

CONSERVATION AND REASSESSMENT OF AN OVERLOOKED SKELETAL COLLECTION PRESERVED SINCE 1901 AT THE MUSEUM OF ANTHROPOLOGY “G. SERGI”, ROME

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1. Introduction

This paper is to inform the archaeological and historical research community of the re-discovery of a poorly documented, but scientifically important, skeletal collection composed of 19 skulls and mandibles, housed at the Museum of Anthropology “Giuseppe Sergi” (MGS) of the Sapienza University of Rome, Italy.

This collection comes from a Longobard cemetery found near the small town of Castel Trosino, in central Italy (Figure 1). The configuration of this collection bears testimony to the old tradition (end of the 19th and beginning of the 20th century) in anthropology of amassing cranial collections from sites around the world. Our initial purpose for investigating this collection of skulls is assessment, so they become available for future research. In doing so, we discuss both conservation efforts (locating archival documents) and basic reassessment of the preliminary osteo-archaeological data specific to this collection. This is vital since osteological standards for doing so have changed considerably since the skulls were first housed and documented at the MGS 110 years ago.

The aim of this paper is therefore twofold: i) to make a reassessment of the skull collection, with related information (sex, age, presence of lesions); ii) to provide information in light of more specialized analyses (biomolecular investigations; paleopathology: CT-scans or X-rays for virtual anthropology studies; ancient DNA analysis).

1.1. Archaeological context

The history of the recovery and the storage of these remains begins with the discovery of a single richly endowed Longobard burial in 1872. This archaeological find then prompted the first formal field research, during the period 1893-96, of the now well-known necropolis of Castel Trosino [1].

The funerary area of this site from the Early Middle Ages is subdivided into three *contrade*, referred to as Santo Stefano, Fonte and Campo. Castel Trosino stands out

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among early Longobard cemeteries in Italy for its significant number of burials and for the wealth of the material grave goods [2 - 4]. The cemetery is also divided into four chronological periods that match consecutive Longobard generations [5]. The archaeological records tell us that there were 289 burials recovered from the site, with 20 of the graves designated as warrior burials. Of the warrior burials, 2 or 3 important individuals from each generation were found with complete and/or prestigious battle gear. Other warriors were buried with less prestigious and incomplete equipment [1, 5]. Recent interpretation of the site suggests that the nearby settlement had no pre-eminent military function. Rather, it was more likely used as a residence for the families of important warriors. This hegemony was underlined by the exceptional quality of the male and female grave goods [5].



Figure 1. Necropolis of Castel Trosino, contrada Santo Stefano, Ascoli Piceno (Ricci & Paroli, 2007). Burials in red are where the skulls preserved in Rome come from.

Unfortunately, most of the 289 burials recovered in the original excavations have been misplaced and have not been osteologically assessed [1]. This lack of documentation makes the remaining 19 skulls preserved at the MGS an important collection for understanding the osteobiography and life history of this population.

As for the cultural context of the skulls, the grave goods found in this necropolis are now part of the artefacts displayed at the “Museo delle Civiltà - Museo dell’alto Medioevo Alessandra Vaccaro” in Rome, Italy. These goods have been well studied and are available for public viewing [1]. However, given this archaeological evidence, we understand that the 19 skulls discussed in this paper represent burials where either no grave goods were found, or the grave goods were of very poor quality. Additionally, their burial location in the necropolis and their tomb typologies (Table 1) suggest that these individuals were likely of low social status [6, 1].

2. Materials and Methods

2.1. History of the collection

Professor Giuseppe Sergi was considered one of the forefathers of the discipline of anthropology in Italy during the second half of the 19th century. As part of his critical contribution to the discipline, in 1889 he started collecting human osteological samples from around the world. Most of these collections are currently housed in the MGS located in the Department of Environmental Biology of the Sapienza University of Rome [7]. In the early years of the MGS, thousands of osteological samples (mostly crania) were acquired by or donated to Giuseppe Sergi. As the collections grew, Sergi required a more adequate place to house these materials. As a result, he set up the first room for storing osteological samples in the chapel of the “San Pietro in Vincoli” Church, at the Regia Scuola di Applicazione per Ingegneri (School of Engineering) [8]. In 1887, the collections were moved to the ground floor of the Palazzo del Collegio Romano, a research institution located in Rome, referred to as the “Gabinetto e Museo di Antropologia” (later Istituto di Antropologia), pertaining to the Faculty of Sciences of the Università di Roma “La Sapienza”. The collections were housed there for nearly 50 years. Later a permanent dedicated space was created in 1938 to house the collections in the new building of Anthropology, Psychology and General Physiology. This was to be an anthropological institute and museum built specifically for the new campus of the Sapienza University of Rome, known also as “Studium Urbis” [8]. The human osteological collections have been stored there ever since and is where the 19 skulls from the site of Castel Trosino were found.

