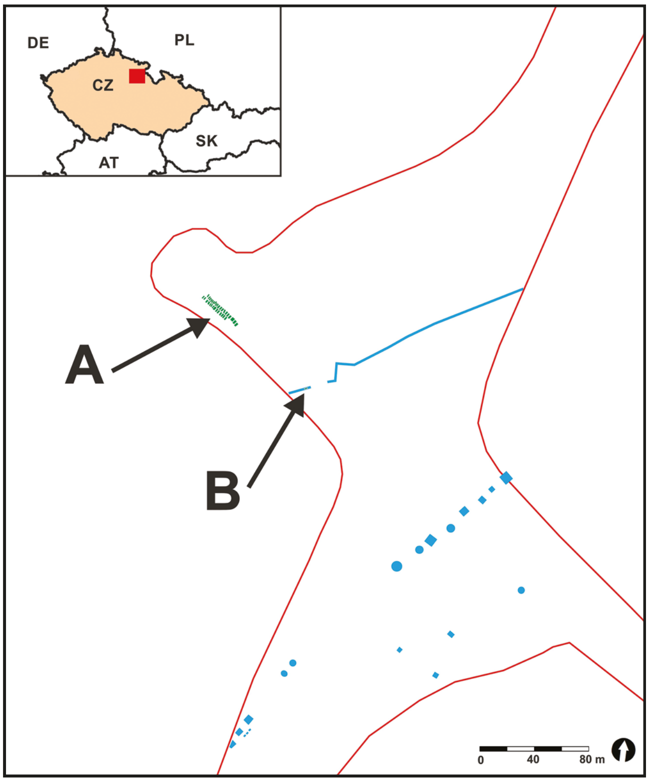

Figure 1. Site's location within the Czech Republic. The area of archaeological excavation is marked in red. The location of the burial ground is marked in green (A). Features within the military camp are marked in blue. At location B, a burial was found in the camp's ditch (feature 2A-67).

pits respected each other and there were no superpositions. The grave pits' ground plans were approximately rectangular with rounded corners (Figures 2 and 3). The composition of the graves in terms of the number of buried individuals is non-standard for the period in question. Only 12 graves contained one individual, while the remaining 21 graves (63.7%) contained two or more individuals (one with five individuals, one with four individuals, seven with three individuals, twelve with two individuals).

Other excavated situations from the early modern period were interpreted as being part of a military camp. In particular, there is a group of 24 features, for the majority of which a burnt central area (fireplace) and a simple, linear arrangement are characteristic. This series of features with a burnt centre can be interpreted as field kitchens, while the linear feature would then represent a remnant of the camp's fortifications, *i.e.* a ditch (Drnovský, *et al.*, 2021).

Another component of the military camp was a linear feature which was almost 190 metres long and situated parallel to the above features. Human remains (2A-67) in an anatomical position on the back were discovered at the ditch's bottom. A lead projectile was recovered from the right thoracic region. As neither the ribs nor the sternum have been preserved in these places, we do not possess any physical evidence that the body was shot through. However, this is very likely as the projectile bore evidence of having been deformed by impact (Figure 4).

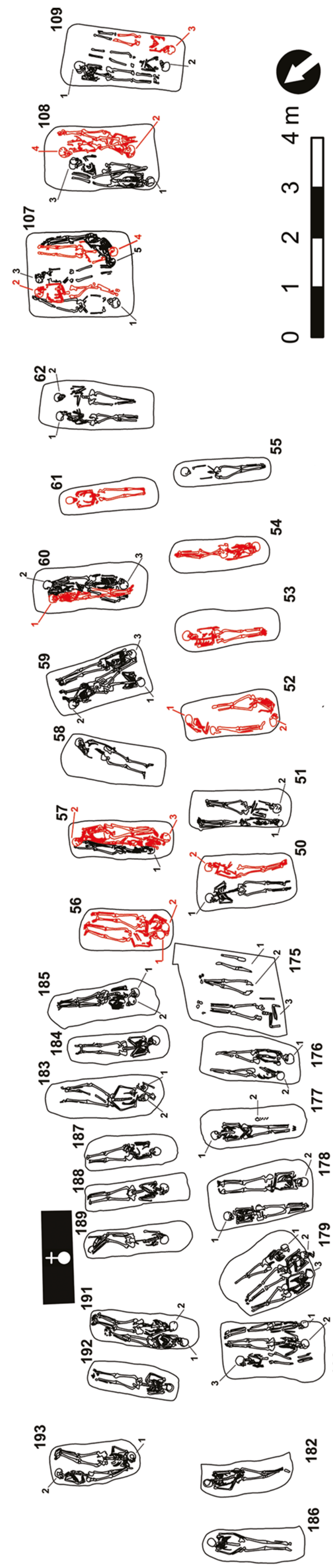

Figure 2. Semonice, Bohemia. Plan of the burial ground. The analysed individuals are highlighted in red.

