

# Bones of Contention: Reflections on Osteoarchaeology and the Baltic Region

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**Abstract.** During the last decade, some of the most significant archaeological interpretations included the integrated use of scientific methods, including osteoarchaeology. The identification, analysis and interpretation of human and animal remains from archaeological sites has been developing along increasingly different trajectories, due to the different aspects of daily life the bones of animals and humans illustrate. This paper is a review of the position osteoarchaeological research has achieved since the 1960s, through the example of its beginnings in the mid-20<sup>th</sup> century in Sweden. Similarities and differences between the histories, contents of and directions in human and animal osteoarchaeology are reviewed, revealing some controversies in the ways the results of the discipline have been embraced by the broader archaeological community. Similarly to archaeological research, increasingly complex analytical methods help refining results obtained by traditional morphometric methods applied to bones. This trend will continue in the foreseeable future: scientific methods will keep on contributing to valuable insights into past societies. Special sections in the paper are devoted to the possibilities of disseminating the results of osteoarchaeology through formal and informal networks such as publications, teaching and conferences within the context of the Baltic region through the example of archaeozoological research.

**Keywords:** human osteoarchaeology, archaeozoology, environmental archaeology, Sweden, science in archaeology, research history.

Nesutarimai dėl kaulų.

Pamąstymai apie osteoarcheologiją ir Baltijos regioną

**Anotacija.** Pastarajame dešimtmetyje reikšmingiausios archeologų interpretacijos buvo atliekamos pasitelkiant mokslinius metodus, tarp kurių buvo ir osteoarcheologija. Archeologinėse vietovėse rastų gyvūnų ir žmonių liekanų identifikacija, analizė ir interpretacija buvo plėtojamos įvairiausiomis kryptimis, kurios iliustravo kasdienybę daugybe skirtingų aspektų, apie kuriuos gali papasakoti tikrai gyvūnų ir žmonių kaulai. Šioje publikacijoje, pasitelkus Švedijos pavyzdį, bus apžvelgiama, kaip nuo 1960 m. plėtojosi osteoarcheologiniai tyrimai. Skirtumai tarp gyvūnų ir žmonių osteoarcheologijos istorijos, turinio ir krypčių jau yra aptarti, buvo išskirti ir kai kurie diskusiniai klausimai bei nesutarimai, susiję su tuo, kaip gaunamus rezultatus naudoja archeologų bendruomenė.

Osteoarcheologijoje, kaip ir archeologijoje, gausėja analitinių metodų, todėl galima sužinoti daugiau, negu taikant vien tradicinius morfometrinius kaulų tyrimų metodus. Tokios tendencijos išliks ir ateityje, o moksliniai metodai toliau prisidės prie vertingų praeities bendruomenių gyvenimo išvalgų. Atskiros šio straipsnio skiltys yra skirtos archeozoologinių tyrimų pavyzdžiu parodyti, kaip, naudojantis įvairiausiai būdais – publikacijomis, mokymais, konferencijomis, galima skleisti osteoarcheologinių tyrimų rezultatus Baltijos regione.

**Reikšminiai žodžiai:** žmonių osteoarcheologija, archeozoologija, aplinkos archeologija, Švedija, archeologijos mokslas, tyrimų istorija.