In addition to the actual skeletal elements housed at the MGS, the museum holds the archival records specifying how the collections were obtained and/or purchased as well as the archaeological records for many of the sites. Among the archival documents, we found the receipt for the acquisition of the 19 skulls from the excavators who recovered the bones from the Castel Trosino site. The document is dated May 20th, 1904 (Figure 2). It states the following: “Crani antichi longobardi, 19” paid “475,00 lire”

Contabile e stampa della Regia Università di Roma 27 agosto 1903, n. 41.

AMMINISTRAZIONE d

Provincia di _____ Ufficio di _____

N. 399 d'ordine Add. 20. ✓ 1904

Buono per sig. (1)
per (2)
dei seguenti oggetti:

OGGETTO	CATEGORIA	VALORE da notarsi nel registro d'entrata e d'uscita
195 Crani antichi longobardi 19	2-1	475,00
196 Crani di Biadmon	1	20,00
197 Crani antichi di Borty	1	50,00
198 " " " " " "	1	20,00
199 Crani di Dolgyn	1	20,00
200 Crani del Senon	1	120,00
201 Crani di Castel Trosino	5-8	290,00
202 Crani epici antici	1	15,00
203 Crani di Felini	1	40,00
204 Crani di Ostia antica	11	550,00
205 Crani greci di Felini	4	320,00

(3) *Luigi Livi* 1904

(1) Nome, cognome, qualità e residenza del Consegretario.
(2) Introduzione, estrazione, riparazione.
(3) Cognome, nome e qualità del Capo dell'Istituto.
(4) Aggiungere a mano - ricevuto o consegnato - a seconda dei casi.
(5) Il Consegretario o il liceante.

Figure 2. Receipt dated 1904 for the purchase of the skulls from Castel Trosino (in the red rectangle: “Crani antichi Longobardi 19”, “19 ancient Longobard skulls”) preserved in the archives of the Museum of Anthropology of the Sapienza University of Rome.

(1,663 euros current value) for their acquisition. From these documents, it appears that of the 289 burials excavated at the Castel Trosino site, only the 19 skulls were housed at the MGS. Unfortunately, the archival records of the MGS have no documents that tell us of the fate of the other burials. As an early physical anthropological researcher, Sergi published the first osteological documents concerning this sample; in them, he described the 19 crania and some mandibles and determined the sex of each skull. The primary purpose of his 1902 report was to comment on cranial size and shape as well as endocranial volume specific to sex [9 - 10]. Even if the long bones are missing, the skulls have been stored, as we know, at the MGS since 1901. Nevertheless, this document is of historic interest as it provides evidence that Sergi's research was at the time following goals which were common among physical anthropologists in the 19th century. It also appears that his work was in response to previous studies conducted by Morton and Broca [11] in their attempt to better understand human "racial" variation and cognition.

After Sergi's report it seems that nothing else was written about the remains until 1971. This was shortly after Prof. Istvan Kiszely visited the MGS. During this visit, he found that 13 of the 19 skulls were still in the original wrapping paper with the number of the burial written on the paper [6]. During his research at MGS, Kiszely created a photo-log specific to eight of the skulls from the Castel Trosino collection. This photo-log with descriptive tables was sent to Prof. Venerando Correnti who, at that time, was the director of the Institute of Anthropology of the University of Rome (Figure 3). We assume that the letter contained results from an osteological study carried out by Kiszely sometime just before 1969 (Figure 4). This correspondence was from Kiszely while he was in Budapest and was likely mailed with the intent of wishing to publish his research of the skulls in an Italian journal. Before commenting on Kiszely's research, Correnti contacted Prof. Mario Cappieri (professor of Anthropology in Rome) for a second opinion on the manuscript. It would therefore appear that Correnti sent a copy of the letter to Cappieri, but he evidently did not send the photo-log made by Kiszely, which means the photo-log remained in the archival records of the MGS.



Figure 3. The envelope sent to V. Correnti in 1969 from the Institut Archeologique De l'Académie Hongroise de Science, Budapest.