Figure 3. Semonice, Bohemia. Documentation of burials. The analysed individuals are highlighted in red.

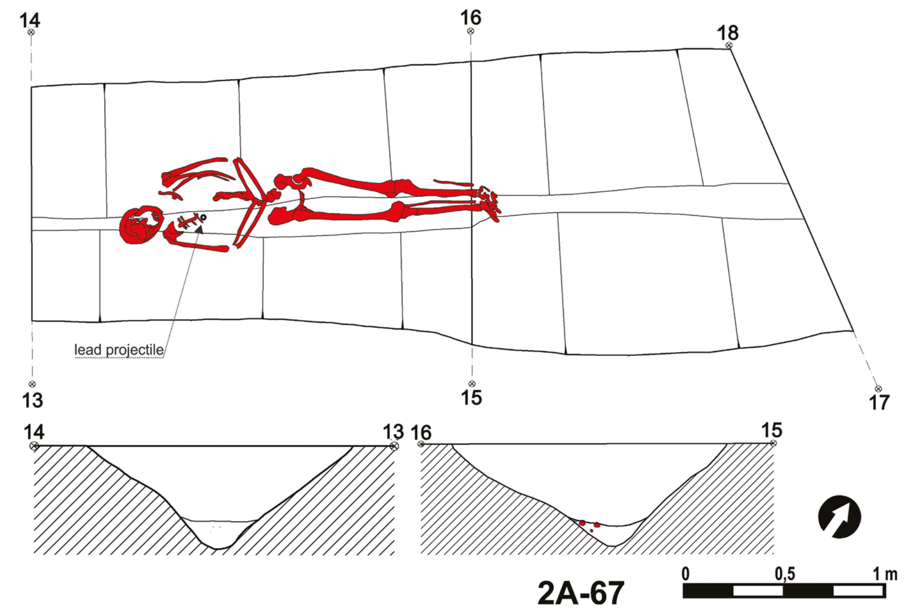

Figure 4. Semonice, Bohemia. Documentation of the burial of individual 2A-67.

Archaeological findings from all these situations (the burial ground and the features within the military camp) allow to chronologically determine the site as dating from the 18th century. Archival documents prove that there were military encampments in the vicinity of Semonice during the Austro-Prussian wars. In 1745, the Prussian army under the command of King Frederick II was encamped there, and throughout the following years, there were several encampments of the Habsburg army. The troops of Field Marshal Leopold Daun were encamped there in 1758 and the army of Prince Casimir of Saxe-Teschen lodged there in 1778. However, based on the archaeological record, it is not possible to determine which specific historical event this camp was associated with.

The origins of the investigated burial ground can be linked to the troops encamped nearby and, generally speaking, there are two interpretive possibilities. Either the camp's inhabitants (soldiers and their accompaniment) or the local rural population could have been interred there. In the former case, the burials would belong to soldiers and their entourage who died of unspecified illnesses in a field hospital, *i.e.* not as a result of lethal injuries. In the latter case, it would have been a makeshift burial ground used by the local population in times when the capacity of ordinary graveyards in the vicinity was insufficient due to increased mortality. Analysis of civil registration records reveals that the several-fold increase in mortality during the 18th century was related to the presence of encamped troops, who, in addition to contaminating water sources and eating up food supplies, also brought infectious diseases with them (Drnovský and Průchová, 2021, pp.419–421; Drnovský *et al.*, 2021).

1.2 Archaeothanatology

The form of disposal of the bodies of the dead gives us a picture of society, but also of the relationship of people to the dead. The funeral rite at this site was based on Christian standards, but there are many deviations. The standard and common Christian burial in 17th–19th century in Europe is the deposition of a single individual in the grave-pit in the supine position (Unger, 2006, 59–67). The burial ground consisted of 33 graves, in which a total of 66 individuals were buried. In addition to them, one more individual was found from a ditch (2A-67) near a military camp. Taphonomic analysis with subsequent reconstruction of the burial rite was based on Duday's methods (Duday *et al.*, 1990; Duday, 2005; 2009). In all cases recorded within the burial ground, these were primary burials, where individuals were buried at their final resting place shortly after death. Based on positions in which the remains were located, three groups of burials could be distinguished. The first group was characterised by the reverence of the burial and a high degree of adherence to the standards of the Christian funerary rite. Thirty-nine individuals (59.1%) from both single and multiple graves would fall into this category. The second group was characterised by non-reverence which was mostly caused by an atypical placement of the remains (*e.g.* lying prone or on the side, or placement next to the pit wall). Twenty-two individuals (33.3%) were included in this group. The third category was defined as likely additional burials. These included four individuals (6.1%) from multiple graves in which the other individuals seemed to respect each other. The four overlapped them as if they had been additionally thrown into an already preprepared and filled-in pit. Escalated circumstances (wars, epidemics, *etc.*) and lack of time very often lead to the degradation of funeral rituals (Hutchinson and Mitchem, 2001, p.61).