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## Introduction

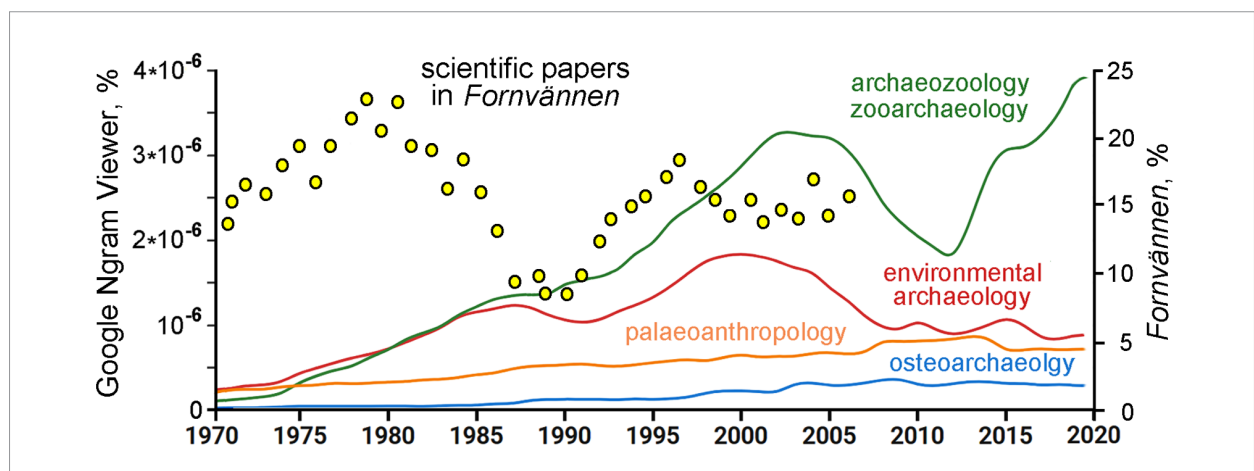
Archaeology should *ab ovo* be a transdisciplinary subject. In Scandinavia there has been exemplary cooperation between archaeology and the natural sciences as early as the mid-19<sup>th</sup> century (Forchhammer et al., 1851–1856), setting an example for osteoarchaeological studies across 20<sup>th</sup> century Europe (Bökönyi, 1992, 400). Since then, an ever increasing number of archaeological projects have been using data provided by the natural sciences, including new perspectives in the study of ancient humans and animals. In addition to the efforts of utilising bones in radiocarbon dating (Sellstedt et al., 1966), these organic remains have become indispensable in the reconstruction of early food production (archaeobotany, archaeozoology, sedimentology), food consumption (residue analysis, dietary isotope research), and human palaeodemography (ancient DNA, isotopes related to mobility).

Osteoarchaeology is the study of both animal and human remains from archaeological sites. Therefore, it falls within the disciplinary overlap between natural sciences and humanities as, in this case, osteological data form the basis of our archaeological interpretations of culture and history.

Today the coupling of these two related subjects is relatively rare, as – while anatomical similarities between humans and other mammals make skeletal studies technically relevant to each other –, interpretations of animal and human remains fundamentally differ in archaeology.

According to Google Ngram Viewer, the relative frequency of some related terms changed at different rates in the general English language technical literature between 1970 and the mid-2010s (Figure 1). Environmental archaeology was chosen as the general concept that has inspired the use of natural sciences in archaeology. In the late 20<sup>th</sup> century, it has largely developed parallel with archaeozoology, the latter being increasingly referred to as zooarchaeology recently (Bartosiewicz, 2001, p. 78). In British usage Old World terminology, i.e. archaeozoology, dominated until the late 1980s when a radical decline followed (Bartosiewicz, 2019, p. 30, Fig. 2).

Synonyms for palaeoanthropology were more difficult to find as the study of human remains in archaeology is covered by various names. E. g. the term bioarchaeology (not shown in the diagram) is increasingly frequent. But while in the US it is a word largely used for the study of human remains, such as human palaeopathology, elsewhere it also includes the archaeological study of all living organisms, humans, animals, plants and even microorganisms. Physical anthropology, on the other hand, is not limited to archaeological usage.



**Fig. 1.** Diachronic trends in the relative frequencies of the terms osteoarchaeology, environmental archaeology, archaeozoology/zooarchaeology, and palaeoanthropology in the general English language literature. Circles indicate the five-year moving average percent of articles discussing/utilizing scientific methods in *Fornvannen*. Basic data: Google Books Ngram Viewer, Lidén 2006.

**1 pav.** Osteoarcheologijos, aplinkos archeologijos, archeozoologijos / zooarcheologijos terminų vartojimas literatūroje anglų kalba. Apskritimai rodo terminų vartojimą archeologijai ir viduramžių menui skirto Švedijos žurnalo *Fornvannen* mokslinėse publikacijose. Duomenys pagal „Google Books Ngram Viewer“, Lidén, 2006

Although there are elucidating differences between British and American usages of some of the words studied here (Bartosiewicz, 2019, p. 30, Fig. 2), in this diagram I decided to plot English in general, as it covers the broadest literature published world-wide, thereby enhancing the statistical reliability of the patterns to be discussed. On a different, local scale, Lidén (2006) also noted ca. 20 years long cycles in the five-year moving average percent of papers utilizing or discussing general scientific methods in the Swedish archaeological journal *Fornvännen* between the beginning of the 20<sup>th</sup> century and 2006. The last two of these have also been included in Figure 1. Following an upsurge in all scientific methods during the 1960s, a marked lull becomes noticeable around the 1980s (Lidén, 2006, p. 102, Fig. 2). Its graph ends with another dip around 2006, similar to the setback seen in at least two terms shown in Figure 1. The number of articles utilizing or discussing osteology published in *Fornvännen* seems to have been too few to reflect this clear trend (Lidén, 2006, p. 98, Fig. 1).

