FORENSIC ARCHAEOLOGY – SHOULD IT BE A THING?

A Case Study

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Forensic archaeology can be described as an application of archaeological methods to forensic practice. Archaeology is a discipline that interprets the past; therefore, it is not common practice to use archaeology and archaeological methods in police or forensic investigation. In Slovakia, archaeologists are called to attend the body scene of skeletonized remains in some regions only rarely and that can often lead to the destruction of historical heritage or desecration of human remains. Such handling of human remains is visible on the case report discussed in the article, where unknown culprits disposed human remains from their original unknown place. Forensic archaeology is commonly used in such cases in the United Kingdom, where it is also commonly taught as a separate discipline in universities. The establishment of the field of forensic medicine or training proper authorities dealing with these cases is indeed needed in Slovakia to prevent further destruction of historically important remains and sites.

INTRODUCTION

Archaeology is a discipline seeking to explore the past through excavation and analysis of various types of materials. On the other hand, forensic science deals with the present rather than the past. There is confusion regarding the relevance of archaeology in forensic science, however, there is a range of skills that archaeologists possess and are applicable to forensic contexts. Many archaeological techniques have developed over time and thus are utilized in crime scene investigation and further crime investigation. Excavation of archaeological sites and processing the crime scene are destructive activities, therefore it is crucial to document and preserve the maximum of the clues in situ. Forensic archaeology can be used for investigation of clandestine burials, buried weapons and stolen items, dating strategies, landscape surveys, digital spatial analysis and visualization, mapping of surface finds, metal detection (shooting scenes), fire scenes investigation (cremated human remains – cremains), GIS landscape analyses, osteological analyses, underwater investigation, $^{14}$C analyses, and many others (Alfsdotter 2021; Gil-Chavarría et al. 2020).

Throughout Europe, forensic archaeology and anthropology are used by forensic institutes, police forces, private companies, universities, non-government organizations, museums, intergovernmental institutions, and archaeological companies (Alfsdotter 2021; Groen/Márquez-Grant/Janaway 2015). Forensic archaeology is highly recognized in mass grave investigation and disaster victim identification (DVI; Gould 2007; Márquez-Grant 2018; Putško et al. 2019; Sledzik/Mundorff 2016). The forensic archaeologist is an expert on the context of the burial – environment and wider landscape.

In Slovakia, there are some university faculties where archaeology can be studied, but none of them teaches forensic archaeology or offers training for forensic purposes (Masníkova/Beňuš/Obertová 2015). It is probably because the Slovak police only require the services of archaeologists in cases of devaluation of archaeological heritage or when dealing with metal detector enthusiasts. In recent years, metal detector enthusiasts are very common and an increasing number of illegal archaeological activity is reported.

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every year. This illegal activity often leads to uncovered human remains found in woods, where training in forensic archaeology would be beneficial in further identification of such cases.

In Slovakia, handling human bones from unknown settings is carried out by police personnel. If there is a reason to believe that the remains are of historical character, archaeology or anthropology specialists are called in, especially in Bratislava and Trnava region. However, this practice is not common in some other regions, and such specialists might not be called at all. Nevertheless, some initiative from the Institute of Forensic Medicine and Medicolegal Expertises (ÚSLaME) at the Jessenius Faculty of Medicine in Martin of the Comenius University in Bratislava has been established in terms of lectures for both police officers and forensic medicine doctors.

When human bones are uncovered in Slovakia, the specific protocol should be followed. This procedure is very brief and is described in the Criminal Procedure Code (Act no. 310/2005 Coll. The Code of Criminal Procedure). Usually, human remains are photo-documented before and after excavation. They are handled with care and packed in paper envelopes and sent to the juridical Forensic Medicine Department for further analysis (Putško et al. 2021). A recent legislative act, Act no. 131/2010 On Funeral Undertaking, does not distinguish skeletal remains specifically, therefore every dead human body must be examined by a medical examiner, regardless of the stage of decomposition. During this initial examination, the medical examiner decides whether an autopsy is required or not. An autopsy is always ordered if the remains are skeletonized, and the involvement of another person is not ruled out.

The scope of this paper is mainly osteoarcheological (focused on human bones from archaeological context), therefore the article presents a case report of human bones found in an unusual context, where the scene management failed at identification of found remains as archaeological heritage. Other than that, this case report is a very common practice of defamation of both human remains and cultural heritage. This article is demonstrating the relevance of having archaeologists or anthropologists at the scene to prevent misinterpreting the context and consequently mishandling of the findings, e.g., improvised packaging, documentation, transport.

