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Development of forensic archaeology in Lithuania and identification of historical persons

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Abstract:

This article presents a brief overview of the development of forensic archaeology in Lithuania. From the beginning of the early 1960s, the disciplines of forensic osteology and anthropology have been intensively developed through extensive work on numerous mass graves left in Lithuania after wars and other social disasters. This has allowed individual researchers and their teams to develop and validate a set of original, population-specific forensic osteological methods. Nevertheless, the term *forensic archeology* is still new in Lithuania. Only over the last few years has a short program of forensic archeology been offered to students of archaeology. The potential application of forensic archaeology in solving legal issues still lacks the interest of law enforcement and governmental institutions. We want to emphasize the importance of close collaboration between different institutions and an interdisciplinary approach to these investigations as a core value in achieving final goals. In addition, the particular importance of international cooperation to properly commemorate the victims of wars is emphasized.

Keywords:

exhumations of mass graves, personal identification, forensic anthropology, craniofacial superimposition.

INTRODUCTION: HISTORICAL BACKGROUND

Wars and social disasters have left numerous mass or collective graves in Lithuania, which nowadays are objects of bioarchaeology that require close collaboration between the natural sciences and humanities and forensic anthropology. The beginnings of forensic archaeology in Lithuania has a tradition starting in the early 1960s [1], with experience gained from earlier excavations of the mass graves of the Holocaust, [2, 3] exhumation and identification of historical persons, [3, 4] and forensic-osteological/anthropological and bioarchaeological work. A set of original, population-specific forensic osteological methods has been developed and validated [3, 5, 6, 7]. *Forensic archaeology* is a relatively new concept in Lithuania, understood primarily as the practical application of combined knowledge and skills in archaeology, forensic and physical anthropology, and bioarchaeology. There are no institutionalized forensic archaeologists in Lithuania. Some cases of pure forensic exhumation are performed by police and supervised by forensic pathologists without the application of archaeological techniques. Only recently have the sites of mass graves from the 19th century and World War I and II inhumations been provided the status of archaeological objects: they are now formally protected by cultural heritage legislation, in this way covering the gray area between traditional archaeology and pure forensics. In recent years the potential of archaeologically gained evidence from the past (location, excavation and recovery of human remains and associated artefacts, and reconstruction of events related to burial)—especially in combination with bioarchaeology, palaeopathology and forensic archaeology, is being acknowledged, as archaeologists, some of them with basic training in osteology, are involved in some exhumation cases. This paper is a review of the results of the collaboration over the past three decades between anthropologists, archaeologists, and forensic pathologists and the lessons learned. Cases are grouped according to context and discussed in chronological order (i.e., dates of analysis), thus demonstrating the evolution of the field. At the same time, the specific problems of this interdisciplinary collaboration are outlined.

Over the past decade, students of archaeology have been given a short overview of the potential application of archaeology in legal issues, and specific cases are discussed. Regretfully, no elements of archaeology are included in police training programs or the postgraduate training of forensic experts.

EXHUMATIONS OF VICTIMS OF THE NAZI OCCUPATION

Beginnings: 1951–63

Several forensic exhumations of Holocaust sites were performed by legal authorities in 1951–1963. These investigations were performed at selected sites only, data was submitted to legal institutions, and no detailed scientific analysis was made (Fig. 1). Only group identification (number of individuals, sex, and age) was made in the field, and specific attention was paid to signs of violence and other material evidence [2, 3]. The aim of these investigations was limited to the legal requirements of the period: to provide evidence for courts prosecuting military criminals. No inquiries about the identity of the victims were made (eventually, even the ethnicity of the victims was hidden under the euphemism *Soviet citizens*). After a series of trials, this tragic period was almost forgotten. It is only during the last decade that memories have been revived, with the locations of executions being marked and protected by the state. Delayed justice is now being sought for these innocent victims [8].

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Fig. 1. General view of human remains exhumed and prepared for examination (a); skulls, arrows indicating gunshot wounds (b) in 1962 in the village of Katkiškės, Lazdijai District, Lithuania, 1962. From [2].