Figure 1 shows a modest but steady relative increase in the use of palaeoanthropology and osteoarchaeology, paralleling each other. The relatively rare usage of these two terms does not reflect the dynamic changes shown by the rest of the graph. Nevertheless, the relevance of the joint osteoarchaeological approach is shown by successful fora such as the *International Journal of Osteoarchaeology*, published since 1991, devoted to research on both human and animal bones and the “*Gesellschaft für Archäozoologie und Prähistorische Anthropologie*” established in Konstanz (Germany) in 1994. However, the contrast to the dynamics expressed in comparison with especially archaeozoology/zoarchaeology is still remarkable.

Following a lull in the early 2010s, archaeozoology/zoarchaeology show a steep upswing. In part, this may be related to the fact that mass-spectrometry based laboratory methods and ancient DNA studies have come of age. They have included initiatives in dietary isotope studies (DeNiro and Epstein 1978), AMS dating (Gowlett and Hedges, 1986), and ZooMS (Buckley et al., 2008) as well as studies of ancient DNA (Higuchi et al., 1984). As these methods became increasingly available, animal remains became widely used in various studies. This is not to say that using the same advanced techniques has not revolutionized the analysis of human remains in archaeology (Tauber, 1981). A similar trend may be masked by the aforementioned linguistic diversity of naming human research in archaeology. In addition, animal studies are also more visible from a quantitative point of view as they represent numerous taxa, each studied separately in palaeogenetic research. Animal bones are also frequently analysed in parallel with human remains, e. g. in the study of dietary stable isotopes.

Regardless of the difference between researching humans and animals in osteoarchaeology, humanities in general seem to be moving out of what has been called the postmodern phase in mental history. Although the direction and rate of change is unclear, archaeology is no exception in this regard (Fahlander, 2012). Osteoarchaeologists with a primary education in natural sciences (such as traditional archaeozoologists) may understand some new techniques more easily than those whose background lay in archaeology with a secondary specialization in osteology. The roots of this difference are, however, deeper than immediate training. Inductive reasoning, the analysis of cumulative information has long been a basic tool in humanities, including archaeology. Natural sciences, on the other hand, use deductive reasoning, testing hypotheses on carefully planned, often experimental data. The fact that the latter are rarely available in archaeology has been a source of extensive debates regarding the meaning of archaeological sciences (Bartosiewicz, 2001, p. 78).

How have these general trends been manifested in the history of current Swedish osteoarchaeology? In this paper I made an attempt to illustrate some highlights of the discipline and place them within a broader, international context with special regard to the Baltic region.

## A perspective from Sweden

The Osteoarchaeological Research Laboratory in Stockholm was initiated by Nils-Gustaf Gejvall (1911–1991; Figure 2) and established in 1967. A zoologist by training specialized in osteology (Stjernquist, 1992, p. 115), Gejvall became an expert in both human and animal osteoarchaeology carrying out pioneering research in the identification



**Fig. 2.** Nils-Gustaf Gejvall. *Photo by Lenart Nilsson.*  
 2 pav. Nilsas-Gustafas Gejvallis. *Lenarto Nilsono nuotrauka*

and analysis of cremated remains. Prior to the establishment of the laboratory, Gejvall (1966) contributed to ground-breaking advances in the computer registration of animal remains from archaeological sites. He worked out a 80-column coding form for osteological description, also entering physical modifications, such as traces of gnawing, cut marks, etc. into the newly devised data base. He first recorded 25,300 fragments from the University of Cincinnati (OH) excavations at Lerna, Greece. He recognized that in the future computerization would be the solution to all archaeological and museum work, as it had already proven efficient in a number of other scientific and public activities at the time.

With the opening of the new research facility at Stockholm University, the study of human and animal bones from archaeological sites was officially recognized, offering opportunities to regularly lecture archaeology students on the subject and carry out both basic and applied research within the new institution. Gejvall led the newly founded Osteoarchaeological Research Laboratory during its first decade, until his retirement in 1977.