CASE REPORT

Material and methodology

In April 2021, human remains lying on a mound of soil were found near the country road in the cadaster of the village Brunovce, dist. Nové Mesto nad Váhom (Fig. 1–3). Police investigators and technicians

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3 Case evidence number: ČVS: ORP-126@NM-NM-2021.
Fig. 2. Brunovce, dist. Nové Mesto nad Váhom. View of the road where human remains were found. Source: Slovak Police, file photo.

Fig. 3. Brunovce, dist. Nové Mesto nad Váhom. Two mounds of soil with visible human skeletal remains on top of them. Source: Slovak Police, file photo.
were called, and a certified commercial medical examiner was notified to examine the body scene. At the scene, a few bones lying on top of the soil were visible. It was clear that the remains (along with the soil) were brought there by an unknown delinquent with the intention of getting rid of the remains. Upon more detailed examination, one human cranium (Fig. 4) and 66 more bone fragments were found. Every fragment was photo-documented, however not at the location where it has been found within the soil. Remains were sent to ÚSLaME for further analysis as part of an expert opinion, which is regularly prepared for police upon request.

All remains were packed in paper envelopes, with every clue (1–66) separately. Bones were cleaned at the institute and underwent anthropological analysis, where a biological profile was established. Standards for data collection from human skeletal remains were used (Buikstra/Ubelaker 1994) for establishing the sex, and age at death.

Results

Analysis established that all 66 fragments were indeed of human origin. Two sets of skeletons were identified; however, the remains were comingled, therefore it was impossible to distinguish between the individuals properly. The excavation was not conducted by archaeological standards. The conclusion of the anthropological analysis was that the remains were of two adult individuals, one of them male, 29+ age at death with no signs of traumatic changes on the skeleton. Remains were fragmented; therefore, stature estimation was not possible. No pathological changes were observed. Green copper staining was visible on three bone fragments, on one of them (radius) before the anthropological analysis (Fig. 5). Another two stained areas were spotted on the ilium and a rib fragment (Fig. 6).

In the expert opinion was stated that remains were not under the statute of limitation⁴, and that the police department should inform the competent Monuments Board of the Slovak Republic (KPÚ) subsidiary. In September 2021, remains were sent to the KPÚ subsidiary for further investigation.

⁴ Remains where the involvement of other person (e.g., murder) is not ruled out, are under different types of statute of limitation, depending on the severity of the crime (Act 300/2005 Coll. Penal Law).
Fig. 5. Brunovce, dist. Nové Mesto nad Váhom. Human radius with visible green copper staining at the diaphysis. Documented prior to the anthropological analysis. Photo by Slovak Police, file photo.

Fig. 6. Brunovce, dist. Nové Mesto nad Váhom. 1 – green copper staining on the ilium; 2 – green copper staining on a fragment of a rib. Documented after cleaning and anthropological analysis in the laboratory. Photo by M. Putško.
DISCUSSION

Forensic archaeology can be described as an application of archaeological theory, methods, and techniques in a legal or forensic context. It applies archaeological techniques to the search, and recovery of evidence material from crime scenes. Archaeologists are often considered to be experts at reading landscapes (e.g., vegetation, topography) and stratigraphy which can be invaluable in crime scene investigation. Unfortunately, most methods of archaeology are not yet established or used in Slovak forensic practice.

Human body excavation is described only briefly in the manual for police investigators, and in the Criminal Procedure Code. However, manuals are more focused on how to investigate the dead body and not on how to excavate one. For burnt human remains, or cremains, no methodology of excavation and processing is established.

Application of archaeological procedures to forensic investigation

Recently, in countries such as the United Kingdom, the field of forensic archaeology is very popular and is taught at many universities. For past years, the role of archaeology in a forensic investigation has been focused mainly on excavation techniques and documentation (Haglund 2001). However, nowadays, there are many other methods and techniques which can be used in both crime scene investigation and analysis of artefacts and human remains. Usually, the application of archaeological expertise to forensic settings has been achieved more by borrowing methodologies and techniques than by utilizing archaeologists themselves (Haglund 2001).

Methods routinely used within archaeology with possibly the biggest potential are geographical information systems (GIS), LiDAR, geophysical monitoring, etc. (Blau et al. 2018; Congram 2008; Pringle et al. 2020). They are non-invasive approaches popular in archaeological surveys which forensic science can leverage in searches for clandestine burials.

Relatively new archaeological analyses being adopted by cutting edge researchers include stable isotopes analyses used for migration studies and reconstruction of diet. However, their costs and dependency on highly specialized laboratory equipment dissuade from their application in the everyday workflow (Meier-Augenstein 2019).