Age at death, especially in the case of adults, is a rather complex parameter, due to the fact that many both external and internal factors are involved in the process of aging. Every skeleton "ages" slightly differently and an estimate is then burdened with a certain degree of variability (White *et al.*, 2012). For individuals whose skeletons were still developing (the juvenis category), the method of Ferembach *et al.*, 1980 (supplemented by the findings of Scheuer and Black, 2000) was used. In adults, the age at death was estimated using the following methods. With regard to the degree of preservation of the osteological material, the most commonly used method was the tooth attrition rate according to Lovejoy (1985). The limiting factors of this method are the influence of genetic predisposition and the nature of the diet consumed. In cases when pelvic bones have survived intact, the estimation of age at death was preferably done based on *facies auricularis* (method of Bucberry and Chamberlain, 2002) or changes in the *acetabulum* (method of Calce, 2012).

Sex was also estimated for adult individuals. Methods evaluating features on pelvic bones are preferred for sex determination (*e.g.* Bruzek, 2002), the point being that the pelvic bone can well adapt to locomotor and reproductive stress. Where pelvic bones were unavailable for analysis, sex-specific features on the skull were studied by a combination of methods (Buikstra and Ubelaker, eds, 1994; Ferembach *et al.*, 1980). The individuals were assigned values: female (F, F?), male (M, M?), indifferent individual (I), and sex undetermined.

The basis for the calculation of stature was the measurement of lengths of the long bones and the subsequent substitution of their dimensions into regression formulas (Sjøvold, 1990). This method is based on relationships between skeletal elements and height. The reliability of this method is affected by the different proportionality levels of individual limb long bones in various population groups across space and time.

Health state was assessed at the aspect level using comparisons with Aufderheide, Rodriguez-Martin (1998), Ortner (2003), Smrčka *et al.* (2009) and Waldron (2009). When it comes to pathological changes, evidence of trauma or injury (such as bone fractures), the presence of dental caries and evidence of disease were observed. Concerning skeletal indicators of stress, both non-articular and articular manifestations were monitored (such as linear hypoplasia, dental attrition, enthesopathy, arthrotic changes, or Schmorl's nodes). The occurrence of anatomical features in the assemblage was also recorded (Velemínský, 1999, p.125). In extreme cases, such features are used as possible indicators of kinship.

In terms of estimated age at death, most individuals (71.3%) were classified as juvenis and adultus I, *i.e.* aged 14–30. Sex was determined for a total of 45 individuals. Thirty-four individuals (51.5%) were estimated to be male or more likely to be male, and elevens individuals (16.7%) were estimated to be female or more likely to be female. The sex of the remaining twenty-one individuals (31.8%) could not be determined due to the lack of sex-specific features on the skeleton or with regard to age-at-death. Making an estimation from the available skeletal material, the health state of the population was very good and only a very few pathological

Table 1. Summary of demographic specifics of tested individuals (the method of determination is described in the text) and results of strontium isotope ratio analysis.