Excavation in 2008

In 2008 the State Genocide and Resistance Research Centre of Lithuania obtained information about possible mass graves on the western outskirts of Vilnius. The site was on the slope of a steep hill in a forest. At the request of the state prosecutor and the center, a trial 2x2 m trench was excavated by archaeologists from the Department of Archaeology of Vilnius University. Skeletal remains were sent for forensic anthropological analysis. It was established that the trench contained the commingled remains of at least 32 individuals with numerous traces of peri-mortem gunshot wounds (17 on skulls, 10 on other bones, with entrance diameters c. 9.2–9.7 mm) from bullets entering the bodies from various directions. Associated artefacts (personal belongings and coins) clearly indicated the time of death: the summer of 1941. Parallel questioning of evidence and documentary sources supported these findings; in July 1941 about 200 hostages (inhabitants of Vilnius, mostly Jews, but also some university students) were transported by Nazis in this direction and executed with machine guns at previously dug trenches. In the mid-1960s, the site was disturbed by looters, which evidently caused the disarrangement and commingling of remains. At the request of the Jewish community and religious leaders, no further excavations were conducted. After two years the investigated remains were officially reburied at the same site, and a small memorial sign was erected. This case stressed the importance of the coordination of archaeology and forensic anthropology, although neither complete excavation nor even an attempt to identify individuals was performed due to ethical and political tensions.

IDENTIFICATION OF HISTORICAL PERSONALITIES

Identification of the remains of Kristijonas Donelaitis

Kristijonas Donelaitis (1714–1780), a Lutheran priest, lived and worked in East Prussia and wrote the first classic poem in the Lithuanian language; it has become one of the principal works of Lithuanian poetry. He was buried on the property of the parish church of Tolminkiemis (*Tollmingkehmen*). After World War II, this territory was annexed by the Soviet Union and today is known as Kaliningrad District. The church was abandoned and the grave of Donelaitis was forgotten. In 1967 an archaeological expedition from the Institute of the History of Lithuania uncovered 25 graves beneath the ruins of the church; the two most recent became the subject of further forensic analysis. This revealed that both remains belonged to elderly males, individual No.1 (the older one) being subsequently identified as Donelaitis. As there was no portrait of him, a reconstruction of his face was performed by Vytautas Urbanavičius, student of Mikhail Gerasimov [3, 4]. This case evoked great interest in society and contributed to raising the prestige of forensic anthropology.

Identification of Radvilos (Radziwill) family remains

The Radvilos (*Radziwill*) family were highly prominent historical figures in the Grand Duchy of Lithuania and in the Polish–Lithuanian Commonwealth, producing many notable personalities in Lithuanian, Belarussian, Polish, and general European history and culture. It appears that the family, who reached the peak of their influence in the 16th and 17th centuries, considered Dubingiai (today a small village) to be their patrimony and erected a villa and a church there, which they chose to be their burial pantheon. During the upheaval of war in 1655–1665 (the Deluge), the church and villa of Dubingiai were plundered and destroyed and the Radvila family bodies removed from their crypt graves and scattered throughout the church. They were later hidden again to avoid a recurrence, but their location was forgotten. It was only during archaeological excavations in 2004 that a secondary burial containing the remains of eight adult individuals was found. During the complex research of the team of forensic anthropologists, historians, and archaeologists from 2004–2008, the remains were identified by employing various techniques, including specific taphonomy (e.g., traces of rodent gnawing suggesting that bodies initially were placed in sarcophagi, Fig. 2), analysis of pathologies, analysis of available portraits and skull–portrait superimpositions, statistical testing of probability, and DNA identification. It was considered to be one of the most significant historical and archaeological

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discoveries in Lithuania in recent decades, and the remains were given a state reburial [9]. This case was of special importance for the development of archaeology, anthropology and forensics, as it demonstrated the potential of such collaboration for society.

Identification of the remains of the leaders of the 1863–64 January Uprising

The January Uprising (1863–64) was an insurrection that started in the Russian Empire's Kingdom of Poland and aimed to restore the Polish–Lithuanian Commonwealth. It began as spontaneous protests in Warsaw, but quickly spread throughout the territories of the former Commonwealth (currently Poland, Lithuania, Belarus, and parts of Latvia and Ukraine). Outnumbered by Russian troops, the insurgents turned to tactics of guerrilla warfare but were defeated, and their leaders were captured and publicly executed in Vilnius. Twenty-one individuals were executed by shooting or hanging (Fig. 3).