Why was opening the new laboratory a remarkable achievement? According to Don Brothwell (2016, p. 160), when Gejvall first contacted him prior to the publication of his thesis based on osteoarchaeological research at medieval Westerhus (Gejvall, 1960) around 1959, he expressed grave concern about the academic future for osteoarchaeology in Sweden, represented only by a small research group at Stockholm University at the time. Fortunately, Gejvall found a sympathetic supporter in Gustaf VI Adolf (1882–1973), King of Sweden between 1950–1973. The king had a widely documented lifelong interest in archaeology and art (Jansson, 1972; Fjellman, 1973). Thus a new osteoarchaeological institution could be founded with the help of appropriations from the King Gustaf VI Adolf's 80-year Fund for Swedish Culture and the Knut and Alice Wallenberg Foundation at the royal premises of Ulriksdals Kungsgård, north of Stockholm. The Osteoarchaeological Research Laboratory first operated in the historic stables of Ulriksdal Palace (Figure 3) from 1967 until 2005, when it moved in with the Department of Archaeology and Classical Studies near the main campus of Stockholm University in Frescati.

Gejvall himself was an active member in several academic organisations such as the *Kungliga Vitterhets Historie och Antikvitets Akademien*, *Kungliga Humanistiska Vetenskapssamfundet i Lund*, The Royal Anthropological Institute of Great Britain and Ireland as well as the American Association of Physical Anthropologists. In addition to his personal recognition, student engagement has been seen as key to the success of the Osteoarchaeological Research Laboratory. The first PhD dissertation written in the newly founded laboratory by Elisabeth Iregren (1972) was a study of cremated Iron Age human as well as animal bones, reflecting the dual interests of the institution. As a reminder of this approach, the cover picture from the book of Ian W. Cornwall (1956) '*Bones for the archaeologist*', an artwork by Maitland Howard, has been used to decorate the laboratory for decades (Figure 4). A review of 21 dissertations defended at the Osteoarchaeological Research Laboratory between 1972–2018 showed a slight dominance of animal-related topics (43%) over those of human bone analyses (33%), while the remaining quarter of theses treated general osteological problems equally relevant to human and animal remains. Animal-oriented theses encompass a broad range of species, although cattle and seals have been more frequently singled out for doctoral studies than other mammals. The chronological distribution of PhD topics has been dominated by the analyses of Stone Age and medieval bone materials (Storå and Bartosie-



**Fig. 3.** The stables of Ulriksdal Palace today, the first premises of the Osteoarchaeological Research Laboratory. *Photo by the author.*

**3 pav.** Ulriksdalio rūmų arklidės – pirmosios Osteoarcheologinių tyrimų laboratorijos patalpos, šių dienų vaizdas. *Autoriaus nuotr.*

wicz, 2019, p. 47, Figs. 8–9). Today osteoarchaeology has developed into one of the four specializations taught at the Department of Archaeology and Classical Studies within the framework of general archaeology.

As a remarkable development, osteoarchaeology has become an independent subject at three universities in Sweden during the last two decades. At Lund University it is called historical osteology. It has been developed in Lund by Elisabeth Iregren since the early 1990s. The Lund department was also the first in Sweden to offer a master's course in osteoarchaeology. At Uppsala University, osteoarchaeological education is provided at Campus Gotland. The curriculum (today named osteology) was built up by Ebba During, another doctoral graduate of the Osteoarchaeological Research Laboratory (During, 1986). This program began as a summer course in the 1990s. Since 1999, four semesters of osteology have been taught within the framework of archaeology on Gotland. From 2008 onwards a master's degree has also been offered by this institution.