Also, despite his inquiry concerning publishing his findings in an Italian journal, it appears that Kiszely did not do so. Instead Kiszely published his findings in an issue of the British Archaeological Reports [1, 12]. His work produced additional, previously unreported descriptive metric data of the skulls recovered from the Castel Trosino site. However, we found nothing reported by Kiszely concerning cranial trauma or skeletal lesions.

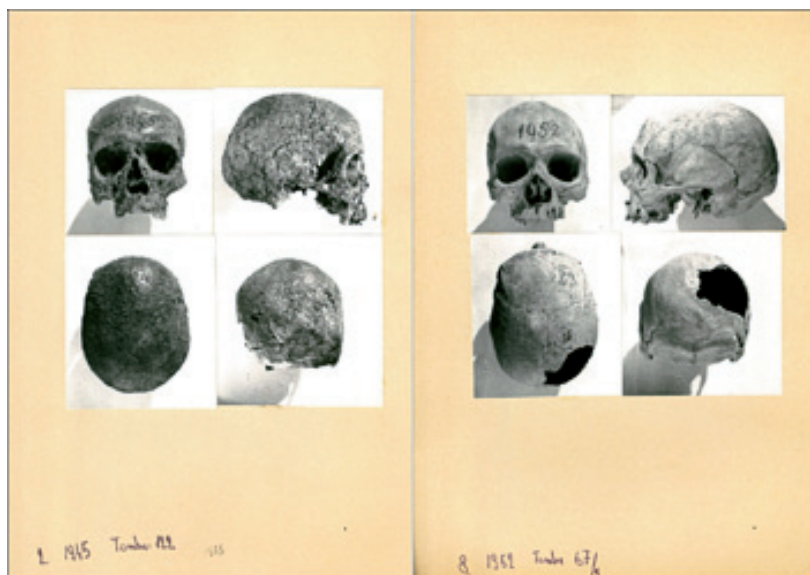


Figure 4. Part of the photo-log sent to Correnti from Kiszely and preserved in the Museum G. Sergi.

2.2. Current assignment of the skulls

A re-introduction of the 19 Castel Trosino skulls to Longobard historians is the specific aim of the present publication. The significance of this small sample cannot be overstated. They are the only known remaining skeletal elements from the original excavation of 1893-96 and represent everyday common individuals from the necropolis in *contrada* Santo Stefano (Figure 1). As part of an under-reported Italian community, the skulls have become a critical source of biological data. Recent publications on other Longobard collections are deepening our knowledge about their mobility, lifestyle, state of health and cultural/medical methods for treating serious health problems [13 - 21]. Additional metric and health data from this collection should help to better understand this early-medieval Italian community.

The state of conservation of the cranial samples varies, as can be seen in Table 1. Since all of the remains were excavated before the 1900s, there was little control over the quality of the excavation procedures. In archaeological excavations of the last century, it was common for only skulls and some long bones to be kept for potential laboratory assessment. The rest of the remains were often left at the site, lost to biological anthropologists and to historians.

Table 1. Sex and age distribution of the skulls from Castel Trosino with preliminary palaeopathological observations

<i>Specimen</i>	<i>Burial</i>	<i>Sex</i>	<i>Age</i>	<i>Bones</i>	<i>Location</i>	<i>Type of burial</i>	<i>Grave goods</i>	<i>Palaeopathological lesions</i>
CT1944 ¹	56a	F	25-35	Cranium	Inside the church	Multiple chamber tomb	Absent	Possible sharp trauma on the occipital
CT1945 ¹	122	F	20-25	Cranium	North-eastern area	Chamber tomb	Comb and two hair pins	None
CT1946 ¹	56b	M	50+	Cranium	Inside the church	Multiple chamber tomb	Absent	Edentulous
CT1947 ¹		M	25-35	Cranium Mandible				Sharp trauma on right parietal, enamel hypoplasia
CT1948 ¹		F	adult	Cranium				None
CT1949 ¹		M	35-40	Cranium				None
CT1950	72	F	35-45	Cranium	Close to the church	Chamber tomb	Bronze brooch and plaque	Lithic lesions on the sphenoid, porotic hyperostosis, tooth loss (all molars were lost during life)
CT1951	49	M	30-40	Cranium Mandible	Inside the church	Chamber tomb	Iron brooch, comb and glass bottle	None
CT1952	67a	M	55+	Cranium	Inside the church		Bronze brooch, comb and gold filaments	Fracture of nasal bones, destructive caries on second molar of right maxilla, possible scurvy
CT1953	67b	F	50+	Cranium	Inside the church	Multiple chamber tomb	Brooch, comb and gold filaments	A trepanation with a cross-shaped lesion, 2 small osteoma buttons
CT1954		M	55+	Calvarium				None