The case report discussed in the article is only one of many cases when incorrect identification of historical relevance of the remains was not properly established at the scene and no specialist with training in archaeology was called at the scene. The statute of limitation in Slovakia is 20–30 years and another person’s involvement must be ruled out when examining the remains. However, in most cases, medical examiners cannot date the skeletal remains, thus most of the skeletal remains are considered forensic until proven otherwise (Pustko et al. 2021). Such series of unprofessional steps often leads to a halt in an investigation once forensic nature is ruled out. Police investigators close the case, meanwhile being conducted as a homicide by default, either without reclassifying it to another crime (unauthorized handling and disturbance of archaeological heritage), or its handover to KPÚ. A case from several years ago bearing similar elements resurfaced on ÚSLaME, where skeletal remains, later dated to the Bronze Age, were stored there because of the abandoned police investigation. In 2019, another skeleton was found near the original place, however, in 2019, an expert from KPÚ was notified and present at the scene. This led to discovering that the skeleton stored at ÚSLaME since 2015 belongs to the same location.

The increasing number and more frequent occurrence of such mishandled, under-documented or even lost cases advocate for the relevance of forensic archaeology, or even a team directly dedicated to skeletal findings within unknown settings to excavate, document and process those remains.

Since forensic archaeology is a form of (applied) archaeology, the usability of archaeological methods needs to be successfully incorporated in forensic archaeological casework, as related to police cases (e.g., searches, excavations, exhumations, and field recoveries). The aims of forensic archaeology should be to conduct research and evolve beyond the general boundaries of a technical investigation. Forensic archaeological practice as a scientific process must be able to generate new forensic knowledge and new ways to look at the physical evidence. To improve its operational field methodology, forensic archaeology, as a science, should focus on the pedological, ecological, biological and criminalistic theories and models that are needed to understand site formation processes and taphonomic transformations. Additionally, forensic archaeologists should

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5 Case evidence number: KPUTT-2019/9996-5/38103/SI.
keep up to date with new research and development within 3D documentation, predictive modelling, GIS science, geophysics and remote sensing and incorporate these innovations into their investigative framework. By integrating criminalistic and criminological theories and models into its interpretative framework and by using the archaeological research methods and practice, forensic archaeology, as social science, should try to interpret and reconstruct human activities that took place at the crime scene or place of incident.

An archaeological report will compare the results obtained from the finalized excavation/recovery with results acquired from past excavations/recoveries that took place in the vicinity of the studied archaeological site. This is important since the identification of (dis)similarities with previous archaeological studies can aid in further testing of hypotheses, offer new research questions, and help the evaluation of the archaeological research strategy and field methodology.

In archaeology, all individual lines of research, for example, physical anthropology, zooarchaeology, archaeobotany and ceramic analysis, will eventually be combined in one overall synthesis aka excavation report. Integration of data and information, as obtained during a forensic archaeological investigation of a police case, is currently not considered part of forensic archaeology. Forensic archaeological analysis and interpretation should be combined with analyses and interpretations obtained from forensic anthropology (e.g., taphonomic analysis) and forensic ecology (e.g., postmortem interval estimation), to offer a multidisciplinary evaluation of the encountered evidence and the most likely reconstruction.

To summarize, the proposed framework will be able to force the forensic archaeologist to consider alternative hypotheses or will point him/her towards new hypotheses (and therefore new scenarios) and consequently initiate a search for alternative physical evidence.

**Application of forensic procedures to archaeology**

This relationship of mutual enrichment could also work the other way around. Worth mentioning is the application of forensic fire investigation techniques to archaeology that can be used for estimating whether the fire could have been an arson or an accident (Harrison 2013). With cremains, reconstruction of the temperature or intensity of burning, the condition of the bone when it was burnt, and if a bone was directly or indirectly exposed to heat also arose more from forensic investigations than from archaeology (Scott et al. 2010). But probably one of the most exciting could be the use of imaging methods (e.g., forensic radiology, postmortem CT) for the reconstruction of evidence of interpersonal violence and more (Kranioti/Grigorescu/Harvati 2019).

**IMPLICATIONS OF FURTHER DEVELOPMENT OF FORENSIC ARCHAEOLOGY IN SLOVAKIA**

One of the possible blanket solutions for Slovakia could be the founding of a team of experts from various fields or subfields (archaeology, taphonomy, anthropology, forensic archaeology, GIS) which could become a go-to place for consulting any human remains of skeletal nature found. Similar team – Cranfield Recovery and Identification of Conflict Casualties (CRICC) team, of which the main author has been a member since 2019, operates worldwide and is dedicated to war casualties. Using the CRICC team as a template and given the surface area of Slovakia, such a team can be decentralized, and appropriate members of the team could respond only upon request.