The recent history of osteoarchaeology shows an interesting generational tendency, evident on a broad international scale as well. The “Great Generation” of experts in the 1960s consisted of highly respected individuals across Europe who through their merits and research achievements functioned as hubs in international networks by creating “schools”, whether in formal or informal terms. By the new millennium, their former students, consolidated in their own careers, began forming a less hierarchical, increasingly horizontal network. As a result of this gradual “democratization” process involving an increasing number of experts, junior scholars today routinely participate in large research teams on a grand scale within the framework of international projects, e.g., financed by the European Research Council. This changing scenario does not diminish or dilute personal achievement, but reorients responsibility and fosters genuine cooperation in which the standing of individuals remains more equal even if leadership is acknowledged. The long-term effect of large scale international funding is facilitating projects that are able to address the immense accumulation of data in archaeology, supporting a generation of young researchers often with very diverse academic and national backgrounds. This promising tendency will help eliminating sharp divisions between natural science and humanities, data and theory in the future. Encouraging examples of recent projects run with the participation of researchers of the Osteoarchaeological Research Laboratory involve the traditional osteological analysis of animal and human remains in combination with advanced laboratory methods including aDNA research (e.g. Ersmark et al., 2019; Fraser et al., 2017; Ollivier et al., 2018; Frantz et al., 2019; Landeschi et al., 2019; Price et al., 2019). Of these, the current project titled ‘*The Atlas of ancient human genomes in Sweden*’ stands out. This research is aimed at deciphering demo-



**Fig. 4.** Enlarged cover picture of Cornwall's book decorating the Osteoarchaeological Research Laboratory. *Photo by the author.*  
**4 pav.** Padidintas Cornwallio knygos viršelio piešinys, puošęs Osteoarcheologinių tyrimų laboratoriją. *Autorius nuotr.*

graphic developments behind the chronological and geographical distribution of material culture observed by archaeologists (e.g. Malmström et al., 2015; Coutinho et al., 2020). Evidence of migrations, isolation and genetic introgression can be demonstrated using sufficient series of ancient human genomes. In the Osteoarchaeological Research Laboratory, Anna Kjellström and Jan Storå are involved in selecting and interpreting human bones from the Mesolithic to the Early Middle Ages for this project. Their genomic research has also been expanded to include other areas in Eurasia (Günther et al., 2015; Kılınç et al., 2016; Omrak et al., 2016).

### Human and animal osteoarchaeology

Until recently, the Osteoarchaeological Research Laboratory housed a famous 19<sup>th</sup> century collection of human crania owned by Stockholm's Karolinska Institutet, a medical university involved in current medical research. This craniological collection was largely assembled during the first half of the 19<sup>th</sup> century by Anders Retzius (1796–1860), then professor of anatomy. It was maintained and further expanded under the tenure of his successors Gustaf von Düben (1822–1892) and Gustaf Retzius (1842–1919). The collection was used by physical anthropologists in studying human variation in physical appearance. Craniometric research in the 18<sup>th</sup>–19<sup>th</sup> century conformed the ruling idea of the age, that rigid classification was the best means of scientific orientation in an increasingly complex-looking world. This simplistic and undifferentiated conceptual approach gave rise to inadequate generalizations and growing errors (Pucher, 2013, p. 54). In addition, a keen scientific interest in the categories of race and nation emerged by the late 19<sup>th</sup> century, frequently conflating biological and cultural phenomena. The main Swedish representative of this line of inquiry, ultimately leading to “race biology” was Gustaf Retzius. Many skulls in the Retzius collection originate from a variety of countries, purchased, traded or collected through a complex network of 19<sup>th</sup> century expeditions and institutional exchanges (Ljungström, 2014). Interpretations turned dangerous when cranial measurements became instrumental in classification and skull volume, i.e., brain size, became a proxy to intellectual faculties. By now it is clear that much of this research was based

largely on racial and social prejudices of the scholars rather than scientific objectivity (Gould, 1981, p. 43). Its links to phrenology (Retzius, 1891), today recognized as pseudoscience, have led to the darkest days of eugenics (e.g. Lorenz, 1940) with fatal historical consequences. Due to mounting ethical concerns, the Osteoarchaeological Research Laboratory withdrew the Retzius Collection from daily teaching and has recently returned it to the Karolinska Institutet's Medical History and Heritage Unit. Whenever possible, crania were repatriated to indigenous communities world-wide for proper treatment and eventual burial. At Stockholm University the current research of human remains has been focusing on less contentious topics. The osteological remains of archaeological individuals are studied in an effort to understand human origins and reconstructing ancient lifeways including pathologies, diet and ancient migrations as exemplified by the Atlas Project. In 1988, the Wenner-Gren International Symposium on *'Behaviour of the Earliest Hominids'* was organized at the Osteoarchaeological Research Laboratory with an opening address by King Carl XVI Gustaf.