CT1955	110	F	24-35	Calva-rium	Central area at south	Burial in soil with stone covering of floor and walls	Absent	Porotic hyperostosis
CT1956		F	50+	Cranium				DJD on temporo-mandibular joint and on occipital condyles
CT1957	81	F	55+	Calva-rium	Central area at south	Burial in soil with stone covering of walls	Absent	None
CT1958		F	25-30	Facial bones, Mandi-ble				DJD on mandible condyles
CT1959	56	M	25-35	Calva-rium	Inside the church	Multiple chamber tomb	Absent	Healed fractures on the mandible (body and right ramus), DJD on temporo-mandibular joint, calculus on right teeth (maxilla and mandibula)
CT1960	28	F	20-30	Calvarium, Mandible	Central area	Burial in soil	Absent	None
CT1961	130	M	35-50	Calvarium	North-eastern area	Burial in soil	Absent	DJD on temporo-mandibular joint
CT1962	39	F	25-35	Cranium, mandible	Central area	Burial in soil	Pitcher	Enamel hypoplasia, DJD on temporo-mandibular joint

(These specimens were covered by a layer of glue, see Figure 3A. The mean age for this collection is 36 years. F = female; M = male; DJD = degenerative joint disease).

2.3. Re-assessment of the collection

A new audit enquiry was initiated to re-assess the biological profile of the specimens from Castel Trosino. Our assessment included a confirmation of the sex identification made by Sergi [10], while providing an estimation of age at death and general health conditions for each cranium and mandible. In his 1902 report, Sergi did not offer age estimation because methods estimating skull age were not widely available. We are also in the process of evaluating the available skeletal material for both trauma injuries specific to violent activities and lesions related to metabolic health problems.

Current isotopic investigations will also shed light on the geochemical provenance of the skeletal material as well as providing an indication of their dietary habits.

Re-assessment of the collection has allowed us to increase our knowledge of the collection. Age estimation was performed for each skull following two criteria, anterior-lateral suture closure rate [22] and dental enamel wear pattern [23]. Both methods are commonly used by human osteologists to create demographic profiles from skulls. The first method describes how to score age-at-death using the anterior-lateral sutures and judging the degree by which the sutures in this region of the skull have closed over time. This method takes into account 5 points along the sutures of this region of the skull. Each point is assigned a score specific to the degree of cranial suture closure (0= unclosed, 1= <50% closed, 2 >50% closed, 3= fused). Each score corresponds to a state of suture closure/fusion. The scores are then summed up to obtain a composite score that is used to determine an estimated age [22]. Another method to assess age for these skulls and mandibles is based on occlusal dental wear rate, which estimates age at death [24, 25]. After complete eruption of the tooth, the occlusal surface of the enamel starts to wear away. The biomechanics of chewing and diet, as well as tooth morphology and developmental sequences influence the patterns and the amount of wear [23].

3. Results and Discussion

Our re-evaluation adds age estimation (Table 1, unpublished data) to the sex identification provided by Sergi [10]. Our investigation on age at death was carried out by calculating the average of ages obtained by the two methods. From our analysis, we found that all the specimens are adults between the ages of 20 and 55 years (Table 1). The female mean age is 33.8 years and the mean male age is 40 years at death. Age range for females is 20-55 years, while for males it is 25-55 years. In Table 1 we also report on the specific location of the skeletal elements, as emerged from the records housed at the MGS, while also including our primary palaeopathological impressions of the skulls as an indication of the enormous potential of this collection. The age at death is subdivided into three age groups [26]: young adult (20-34), mature adult (35-49), old adult (50+). The one individual labelled as "adult", exhibits age-related features that are insufficient to suggest a specific age range.