In the winter of 2017, human remains were found during conservation work taking place on the territory of the Upper Castle of Vilnius. Archaeological contexts indicated these might be the remains of those leaders. Subsequent archaeological excavations revealed 20 skeletons. Complex identification work was taken creating „ante-mortem" (historical/archival: sex, age, time and mode of execution, photographs and individual morphological peculiarities of a person, search for living and deceased relatives) and „post-mortem" (archaeological and anthropological: sex, biological age, stature, pathologies and other morphological individualising traits of skeletonised remains, position of inhumations, DNA profiles) „portfolios" of each individual for subsequent cross-matching. It should be noted that craniofacial superimpositions and DNA identification were performed as "blind tests," contextual and other data not being known. It was considered that the matching of DNA was the most conclusive evidence; this way four individuals were positively identified (for additional data, exhumations of the graves of four relatives in historical cemeteries were performed; DNA also enabled investigators to determine which individual's remains were still missing). Craniofacial superimposition allowed investigators to identify (with a lesser degree of probability) six individuals. Two extra individuals were also identified on the basis of ante-mortem traumas, one on the wedding ring (besides other evidence). The identity of the remaining ones was determined on the basis of archaeological contexts and group identification data [10]. In summary, this work demonstrated that the success of such a study was possible only due to the collaboration of historians, archaeologists, bioanthropologists, and forensic experts, where anthropologists take the leading role due to the interdisciplinarity of their methodology. Moreover, data for craniofacial superimposition were used for the development of advanced semi-automatic identification software ('Skeleton-ID') [11] (Fig. 4).

INVESTIGATIONS OF MASS INHUMATIONS DURING WARTIME

Below we briefly discuss the excavations and subsequent analyses of several historic mass graves. Although not strictly forensic, these cases were a good opportunity to apply both archaeological and bioarchaeological methods, thus contributing to the development of skills that were used in more recent cases.

Fig. 2. Taphonomic changes (rodent gnawing marks) on foramen magnum of one of skulls from the secondary burial of Radvila family in Dubingiai.

Fig. 3. Traces of hanging—perimortal fracture of the hyoid bone (a) and firing squad—bullet entrance and exit wounds on the iliac bone (b) on bones of remains from the 1863–1864 Uprising.

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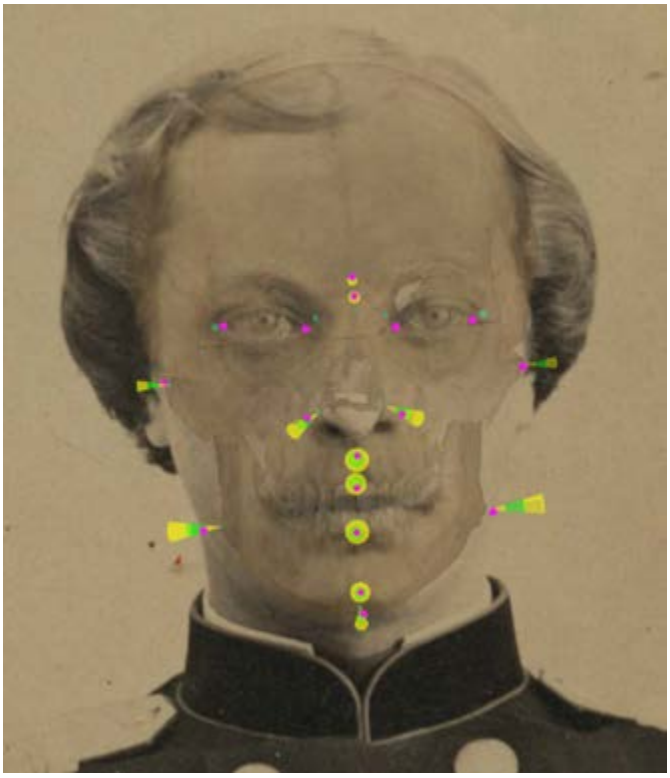

Fig. 4. Craniofacial superimposition results using Skeleton-ID software.

Napoleonic mass grave from the 1812 Russian campaign

This mass grave was discovered during construction work at the site of the former barracks of the Soviet Army in the northern suburbs of Vilnius in the late autumn of 2001. At first, several alternative hypotheses connecting this mass grave to the successive military and oppressive activities of the area (i.e., the Tsarist, Nazi and Stalinist periods) were considered. However, some preliminary observations made on the remains of uniforms (especially buttons showing the Imperial Eagle and regiment numbers) indicated that this mass grave was one of Napoleon's Great Army retreating from the disastrous campaign in Russia in 1812 [12]. In 2002 excavation covering a total area of about 600 m^2 took place. By the end of excavations, it was determined that the complete mass grave was located in an L-shaped trench about 40 m long and up to 10 m wide, starting 2 m below current ground level, which corresponded to former suggestions that this was an L- or V-shaped trench for a French artillery battery. From the beginning two teams were employed. French anthropologists applied a qualitative approach, using the methodology of funeral or forensic anthropology previously applied to plague mass graves and forensic cases [13]; local archaeologists from Vilnius University and bioanthropologists used a regular quantitative approach. The time constraints (roughly one month in early spring) made the two techniques complementary (Fig. 5). Due to methodological differences between the two teams, the preliminary results were slightly different. The accumulation of bodies on two sides of the pit showed that the trench was filled from its edges; it is highly probable that corpses were thrown from the side of the trench by the people in charge of the burial. The anatomical position of numerous skeletons strongly suggests that the bodies were handled crudely, thus causing the bodies to be intermingled.