The study of animal remains has not been overshadowed by the dark ethical and political controversies of the 20<sup>th</sup> century. Environmental thinking in archaeology was stimulated by an increasing interest in ecological change heralded in popular culture by Rachel Carson's 1962 best seller, *'Silent spring'*. An "ecological approach to Prehistory" was soon emphatically advocated (Butzer, 1964), and animal bones (along with charcoal, macrobotanical remains, and pollen) became important "ecofacts" in the reconstruction of ancient environments. This overall, explicitly positivist trend became even stronger with the emergence of "New Archaeology" (Binford and Binford, 1968; also known as processual archaeology) that promoted a distinctly scientific approach (Brothwell and Higgs, 1970). The foundation of the Osteoarchaeological Research Laboratory took place at this time, the heyday of archaeozoology, when the appreciation of post-World War II archaeological bone studies gradually increased world-wide. The "Great Generation" of archaeozoologists began working in institutions across Europe, a trend visibly marked by the 1956 publication of Cornwall's aforementioned seminal book, *'Bones for the Archaeologist'*. In 1971, the first meeting of the International Council for Archaeozoology (ICAZ) took place in Budapest, Hungary.

An outstanding character in Swedish archaeozoology of this period was Johannes Lepiksaar (1907–2005). He graduated in zoology at the Faculty of Mathematics and Natural Sciences of the University of Tartu, Estonia, in 1930. From 1941 to 1943 he was employed as a lecturer at the same university (Lõugas, 2009). As Estonia was repeatedly contested and occupied by the Soviet Union and Nazi Germany during World War II (ultimately being incorporated into the former), he fled to Sweden in 1944. He was followed by his wife Niina (1911–1994), a fellow-biologist and accomplished illustrator. Following five years in Uppsala, Lepiksaar found employment at the Göteborg Museum of Natural History in 1949, where he worked until his retirement in 1972. Lepiksaar began identifying animal bones from the Lammasmäe mound at Kunda and other sites in Estonia already in 1933–1937, as an assistant at the Institute of Zoology of the University of Tartu. Following the initial disruption caused by emigration, he began significantly contributing to archaeological research in Sweden (Kaelas, 1999). His academic merit was recognized in the form of Honorary Doctorates at the Universities of Göteborg (1968)



**Fig. 5.** Niina and Johannes Lepiksaar. (Clason ed., 1975).

**5 pav.** Niina ir Johannesas Lepiksaarai (iš Clason, red., 1975)



**Fig. 6.** Don Brothwell during his promotion to honorary doctor at the Stockholm City Hall on 6 October 1989. *Photographer unknown.*

**6 pav.** Donas Brothvelas garbės daktaro vardo suteikimo ceremonijoje Stokholmo rotušėje 1989 m. spalio 6 d. Nežinomo autoriaus nuotrauka

and Lund (1988). Following the “Singing Revolution” marking the beginning of independence of the Baltic States from the Soviet Union, he became an honorary member of the Estonian Society of Naturalists in 1990. A less official, but equally important form of spontaneous appreciation by peers and former students came in the form of several edited volumes dedicated to him and even Niina (Figure 5), including the proceedings of the 2<sup>nd</sup> International Conference of ICAZ, organized in Groningen, the Netherlands in 1974 (Clason ed., 1975; see also Iregren and Liljekvist eds., 1989; LaBianca and von den Driesch eds., 1995).