Kiszely was able to record the excavation number of the burials in 13 cases. None of the identified burials presented rich grave goods except for the brooch from burial 49, which shows traces of a damascened decoration, a typical Longobard motif found on metal objects [27]. Sixty-three percent of the skulls (12 out of 19) represented, show some form of pathological bone defect. One of them shows traumatic lesions. These lesions suggest inter-personal violence among the Longobard people buried in Castel Trosino. An additional third of the skulls exhibit signs of degenerative joint disease (DJD) linked to age. The rest of the palaeopathological individuals present bony defects associated with dietary or infectious origins. They include porotic hyperostosis and pitting of the sphenoid and maxillary regions [28]. Finally, one female shows a unique pattern of scraping trepanation in a cross-shape. The presence of these lesions and their active remodelling testifies to the fact that these individuals survived chronic health problems [29]. Specifically, one male with a broken and healed mandible, as well as the female with the trepanation, show that local or family healers with medical skills were active in this community. In the first

case, the man survived a trauma that had caused a substantial loss of blood; the mandible fractured and then healed with minimal issues of infection. The trepanation case confirms that the Longobards were involved in advanced care [30], as observed in cases from other necropolises. Indeed, knowledge of medical treatment among the Longobards is not only known through written sources¹, but also through archaeological records².

The 19 skulls illustrate how the Longobards provided care for chronic and severely-acutely ill individuals, attesting to their sense of community and high value for human life. With the aim of gathering more information about the community, our goal is to extend the network of data about osteobiography and medical knowledge by investigating disability and care in the Early Middle Ages.

4. Final remarks

Regrettably, until recently, the skeletal collection of the Early Middle Ages from the site of Castel Trosino has not received adequate attention and very little has been determined about its demographics, dietary history and state of health. However, we have begun to systematically correct this oversight by managing the collection and facilitating future research. More specifically, the collection housed in the MGS is now part of a series of Italian skeletal specimens that are the foundation of a project entitled: "Population biology, diseases and mobility: Romans and Longobards in the post-classical era", funded by the Sapienza University of Rome.

The contribution of this proposed investigation will be far-reaching.

Despite the fact that only 19 skulls from the original excavations at Castel Trosino have been conserved, they offer us a critical starting point towards studying the health of the Longobard community that lived there. It will moreover be important to investigate the frequency of pathological conditions in the crania and mandibles. As with other Longobard collections, we hope to expand our knowledge of the complex medical world by studying and examining both the indirect archaeological and direct biological evidence recovered from the burial sites. Understanding what skeletal lesions can tell us may help in interpreting the range of difficulties faced by these people from the Early Middle Ages.

Nevertheless, interpreting the presence or absence of skeletal defects among human finds from burials can be problematic. This is well understood by human osteologists. If lesions are found, do they represent chronic or acute health problems? If bone defects are in the process of being healed, what does this mean in terms of treatment? These questions are associated with the complex theoretical issue as described in "The Osteological Paradox" [29], which discusses the problem related to the interpretation of lesions and their origins among past human populations. The research goal of understanding these issues can only be accomplished using historical records combined with both the archaeological and bioarchaeological evidence recovered from the site. It is evidently clear that it is not enough to simply record lesion frequencies from a skeletal collection, it is also necessary to contextualize all defects or report on their absence. Lesion frequencies alone do not tell us how past communities lived and worked together to extend life (maybe even to enrich life). To do this, the osteobiographical data must be placed in the cultural context from which it came. This can only be done with intentional sharing of information by historians, archaeologists and human osteologists as they attempt to understand the importance of the records recov-

ered from human burials of past peoples. Bones offer direct evidence of the life history of a person, while biographies, buildings and ruins, pottery and stone or metal tools are secondary, indirect indicators of how individuals lived³. With this in mind, the present research illustrates the unquestionable advantage of reassessing skeletal samples that have not been fully studied or that need to be reassessed with current and improved methods. Despite the small number of individuals, the cranial collection from Castel Trosino is now accessible for future studies and full of research potential, which is precisely the goal of this paper. Along with available historic archival documents and the material culture from the archaeological context, the small sample of skulls should be considered a collection of international significance as we attempt to better understand how Europeans in the Early Middle Ages coped with the complex issues associated with mobility, health, medical treatment, and the community context in which these critical life-saving social interactions happened.

This skull collection is now ready to undergo further study and so far, represents the only osteological resource that can help us increase our knowledge of the Longobard population buried at Castel Trosino.

Notes

¹. The following example is one of the passages in Early Middle Ages literature about the presence of doctors in the communities: Pauli Diaconi, *Historia Langobardorum*, liber V, cap. 33. "But Grimoaldo, nine days after a phlebotomy, while he was in his palace, took the bow and trying to hit a dove with an arrow, broke a vein of the arm. The doctors, as it is said, applied poisonous medicines to him, so they completely took away this light from him", translated following the Italian version of Pauli Diaconi, *Historia Langobardorum*, ed. A Zanella (Milano: BUR, classici greci e latini, 2015).