Number of the individual	Age at death	Method	Sex	Method	Stature	Average height	Sample number	$^{87}Sr/^{86}Sr$	Error	PCL LAB ID_2020	Anatomy
050-02	18–25 year	tooth attrition	M	Pelvis	170.1 – 179.1	174.6	Sem1	0.712131	0.000024	PCL_0266	molar
052-01	17–25 year	ossification	M	Pelvis	173.4 – 182.3	174.6	Sem2	0.712967	0.000023	PCL_0267	molar
052-02	20–34 year	facies auricularis	F	Pelvis	166.6 – 176.4	155.9	Sem3	0.715491	0.000039	PCL_0268	molar
053-01	15–20 year	ossification	F	Skull	157.0 – 165.3	161.2	Sem4	0.712954	0.000028	PCL_0269	molar
054-01	15–20 year	ossification	M	Pelvis	169.0 – 178.0	173.5	Sem5	0.709285	0.00003	PCL_0270	molar
056-01	24–35 year	tooth attrition	F	Skull	167.9 – 176.9	172.4	Sem6	0.708246	0.00003	PCL_0271	molar
056-02	24–30 year	tooth attrition	F	Skull	168.4 – 178.2	173.3	Sem7	0.709139	0.000036	PCL_0272	molar
057-02	30–40 year	tooth attrition	M	Pelvis	171.2 – 180.2	175.7	Sem8	0.712533	0.000038	PCL_0273	molar
057-03	40–60 year	acetabulum	M	Pelvis	170.1 – 180.1	175.1	Sem9	0.711062	0.000022	PCL_0274	molar
060-01	24–50 year	facies auricularis	M	Pelvis	163.9 – 174.5	169.2	Sem10	0.71157	0.000023	PCL_0275	molar
061-01	20–25 year	ossification, tooth attrition	F	Pelvis	159.0 – 167.3	163.2	Sem11	0.711081	0.000021	PCL_0276	molar
067-01	20–30 year	tooth attrition	M	Pelvis	172.8 – 181.8	177.3	Sem12	0.709698	0.000024	PCL_0277	molar
107-02	15–20 year	ossification	M	Pelvis	–	–	Sem13	0.710325	0.000023	PCL_0278	molar
107-04	35–45 year	tooth attrition	M	Pelvis	156.4 – 166.2	165.1	Sem14	0.708668	0.000015	PCL_0279	molar
108-02	25–35 year	tooth attrition	M	Skull	166.6 – 175.6	171.1	Sem15	0.710084	0.000026	PCL_0280	molar
108-04	18–25 year	tooth attrition	M	Pelvis	173.1 – 183.7	178.4	Sem16	0.718536	0.000022	PCL_0281	molar
109-03	18–25 year	tooth attrition	–	–	172.0 – 181.0	176.5	Sem17	0.71104	0.000026	PCL_0282	molar

changes were observed; no traumatic injuries related to violent death were noticed (Drnovský and Průchová, 2021).

During the first research season 36 individuals were recovered, 17 individuals being selected for subsequent isotopic analysis. The skeletons for analysis were chosen to cover both the southern and northern rows, to come from single and multiple graves, and vary in position from standard to unburied. During the post-excavation phase, demographic parameters were estimated for the recovered skeletons based on preserved traits. The result gives an idea about the composition of the assemblage, such as the age and sex composition supplemented by body stature, and any evidence of injury, disease, evidence of stress and possible anatomical variations (Table 1).

The individual buried in the ditch (2A-67) was classified as adultus (20–40 years). Estimation from several preserved sex-specific features on the left pelvic bone, the sex of the individual is estimated to be more likely male (Drnovský *et al.*, 2021).

2. Methods of the strontium isotope ratio analysis and statistics

Because of its chemical closeness to calcium, strontium can easily replace the lighter element in enamel, dentin or bone. Strontium enters the body through food, where the $^{87}Sr/^{86}Sr$ isotopic ratio corresponds to the ratio in local soil. The enamel of the first permanent molar tooth carries an isotopic record from childhood, because the first permanent molar just begins to mineralise before birth, and the vast majority of the enamel is mineralised early after birth (Ash, 1993; Harris and McKee, 1991; Scheuer and Black, 2000, p.151; Ubelaker, 1989, Fig. 62, pp.112–113, Yamunadevi *et al.*, 2021). While bone tissue is active and undergoes remodelling during one's life, dental enamel reflects information from the time of tooth mineralisation (Ash, 1993; Harris and McKee, 1991; 2021; Hillson, 2005, p.207; Scheuer and Black, 2000, p.151; Ubelaker, 1989, Fig. 62, pp.112–113, Yamunadevi *et al.*, 2021).

Isotopes pass through the food chain (from soil to plants, then to herbivores and carnivores) in an unfractionated manner, and the isotopic composition of the organism reflects the composition of soil and bedrock of the place where the individual resided (Gosz and Moore, 1989; Miller *et al.*, 1993). By comparing the isotopic record of enamel and bone or of enamel of different teeth (*e.g.* the first versus third molars), it is possible to reconstruct the migration of an individual in a geologically changeable environment during various life stages (Lenihan *et al.*, 1967; Price *et al.*, 1985). Strontium is found in rocks in the form of four isotopes: ^{84}Sr, ^{86}Sr, ^{87}Sr and ^{88}Sr. The ^{87}Sr isotope is produced by the radioactive decay of ^{87}Rb and slowly accumulates over geological time. This isotope is expressed as a ratio to the stable ^{86}Sr isotope ($^{87}Sr/^{86}Sr$). In rocks which are old (>100 million years) and contain high levels of rubidium, the $^{87}Sr/^{86}Sr$ isotope ratio is high. This is typical of areas with old granitic rocks, gneisses and old sedimentary rocks. In rocks which are geologically younger (<100 million years) and have a low rubidium content, the $^{87}Sr/^{86}Sr$ isotope ratio is likewise low; such rocks include, for example, young volcanic rocks. The above values are then transferred by weathering into soil and subsequently through plants into fauna and humans. The dispersion of this ratio appears to be very small. Typical low values are something like 0.704, while values of 0.720 are considered to be high.