Fig. 5. Excavation of Napoleonic mass grave in Vilnius (March 2002).

Fig. 6. Horse skeleton among human remains in Napoleonic mass grave in Vilnius.

Other evidence such as the simultaneous burial of horses and men also demonstrated a context of crisis (Fig. 6). The burial of corpses wearing clothes was clearly revealed by the location of various uniform remains in corresponding positions. Analysis of buttons and other uniform fragments allowed the identification of the remains of soldiers and officers from about 40 different regiments. The minimum number of individuals was 3,269, males being predominant, although the remains of at least 29 females were present. The density was about seven bodies per m^2, apparently identical along the entire trench. Detected unhealed injuries were scarce and cannot be associated with combat wounds. Most often, peri-mortem spiral fractures and comminuted fractures of long bones were found, probably occurring during the crude handling of bodies around the time of their disposal. In summary, archaeological and bioanthropological data coincide with historical records describing the burial of about 37,000 dead French soldiers in eight locations by the troops of Russian Field Marshall Kutuzov and local officials in defensive trenches constructed in the summer of 1812 by the French garrison. In this case, one such location was examined.

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This case, although historical, was of major significance for promoting the discipline due to the development of professional relations between specialists of different institutions, including foreign ones, the acquisition of practical skills in the investigation of mass graves (including techniques, logistics, etc.), and finally the awareness of the general public and legal institutions.

Excavation of a World War I German military cemetery

Experience gained during the excavation of the Napoleonic mass grave was extensively used in this excavation. In July 1915 the German army had occupied Panevėžys, the largest town in northeastern Lithuania. A gymnasium building was transformed into a military hospital. Soldiers who died in the hospital were buried in a cemetery created in the schoolyard. Historical data indicates that 580 German soldiers were buried there. At least in the beginning, Russian soldiers were buried there as well. The German troops had left by the end of 1918, but the cemetery remained. Regrettably, during the Soviet occupation in 1947 the cemetery was demolished, the tombstones were crushed and removed, and the area was used as a stadium for the school. It was only in 2005 that the decision was taken by the local municipality to exhume the remains for subsequent reburial. In 2005 an area of 4,070 m^2 was investigated and 191 burial pits containing the remains of 830 individuals were found. In addition, seven more remains were discovered in 2010. The inhumations had the character of orderly group burials, containing from 1 to 17 individuals oriented E–W and parallel to each other. Archaeological finds included ID tags, personal items, some ammunition, remains of uniforms, and medical devices. Routine anthropological analysis was performed at the site. A majority of the remains belonged to males up to 30 years of age. There were, however, also the remains of 5 females. However, personal identification was possible only for 26 individuals (18 identification tags, and 8 wedding rings with engraved initials). Interesting data concerning the health status of the military personnel were obtained. The highest number of pathologies observed proved to be various traumas, some of them with signs of treatment and healing. Evidence on the causes of those lesions is scarce: several deformed bullets (11 cases, one of them still in the cranial cavity) and comminuted fractures of limb bones prove the use of firearms. In a few cases, explosions could have been the cause of injuries (damage of several bones in the same area); furthermore, the presence of cut/stab wounds suggests the combat use of bayonets and swords. However, a significant number of skeletons (115 cases) were covered with lime, suggesting death from other causes, possibly infectious disease; the presence of chronic disease treatment is suggested by a certain number (32 cases) of osteoperiosteal lesions. The presence of dissected bodies (13 cases) indicates systemic analysis of the causes of mortality. All this indicates the functioning of a large hospital with qualified staff and at least several specialized departments. Such a large sample was a unique opportunity to perform anthropological analysis of remains coming from a well-known context [14]. The experience gained during such an excavation strengthened the skills of archaeologists in the excavation of mass burials, enabled bioarchaeologists to develop protocols for the examination of numerous remains, and increased their skills in the analysis of modern era traumas and the signs of relatively modern medical interventions on remains. Moreover, it also indicated the possibility of individual identification by artefacts in the context of war. Further developments of this trend of the examination mass graves is discussed in the paper by Ingrida Čičiurkaitė in this issue [15].

EXCAVATIONS OF CASUALTIES AFTER WORLD WAR II

Strong resistance against the Soviet Communist regime had already begun in the summer of 1944 in Lithuania, and armed resistance continued until 1953 [16]. The regime carried out massive deportations of "unreliable" persons and their families, and military operations caused numerous casualties, as well as the imprisonment and executions of participants and even potential supporters of the resistance. The result was another series of numerous clandestine burials.