². An example from the archaeological record is the discovery of three hernial belts at three different Longobard necropolises in the North of Italy, De Marchi, P.M. (2006) *Manufatti medici in contesti funerari: i cinti erniari. dalla diagnosi alla produzione*. In R. Francovich, M. Valenti (eds) *IV Congresso Nazionale di Archeologia Medievale. Pré-tirages, Scriptorium dell'Abbazia. Abbazia di San Galgano, Chiusdino – Siena, 26-30 settembre 2006*, Firenze: All'insegna del Giglio, pp. 440-4406. This supports how the knowledge of medical solutions was quite specific.

³. A recent example of how much information an osteological investigation can offer is in Robb, J., Inskip, S. A., Cessford, C., Dittmar, J., Kivisild, T., Mitchell, P. D., Mudler, B., O'Connell, T. Price, M. E., Rose, A., Scheib, C. (2019) *Osteobiography: The History of the Body as Real Bottom-Line History*, *Bioarchaeology International*, 3(1), pp. 16-31.

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Biographical notes

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Robert R. Paine received his undergraduate degree in Anthropology from the University of Massachusetts – Amherst, in 1981. His Master's degree in Anthropology comes from the University of Missouri – Columbia, where he focused on bone biology and skeletal histology of autopsy samples. He received a Ph.D. in Anthropology from the University of Massachusetts – Amherst, in 1994. He has been a member of the American Academy of Forensic Sciences (retired). He has also spent considerable time studying human health trends from proto-historic and historic remains from Cyprus, Italy, Turkey and South Africa. As an educator, he created and directed a forensic anthropology concentration undergraduate degree, and an undergraduate forensic sciences minor degree. From 2018-20, he has held a visiting research appointment at the University of Rome (Sapienza).

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Giorgio Manzi is full professor of Anthropology (Bio/08) at the Sapienza University of Rome, Department of Environmental Sciences, where he is also Director of the Museum of Anthropology 'G. Sergi'. Former Director of the Museum centre of Sapienza (2012-2018), former General Secretary of the Istituto Italiano di Paleontologia Umana (1999-2006), and Price F. Frassetto credited by the Accademia Nazionale dei Lincei (2006). He is the author of more than 150 scientific papers, mostly dealing with palaeo-anthropology, morphology and bioarchaeology (present h-index Scopus: 26); his professional expertise includes the interpretation of the fossil record of human evolution, studied with advanced morphological and morphometric analyses, and the skeletal biology of past human populations, particularly at prehistoric and historical transitions. He is also known for his activities as a science communicator.

Summary

The osteological investigation of archived and historic skeletal collections can often provide clues to how they were organised and managed, offering key osteobiographi-

cal insight into past populations. A small, yet significant, collection of skulls housed at the Museum “Giuseppe Sergi” of the Sapienza University of Rome, remained anonymous prior to a recent reassessment protocol started in 2018. This collection was excavated from a funerary area discovered during the 19th century from the site of Castel Trosino (Ascoli Piceno, Italy). The cemetery was part of an important community during the Longobard domination of Italy, as testified by the richness of the cultural artefacts reported with the burials. The 19 skulls presented in this paper are the only ones available for assessment; all the others were lost shortly after the first excavation. Their importance is related to providing a better understanding of biological evidence of a community that lived in Italy during the Early Middle Ages.

Riassunto

Attraverso la chiave di lettura osteobiografica, l'indagine di collezioni scheletriche storiche custodite presso Musei e Soprintendenze può fornire nuovi indizi per la loro storia degli studi. Una piccola ma significativa collezione di crani, ospitata presso il Museo “Giuseppe Sergi” della Sapienza Università di Roma, è rimasta anonima fino ad un recente protocollo di indagine iniziato nel 2018. Questa collezione fu recuperata dall'area funeraria scoperta nel corso del XIX secolo nel sito di Castel Trosino (Ascoli Piceno, Italia). Questo cimitero faceva parte di un'importante comunità durante il periodo della dominazione longobarda d'Italia, come testimoniato dalla ricchezza dei corredi recuperati. I 19 crani presentati in questo lavoro sono gli unici disponibili per lo studio, tutti gli altri sono andati persi poco dopo il primo scavo. La loro importanza è legata alla ricerca di una maggiore comprensione delle testimonianze osteologiche della comunità altomedievale di Castel Trosino.