This difference is very easy to measure (Montgomery *et al.*, 2005). Rodents, or snails, that live in the area throughout the year and throughout their lives are usually used as reference values for the bedrock (Price *et al.*, 2002; Hoppe *et al.*, 2003; Bentley *et al.*, 2002; Nývltová Fišáková, 2008; Nývltová Fišáková *et al.*, 2009). Strontium present in bone binds to PO_4^- instead of calcium (Ca_2^+). The ratio between Zn and Sr can be used to determine the diet of animals and humans: in herbivores, there is more strontium and less zinc; the ratio is reversed for carnivores (Smrčka, 2005). Because the geological bedrock is not the same everywhere and rocks of different ages occur in different places, the ratio between the unstable ^{87}Sr isotope and the stable ^{86}Sr isotope in animal bones and teeth can be used for the identification of areas where the individual lived in different stages of his or her life and thus to determine his or her migration (Grupe, 1997; Price *et al.*, 1998; Price *et al.*, 2001; Price *et al.*, 2004; Schweissing and Grupe, 2003; Bentley *et al.*, 2003; Bentley *et al.*, 2004; Smrčka, 2005). To identify possible migrations during an individual's lifetime, samples were collected from the enamel of the first permanent molar (mineralised during prenatal life and unaffected by diagenetic processes) and from dentin or bone (renewed every 7 to 10 years, see Trickett *et al.*, 2003; Richards *et al.*, 2008). Recent shells of the Roman snail (*Helix pomatia*) were sampled to determine the $^{87}Sr/^{86}Sr$ values for the bedrock. These recent shells were used because there were no other animal remains. Snail shell samples were collected directly at the burial ground. We consulted the results with the geological bedrock, where Quaternary river sediments are found on the site and the site is located in a floodplain. The results of the analyses are in agreement with the geological bedrock. Shells were collected nearby. Within a radius of 20 km, the rocks are the same.

Enamel fragments were sampled from each tooth. Large fragments were broken into smaller pieces under ethanol in agate. The resulting power was pretreated by abrasion with pure silica sand, also under ethanol. The cleanest fragments were then hand-collected under a binocular microscope. The cleaned enamel was then treated in order to remove diagenetic Sr according to the procedures specified by Dudás *et al.* (2016). Shells were initially washed several times in an ultrasonic bath while immersed in 18 moles of water. Then, each shell was cut longitudinally. To remove the periostracum, each shell was soaked overnight in concentrated, ultrapure H_2O_2, followed by a thorough rinse.