The Tuskulėnai site

One such site was the area of Tuskulėnai, close to downtown Vilnius. According to information found in the former KGB headquarters, from 28 September 1944 to 16 April 1947 a total of 767 persons were executed (7 more died before their execution) in the Soviet NKGB/MGB prison. The majority (613 persons) were charged with treason and sentenced under Article 58 of the RSFSR Criminal Code. The executions were carried out by special groups of NKGB/MGB staff. After the executions, the corpses were buried at a site on the former estate of Tuskulėnai. The details of the executions and the locations of burials were secret under the Soviet regime. In 1994 evidence about these events became available to officials of the Republic of Lithuania, and a working group consisting of archaeologists, anthropologists, and forensic medicine experts was formed. The initial goal was to exhume and identify two prominent individuals of the Roman Catholic Church and anti-Soviet resistance. In June 1994 exhumation and identification work began. During the field seasons of 1994 and 1995, 706 remains were exhumed. During the construction of a memorial to the victims in the summer of 2003, 18 more skeletons were found. Very few archaeological artefacts were found (some remains of personal belongings, clothes, eyeglasses, medallions, pencils, etc.).

The excavation, subsequent analysis, and identification of individuals buried in this particular mass grave was a challenge and a serious examination of available skills and resources. Each skeleton was excavated individually by archaeologists and bioanthropologists, given a registration number, and then transported to the forensic osteology laboratory after team members concluded an initial examination and completed a field form. In the laboratory, each skeleton was analyzed according to routine protocols involving the collection of post-mortem evidence: sex, age, stature, and individual traits (such as healed injuries, traces of diseases and treatment, dental status, and peri-mortal lesions). Simultaneously, the collection of ante-mortem evidence took place: research in the former Soviet Committee for State Security (KGB) archives and analysis of letters and requests from relatives and other documentary data was conducted. Later two data sets (ante-mortem and post-mortem evidence) were compared for clues to group and individual identification. During the field work, 44 pits containing from 1 to 154 skeletons were found. Thirty-two pits were found under a disturbed stone pavement, later identified as a former garage. Eight pits were outside the garage and formed a separate row. Five more small pits were found later

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at the northern end of the garage, approximately at the sites of former doors, where trees had subsequently been planted. In total, the remains of 720 males and 4 females were found. Their age ranged from 19 to 66 years. The position of the bodies in the pits clearly indicates their careless disposal. The overwhelming majority of the skulls of the deceased, 97%, had peri-mortal lesions. The lesions were caused by one bullet in 492 cases, two bullets in 110 cases, three bullets in 31 cases, four bullets in 13 cases, five bullets in 4 cases, and six bullets in 1 case. The caliber of the bullets varied from 5.6 to 9.0 mm, corresponding to evidence that different hand guns were used for the executions. In the majority of cases, bullets had entered the occipital area (more often to the left side), the exit site of the bullet being in the frontal area or face, thus proving that the victims were shot from behind (Fig. 7). Multiple shots and bullets impacted in the skull vault also prove the use of control shots when the body was lying on the concrete floor of the execution room.

Fig. 7. Bullet entrance (a - occipital bone) and exit (b - frontal bone) wounds in a skull from the Tuskulėnai mass grave: an example of a typical injury due to execution.

Different kinds of skull lesions were also documented; 118 were made with a blunt instrument, 106 were stabbed, and 4 were cut or struck. The majority of stab wounds were performed with four-edged instruments (possibly the bayonet of the Mosin rifle) (Fig. 8). In six cases, quadrangular 3x3 cm entrance and 0.5x0.5 cm exit holes were found in the skulls, proving that a bayonet had been used on the prone victim. Archival data indicates that executions were performed subsequently by two execution squads (Vasilij Dolgirev operated from 1944–1946, and Boris Prikazchikov from 1946–1947), and peri-mortem trauma varied over time and between security personnel in the Tuskulėnai case, e.g., there is a higher frequency of stab wounds in the victims of the Prikazchikov squad [17].

KGB files of executed persons contained information about age, sex, and approximate stature. Often descriptions of faces were given in files, but this

Fig. 8. Quadrangular opening (sign of bayonet stab?) in skull vault.

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information was inaccurate and not very informative for further identification. The most important information from the files was the photographs of victims, the dates of executions, and the number of executed persons. Some additional photos and descriptions were received from relatives of victims.