The importance of forensic archaeology might be disputable in Slovakia, due to the limited number of cases where it can be applied in such a small country. However, the archaeological techniques proved to be recognized even among higher-ranked police officers. Slovak lieutenant colonel together with other countries’ representatives attended European Meeting on Forensic Archaeology in the UK held at the University of Central Lancashire, where proper excavation techniques of human remains were demonstrated. Similar training workshops and collaborative events are common practice at UK based universities. The popularity of these events has grown to a point that Cranfield Forensic Institute offers variously tailored courses for extra credits to its students and even to the public.

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CONCLUSION

In conclusion, both, in crime scene investigation and archaeological excavation, protection and preservation of evidence and skeletal remains is the main goal. However, police investigators might not always know the best option how to preserve the evidence that has been severely decomposed. Unfortunately, archaeology experts become involved in such cases only when invited (Masnicová/Beňuš/Oberlová 2015; Moses 2020).

The case report discussed in the article is only one of many with an improper approach at the scene and shows that, perhaps, forensic archaeology processes should be introduced into the practice when dealing with remains that are severely decomposed. The documentation provided by the police departments can be very insufficient and often remains are not excavated with care and in commingled materials without intention to distinguish between individuals. Such actions can affect further analyses, therefore the information that anthropologists and other specialists can provide might be limited.

In addition to unskilled on-site police investigators, a significant resistance towards cooperation, collaboration, and sharing the investigation with experts from different fields is still present in some parts of Slovakia. This state of uncooperativeness can be also due to a lack of education and propagation of new emerging methods and science fields within government organizations. An increased interlock between academia and these organizations could lead to significant benefits for all parties. Researchers from universities at the frontier of their fields can focus on aspects currently required by investigators and vice versa.

The stepping point for further development of the forensic archaeology field can be a series of guest lectures for police officers and medical examiners prepared by both archaeologists and anthropologists from local universities.

BIBLIOGRAPHY


Forenzná archeológia – mala by byť realitou?

Prípadová štúdia

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Súhrn

Forenzná archeológia je vo svete využívaná v prípade aplikácií archeologických metód do forenznej praxe. Naopak, na území Slovenska sú archeológovia na miesto nálezu náhodných kostrových ostatkov privolávaní len v zriedkavých prípadoch. To častokrát vedie k znehodnocovaniu a poškodzovaniu archeologického dedičstva či dokonca k hanobeniu ľudských ostatkov. Takéto zaobchádzanie s ľudskými kostami je viditeľné aj na prípadovej štúdií, ktorú predstavujeme v príspevku. Ide o aktuálny prípad z apríla 2021, keď neznámý páchateľ vyviezol ľudské ostatky z neznámeho (zrejme archeologického) náleziska na voľnú plochu pri vidieckej ceste v katastri obce Brunovce, okr. Nové Mesto nad Váhom (obr. 1–3). Privolani policajní vyšetrovatelia a súdny lekár po prezrení miesta nálezu zistili, že ostatky (ľudská lebka a identifikovaných 66 úlomkov kostí) sú v sekundárnej polohe a boli z miesta po základnej fotografickej dokumentácii

Predstavený príklad je jedným z mnohých a poukazuje na chýbajúcu primárnu spoluprácu s archeológmi, antropológmi a nevhodnú metódiku dokumentácie pri náleze náhodných ľudskej kostrových ostatkov v teréne. Úkony realizované policajným oddelením sú z hľadiska spôsobu dokumentácie nedostatočné, pozostatky nie sú kopané/vyberané metodicky, sú často zmiešané. Takéto úkony ovplyvňujú následne ďalšie analýzy, preto informácie, ktoré antropológovia a iní odborníci poskytujú, môžu byť obmedzené. Je preto potrebné, aby už na mieste nálezu bolo zabraňovanie nesprávnemu vykladaniu konštrukcie a následne nevhodnému zaobchádzaniu s nálezmi improvizovaným balením, dokumentáciou, dopravou.

Forenznú archeológiu môžeme definovať ako aplikáciu archeologickej teórie, metód a techník v právnom, resp. forenznom kontexte. Forenzná archeológia používa archeologické techniky na vyhľadávanie a získavanie dôkazov z miesta činu. Pri dokumentácii a výskume miesta nálezu je potrebné aplikovať metódy stratigrafie, ktoré archeológovia dôkladne poznajú a využívané. V slovenskej forenzné praxi však existuje aspoň len cestovného tómu, prípadne aspoň zaškolené profesionálovanú príslušných kontekstov a situácii.


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