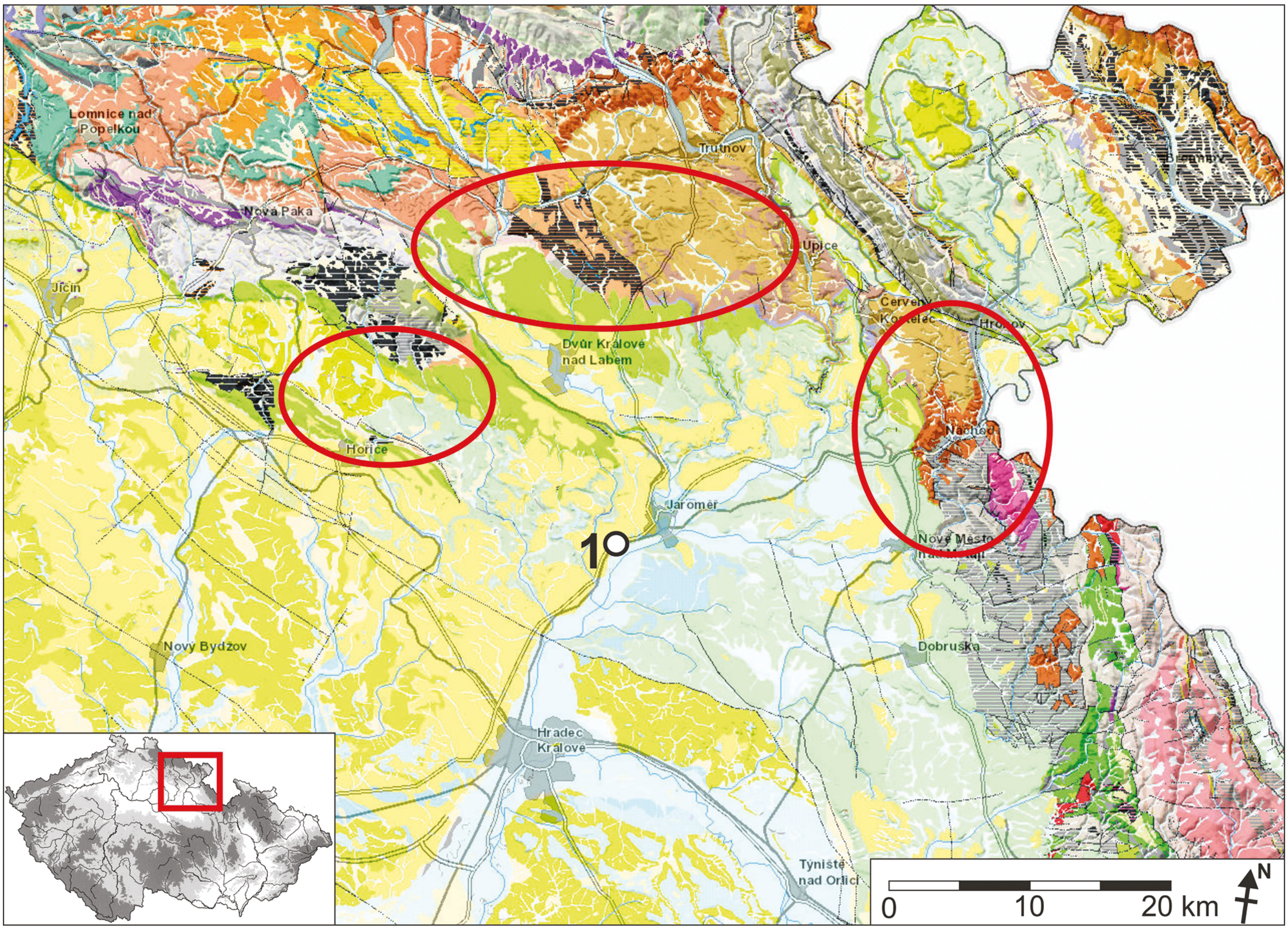

Figure 5. Geological map of the town of Jaroměř and its surroundings, on which the probable birthplaces of people buried at the investigated site are marked in red. Point 1 – location of the Semonice site. Source: geology.cz.

After all pretreatment procedures, the enamel and crushed shell material were dissolved in ultrapure HNO_3 and Sr was separated by standard ion-exchange procedures using Eichrom Sr-Spec resin. The Sr isotopic composition was determined at the Center for Applied Isotope Studies, University of Georgia (USA), using a Nu-Plasma II MC-ICP-MS in static mode. The $^{87}Sr/^{86}Sr$ ratios were corrected for mass bias using the exponential law and the value of $^{86}Sr/^{88}Sr=0.1194$. ^{87}Sr was corrected for the presence of rubidium (Rb) by monitoring the intensity of ^{85}Rb and subtracting the intensity of ^{87}Rb from the intensity of ^{87}Sr using the value of $^{87}Rb/^{85}Rb=0.386$ and the mass bias correction factor determined from $^{86}Sr/^{88}Sr$. All analyses were corrected for isobaric interference of krypton (Kr) impurities in argon gas (Ar) using measured zero-bias peaks which are set at 2% for ultrapure HNO_3. The value determined for NBS 987 during the processing of these samples was 0.710241±0.000023 (2σ).

For statistical analysis, the Wilcoxon test was used to compare data. Program R 4.0.2 was used for analysis with gplots 3.0.4 package. Unless noted otherwise, p-level<0.05 was considered significant.

3. Results and discussion

The results of the strontium isotope ratio analysis are shown in Table 1. The problems of using snail shells were discussed by Britton *et al.* (2020) with a conclusion that the snail shells may be problematic, because since the snails consume usually just plant tops and the strontium contents in their shells do not fully reflect the biovariable strontium in the soil. However, the authors assume that they can be used as a reference samples when the results of strontium contents from the snail shells is compared with other data from the site. This was also our case, since the strontium contents in the snail shells corresponds with the dispersion of biovariable strontium for the Quaternary sediment area in the surrounding. In the work of Holt *et al.* (2020) analyses of biovariable strontium in subsoil were performed, but only for England, Australia and Madagascar. There has also been studies available that processed data from the whole of Europe (Bataille *et al.*, 2020, Hoogewerff *et al.*, 2019), but the investigated areas were too large and the Czech Republic was sampled in only two places, so it does not absolutely reflect the exact isoscapes for the territory of the