Initial comparison of execution details (periodic executions of several persons, sometimes up to two dozen each night, with intervals between executions from several days to 2–3 weeks) and numbers of individuals per pit was the basis of the working hypothesis for subsequent systematic identification. It was suggested that the bodies from one execution were transported for burial simultaneously and people executed on one night could be in one pit. During the cross-matching of data from reports of executions (number of executed persons and their group and individual identification traits) and numbers of bodies with their traits that could be significant for identification in particular pits, important details of the deposition of bodies were elucidated. It became evident that individuals executed in the late autumn/winter/early spring of 1944–45, 1945–46 and 1946–47 were buried in the garage (later demolished), as the ground there was less frozen and easier to dig in the cold period of the year. Among the KGB files, a letter was found complaining about burial difficulties in winter. The construction of the burial pits proves that the executions were planned; some were up to 4 m deep with wooden supports, and the bodies were stacked neatly in several layers separated by tar paper. According to this system, individuals executed in the summer of 1945 were buried outside: in the summer of 1995 a separate row of eight pits was discovered. It is notable that the bodies in these pits were covered with corrosive disinfecting chemicals.

The next step in the process of identification was the selection of potential individuals for further identification. The main method was video skull/portrait superimposition. During the cross-matching of individual data from KGB files and video superimposition results, over 60 individuals were identified.

Finally, the remains were transported to a specially built memorial mausoleum and placed in separate numbered caskets. This mausoleum was officially opened in November 2004. Further identifications are being performed by official request, and the potential number of identifiable individuals is likely to increase. Successful identification is now being enabled by the progress of technology, especially the use of DNA analysis. In 2007 one victim was identified by DNA examination: it was established that the individual assigned to case 203 was the father of two persons (brother and sister), with a probability of 99.97% and 99.91%. A control sample provided a definite negative result [8, 18].

The Rietavas site

During regular archaeological excavations in September 2010, a collective grave was found in Rietavas (a small town in western Lithuania). The disorderly position of the bodies and associated artefacts indicated that this could be a clandestine anti-Soviet guerrilla grave: it was routine practice for the KGB authorities to dispose of bodies in such a manner (often dumping them in refuse pits, etc.) (Fig. 9). Further excavation was performed under the supervision of the local police, and the remains were transported to

Fig. 9. Position of bodies found in Rietavas case.

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the Forensic Medicine Service. Forensic analysis revealed that the remains were of one female and four males, their ages ranging from 20 to 45 years, all of them containing bullet wounds. Two showed traces of bullets entering under the chin and leaving the skulls in skull vaults, evidently suicide shots (Fig.10). This information was reported to the State Genocide and Resistance Research Centre of Lithuania, and archival research suggested that this grave might be the result of a special operation performed on January 26, 1952, when five guerrillas were eliminated: group identification traits closely corresponded with individual data indicated in the report of the Soviet NKVD/MGB. Photographs of three individuals were obtained from relatives, and skull–portrait superimpositions resulted in a complete match, thus confirming the identity of all three persons. A decision about the identity of the remaining two was made on the basis of age differences (one of them was 21 and another 40 years old at the time of death). Regretfully, attempts at identification using DNA analysis failed due to the degradation of the DNA. The abovementioned identifications helped to perform a complete reconstruction of the events that took place that day. A total of 400 Soviet soldiers and militiamen were involved; after surrounding the hiding place in the woods, combat took place for several hours, and apparently the last two remaining guerrillas chose suicide instead of surrender. This served as a good example of formal and informal collaboration between various institutions [19]. The remains were returned for official burial.

The Zervynos site

In this case, the State Genocide and Resistance Research Centre of Lithuania initiated work in a forest close to the village of Zervynos in southeast Lithuania. According to documents in their disposition, a secret group of special agents and MGB soldiers reached the bunker where four guerrillas were hiding on May 20, 1952. Hand grenades were thrown into the underground bunker, and a fire broke out, but there was retaliatory shooting from the hideout. After a brief firefight, the bunker was completely burned, and the bodies were buried on the site. In the summer of 2012, a planned archaeological investigation took place. The site of the bunker was completely excavated, but no human remains were found except for a few charred fragments (later identified as fragments of the distal end of a tibia, the talus, etc.). The surroundings of the area were searched, and a shallow pit was noted. In this pit, highly disturbed fragmentary human remains were found (the disturbance apparently being caused by wild animals). The remains were submitted by local police to the Forensic Medicine Service for routine examination. Analysis revealed fragments of four males from 20 to 30 years of age with multiple lesions, some of which could be peri-mortem: one bullet wound on the skull vault, one penetrating bullet wound on the upper thoracic vertebrae, one blunt blow into the left angle of the mandible. However, the majority of cracks and fractures could have been post-mortem, caused by repeated freezing and unfreezing, when the remains were deposited close to the surface. Thus, the data from the forensic anthropological analysis concurred with archival data as to the circumstances of the event. Attempts at individual identification were made. Due to the extreme fragmentation of the skulls, no skull–portrait superimpositions were performed (the portraits of two individuals were available). However, DNA identification was partially successful. Four skeletal samples (two from skull fragments and two from femurs) were taken for DNA extraction using standard procedures, and mouth mucosa samples were obtained from two sisters of individuals that supposedly died

Fig. 10. Bullet entrance (a - skull base) and exit (b - Lambda area) wounds on a skull from the Rietavas case: evidence of suicide.

in this episode. A DNA sample from one femur revealed a 65.8% match of alleles analyzed with the sample of one of the females, and it was concluded that indeed one of the individuals might be the brother of one of the DNA donors. Regrettably, DNA profiles from the remaining bone fragments were either not extracted or were insufficient for identification. In summary, on the basis of all evidence and laboratory tests it was finally concluded that the skeletal fragments of the four males found in the forest near Zervynos were

indeed the remains of the four guerrillas who died on May 20, 1952, and their remains were returned for official burial.

The Dusetos case

Another case could be an example of the rejection of hypotheses about post-war inhumations. The State Genocide and Resistance Research Centre of Lithuania received requests based on oral evidence that guerrillas and their supporters were secretly inhumed in the vicinity of the former local Soviet militia headquarters in Dusetos (eastern Lithuania). Archaeological excavation on the site began in the autumn of 2012. The remains of four individuals in unconventional burial positions, some of them disturbed during former earthworks, were found with no associated artefacts. However, artefacts found in the soil above the remains were suggestive of deposits from the 17th–18th centuries. The remains were submitted to the Forensic Medicine Service for further investigation. Analysis revealed that the skeletons were of two males and two females from 20 to 50 years of age. The skeletons were heavily eroded post-mortem due to acidic soil, but no peri-mortal lesions were detected. Moreover, the heavy dental wear of all individuals appeared to be characteristic of Late Medieval–Early Modern populations of Lithuania [20] and not the mid-20th century. Based on this evidence, the conclusion was drawn that the burials were at least 100 or possibly 200 or more years old, and the case was closed.

All these cases demonstrated the usefulness of the application of archaeological methods, as they supplied valuable information that was used for identification. As the literature indicates, details of the execution and disposal of bodies were solid evidence of the attempts of those performing these systematic killings to dehumanize their victims, to purposely destroy evidence, to deny responsibility [21], and to bury the social memory of violence, in this way strengthening regimes based on terror [22]. The resolution of these cases served to provide historic justice. The experiences gained during these case studies provided the framework for more efficient subsequent searches, exhumations and identifications [23].

CONCLUSIONS

The close collaboration of experts from various fields (legal institutions, forensic medicine and archaeology, and professional archaeologists from museums and universities) in all stages of investigation is essential in the process of identifying historical and legal cases. Many of these cases attracted great interest from the mass media and general public, although the value of archaeology was not always emphasized. However, our experience revealed practical problems in the implementation of forensic archaeology that might be valid for other countries as well. In general, it is not an easy task due to the interdisciplinary character of the field, since very different authorities (medical, legal, academia) with sometimes different expectations are involved. Very often such work is performed on the basis of informal (horizontal) contacts and initiatives. Missing feedback, especially from legal institutions, can be an obstacle in the improvement of methodologies. Insufficient workload plus limited resources, especially valid for small countries, can lead to loss of skills and difficulties in obtaining new technologies, which in turn could lead to unreliable results, further causing neglect by authorities. One can hope that such examples will raise local police awareness of the potential of forensic archaeology in the investigation of modern crimes as well.

REFERENCES

[1] Garmus A., Jankauskas R. and Urbanavičius V., Prospects of Lithuanian forensic anthropology. *Acta Medica Lituanica,* 1999, 6(3), 238–241

[2] Markulis J., Teismo medicinos tarnybos raida Lietuvoje (1795–1965), Unpublished PhD thesis, Vilnius University, Vilnius, Lithuania, 1966, (in Lithuanian)

[3] Nainys J.V., Identifikacija ličnosti po proksimalnym kostiam konečnostei, Mokslas, Vilnius, 1972, (in Russian)

[4] Doveika K., Korsakas K. (eds.), Kristijono Donelaičio palaikų tyrinėjimo medžiaga, Mokslas, Vilnius, 1981, (in Lithuanian)