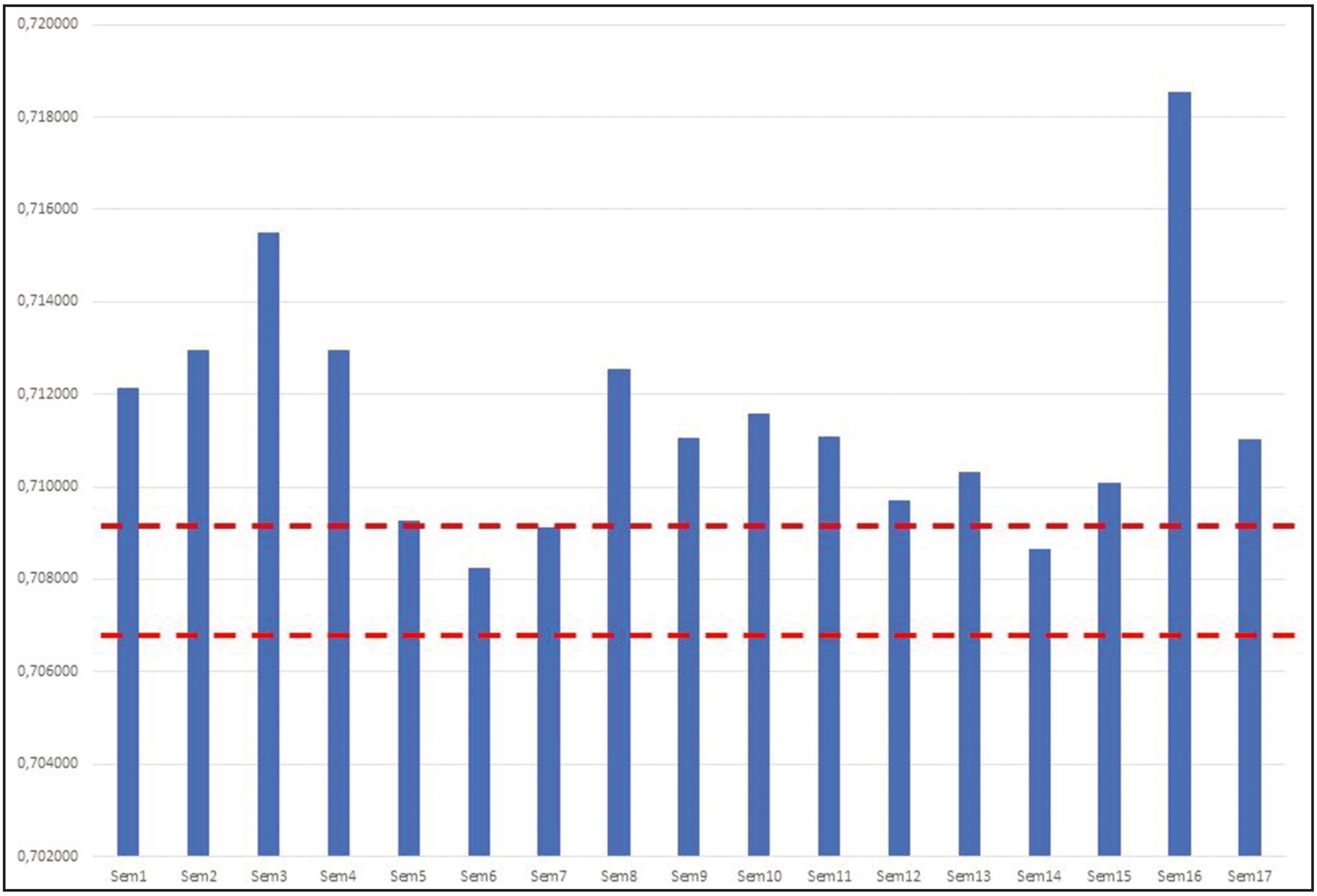

Figure 6. Strontium isotope ratios in the studied individuals. Red dashed lines show range of subsurface strontium signals based on snail shell strontium isotopic ratios.

Czech Republic, but it does approximate data from countries where there are younger rocks than in the Bohemian Massif, which belongs to the rocks of the continental shields, *i.e.* it is of Pre-Cambrian age and there are many Paleozoic metamorphic and igneous rocks that have a higher isotopic ratio of biovariable strontium. Most of the rocks in Europe are younger with a few exceptions. Large-scale data collected around the world cannot be used without knowledge of local isoscapes in relation to the local geology. Considering that there has been the analysing of strontium isotopes in the territory of the Czech Republic for more than 20 years and signals of biovariable strontium from various sources can be found in various articles, for instance Smrčka *et al.* (2006), Prohaska *et al.* (2002), Pryor *et al.* (2008), Vašinová Gáliová *et al.* (2013), Richards *et al.* (2008). The authors of this paper have a database of biovariable strontium from various sources across various rock environments throughout the Czech Republic at their disposal (Nývltová Fišáková, unpublished data).

As can be seen from the examined individuals, most of the them did not originate from the site's geological environment (range of geological background $^{87}Sr/^{86}Sr$=0.707599–0.708666) and might therefore be considered as of non-local origin.