[5] Garmus A., Opredelenije pola po metričeskim priznakam kostej goleni, Sudebno-medicinskaja ekspertiza, 1974, 26(2), 8–10, (in Russian)

[6] Garmus A., Problems of the person's identification from pelvic bones, Medicina Legalis Baltica, 1992, 1–2, 22–29

[7] Nainys J.V., Anusevičienė O.V., Nekotoryje anatomo-antropologičeskije osobennosti kostej predplečja, Archiv anatomii, gistologii i embriologii, 1984, 86(3), 60–68, (in Russian)

[8] Jankauskas R., Forensic anthropology and mortuary archaeology in Lithuania, Anthropologischer Anzeiger 2009, 67(4), 391–405

[9] Kuncevičius A., Jankauskas R., Laužikas R., Stankevičiūtė D., Rutkauskaitė I., Radvilų tėvonija Dubingiuose, Vilniaus dailės akademijos leidykla, Vilnius, 2009 (in Lithuanian)

[10] Jankauskas R., Kozakaitė J., Kisielius G., Miliauskienė Ž., Jankauskienė J., Gedimino kalne rastų 1863-1864 metų sukilėlių palaikų identifikavimas In: 1863–1864 metų sukilėlių kelias į mirtį ir atgimimą, Tamara Bairašauskaitė (ed.), Lietuvos nacionalinis muziejus. Vilnius, 2019, 168–183 (in Lithuanian)

[11] Martos R.; Ibáñez O.; Valsecchi A; Bermejo E.; Navarro F.; Kisielius G.; Jankauskas R., Identificación de los líderes rebeldes ejecutados durante el levantamiento polaco-lituano contra el Imperio Ruso de 1863–64 mediante superposición craneofacial usando Skeleton-ID = Identification of the rebel leaders executed during the Polish-Lithuanian uprising against the Russian empire of 1863-64 by craniofacial superimposition using skeleton-ID. // Revista Internacional de Antropología y Odontología Forense = International journal of forensic anthropology and odontology. Verín: Asociación Española de Antropología y Odontología Forense, 2020, vol. 3, no. 2, 42–70, ISSN 2603-6797 (in Spanish)

[12] Signoli M., Ardagna Y., Adalian P., Devriendt W., Lalys L., Rigeade C. et al., Discovery of a mass grave of Napoleonic period in Lithuania (1812, Vilnius). *COMPTES RENDUS PALEVOL* 3, 2004, 219–227

[13] Adalian P., Signoli M., Lalys L., Ardagna Y., Piercecchi-Marti M.-D., Dutour O., Léonetti G. Intérêts de la présence d'une équipe spécialisée pour la levée de corps en anthropologie médico-légale, *Journal de Médecine Légale, Droit Médical, Victimologie, Dommage Corporel* 45, 2002, 375–377.

[14] Jankauskas R., Miliauskienė Ž., Stankevičiūtė D., Kuncevičius A., Im Osten etwas Neues: Anthropological analysis of remains of German soldiers from 1915-1918, *Anthropologischer Anzeiger* 68(4), 2011, 393–414

[15] Čičiurkaitė I., Kraniauskas R., Mass graves of WW2 prisoners of war, 2022, (in this issue)

[16] Kuodytė D., Tracevskis R., The Unknown War. Armed anti-Soviet Resistance in Lithuania in 1944–1953, Genocide and Resistance Research Centre of Lithuania, Vilnius, 2004

[17] Bird C. E., State-Sponsored Violence in the Soviet Union: Skeletal Trauma and Burial Organization in a Post-World War II Lithuanian Sample, PhD Thesis, Michigan State University, USA, 2013

[18] Jankauskas R., Barkus A., Urbanavičius V., Garmus A., Forensic archaeology in Lithuania: the Tuskulėnai mass grave, *Acta medica Lituanica,* 2005, 12(1), 70–74

[19] Žygelis D. Sugrįžę iš nebūties: partizanų palaikų identifikavimas, *Genocidas ir rezistencija*, 2012, vol. 1(31), 198–203 (in Lithuanian)

[20] Miliauskienė Ž., Jankauskas R., Dental wear patterns in Lithuanian and Latvian palaeoanthropological samples, *Archaeologia Baltica*, 2009, 12, 88–94

[21] Komar D., Patterns of Mortuary Practice Associated with Genocide, *Current Anthropology,* 2008, 49(1), 123–133

[22] Ferrándiz F., The return of Civil War ghosts, *Anthropology Today*, 2006, 22(3), 7–12

[23] Kozakaitė J., Forest Brothers - the search and identification of the participants of 1944–1953 anti-Soviet resistance, 2022, (in this issue)