Individuals who can be identified as being of local origin are a woman buried in the grave 056 (sample Sem6 – individual no. 056-01) and a man who was buried in the grave 107 (sample Sem 14 – individual no. 107-4) (Figures 6 and 7). Quaternary fluvial sediments and alluvial sediments and loess occur in the vicinity of Semonice according to the geological map, which corresponds to the low values of strontium isotope ratios (Figure 5).

Other individuals come from a geological environment which corresponds to Mesozoic and older rocks – *e.g.* the area of the Krkonoše, Jizerské, and Orlické Mountains (Figure 5). For a more precise determination of its origin, it would be necessary to take comparative samples from selected sites.

According to the results of the analysis, it can be concluded that the buried individuals were part of an encamped army. With regard to the origin of these individuals who have been determined as coming from the area of Central Europe, the buried individuals were almost certainly members of the Habsburg army, which was composed of such soldiers. We consider the women represented in the ensemble to have been part of the army as companions (*vivandières* – camp followers). Women were a common part of Modern Age armies (Hacker, 1981).

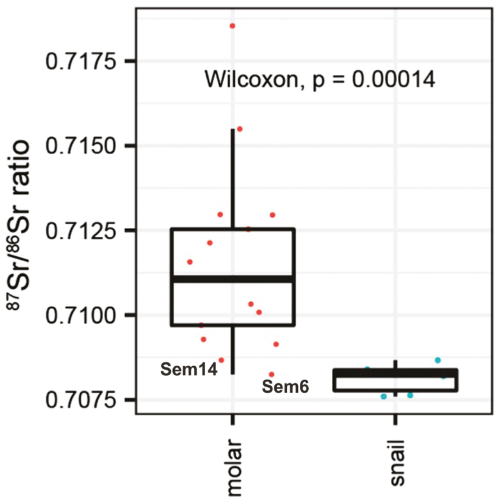

Figure 7. Wilcoxon test results (boxplots) for the buried individuals and for snail shells. It is apparent that only two samples, Sem6 and Sem14, fall within the observed range.

However, a local origin for two of the individuals was determined, which probably means that inhabitants of the nearby village of Semonice had been buried there as well. The Prussian army recruited the population from its own territories. In the 18th century this was the area of present-day Poland, the eastern parts of Germany and the southern part of the Baltic (Duffy, 1974, 54–57). This is an area with a different geological environment.

Based on the isotopic analysis, it can be concluded that two individuals (056-1 and 107-4) come from the local region. Individual 056-1 found in a double grave was estimated to be a woman aged 24–35 years. The second individual from this grave is also female (056-2) and in almost the same age at death 24–30 years, yet individual 056-2 is non-local in origin based on the results of the analysis. Both were also relatively tall for the time, 056-1 measuring 172.4 cm on average and 056-2 173.3 cm. In contrast to this, individual 107-4 was a man aged 35–45 years and of a relatively small average body height of 161.3 cm. This man was buried in a grave with three other men and one individual with non-estimated sex. Two individuals are juveniles (15–20 years), one is a young adult (20–25 years) and the last lived to adulthood (20–40 years old). No common features in the form of anatomical variations were observed. The burial rite at the studied site was very varied, ranging from non-reverent positions, as if the bodies were carelessly thrown in, to reverent burials with personal belongings in the form of jewellery (Drnovský and Průchová, 2021). This also applies to the two individuals with local isotopic values who were buried together with the foreigners. To more fully interpret this, we probably have to think about the variety of life and the impact of individual events that go beyond our theoretical framework. Apart from the genetic examination, we do not possess any clues which would indicate any possible relationship between these two "local" individuals. In order to establish a closer relationship between the buried individuals, a more detailed genetic analysis would be necessary; and for the exact origin of the individuals, it would be necessary to carry out more detailed geochemical analyses from selected areas where we have analyses of strontium isotope ratios. Unfortunately, the written records were not able to help us as there is no mention of those buried at that place.

4. Conclusion

Strontium isotope analysis is not currently commonly used in the analysis of modern skeletal remains. It is assumed that in the modern period there are historical records and that contextual information is mainly obtained from them, but as this study shows, this analysis can be helpful even in the modern period. Strontium analyses are also successfully used in forensics. The application of strontium isotope ratios to selected individuals buried in the cemetery in Semonice showed that it can yield results that can be used for the interpretation of the historical events accompanying the establishment of the cemetery. It was concluded that the buried individuals were not of local origin, so it can be reasonably assumed that the burial ground was established for the residents of a nearby military camp. This corresponds to the anthropological profile of the individuals. Since the buried individuals were determined to be Central European in origin, the troops can be identified as Habsburg troops, and therefore the dating of the event can be narrowed down to 1758 or 1778, when the Habsburg army was encamped here.

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