### International networking, publications

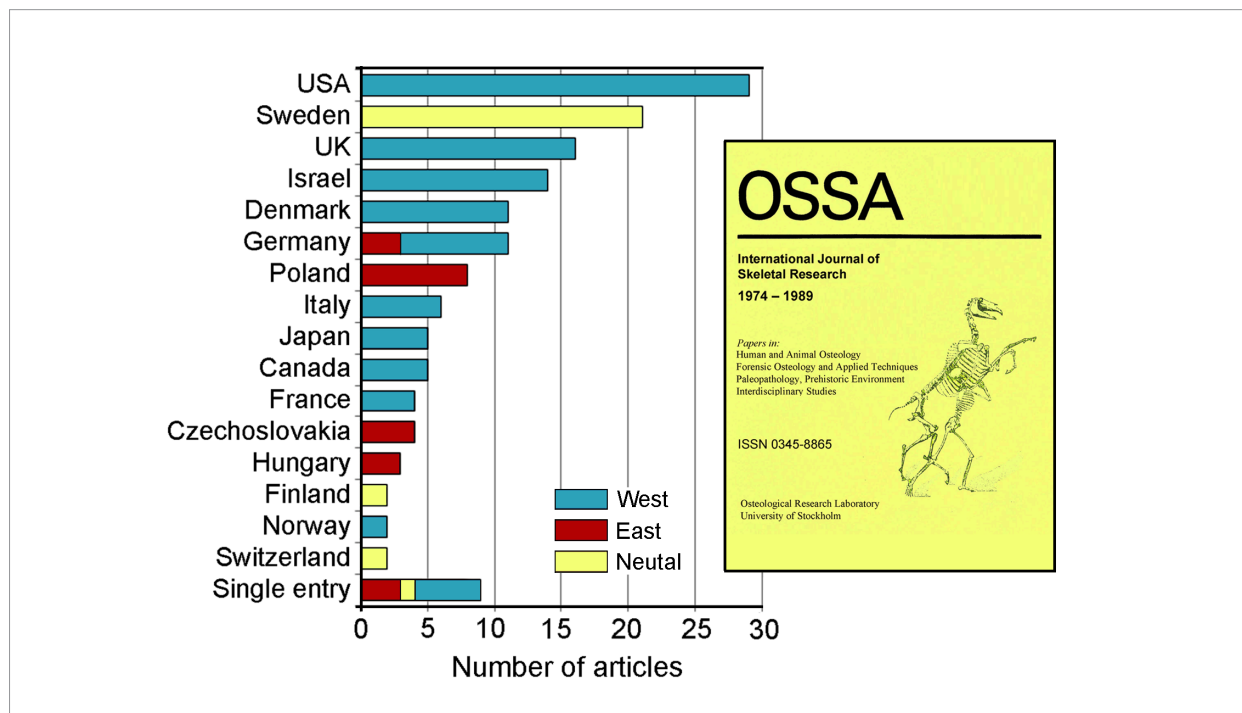
An important British link with Stockholm existed even prior to the 1967 foundation of the Osteoarchaeological Research Laboratory in the form of the collegial relationship between Gejvall and Brothwell. The latter was appointed to Cornwall’s position at the Institute of Archaeology (University of London) as senior lecturer in zooarchaeology in 1974. Their long-time and manifold cooperation was recognized in the form of an honorary doctorate granted to Brothwell at Stockholm University in 1989 (Figure 6).

Already in 1968, Gejvall wrote a monograph on the pre-Roman Iron Age to late Viking age human bones from Skedemosse in Öland. It was published in cooperation with the archaeozoologists Joachim Boessneck and Angela von den Driesch-Karpf (Boessneck et al., 1968) of the *Institut für Paläoanatomie, Domestikationsforschung und Geschichte der Tiermedizin* in München. Boessneck’s institute was perhaps the most important hub of archaeozoology in Central Europe at the time. It became an independent institution in 1964 when the Veterinary Faculty in München removed the subject area osteoarchaeology from the curriculum of the Institute of Animal Anatomy in order to give it better opportunities to develop. When Gejvall received another contract to study the large animal bone assemblage from Eketorp fort, the renowned Iron Age site in southeastern Öland, he again involved his German colleagues in what grew into a major international cooperative project (Boessneck et al., 1979).

Although Lepiksaar’s broad range of expertise included teriology, ornithology and ichthyology, internationally he became best known for his unique knowledge of fish osteology. He participated in international projects, among others with Boessneck and von den Driesch (e.g. Lepiksaar, 1995).

Although Lepiksaar did not hold a university position, throughout the last quarter of the 20<sup>th</sup> century he individually taught and mentored members of an entire generation of archaeozoologists from many countries of Europe. In addition to Sweden, these included Belgium, Denmark, Estonia, both the FDR and GDR, Hungary, the Netherlands, and Spain, just to name the countries where he had the largest impact. As ichthyoarchaeology is a relatively narrow field, his work in education resulted in a tightly knit academic community. The Fish Remains Working Group, populated mostly by his former students, was the first such specialized entity within ICAZ. This working group was created during an informal meeting held at the Zoological Museum of the University of Copenhagen in 1980. Although the event took place well after Lepiksaar’s retirement, for years members of this





**Fig. 7.** The international composition of authorship in Ossa based on 152 articles. The distinction between countries of the West and East conforms Cold War political terminology.

*7 pav. Žurnalo Ossa autorių tarptautinė sudėtis 152 straipsnių duomenimis. Vakarų ir Rytų šalys išskirtos pagal Šaltojo karo laikų politinę terminologiją*

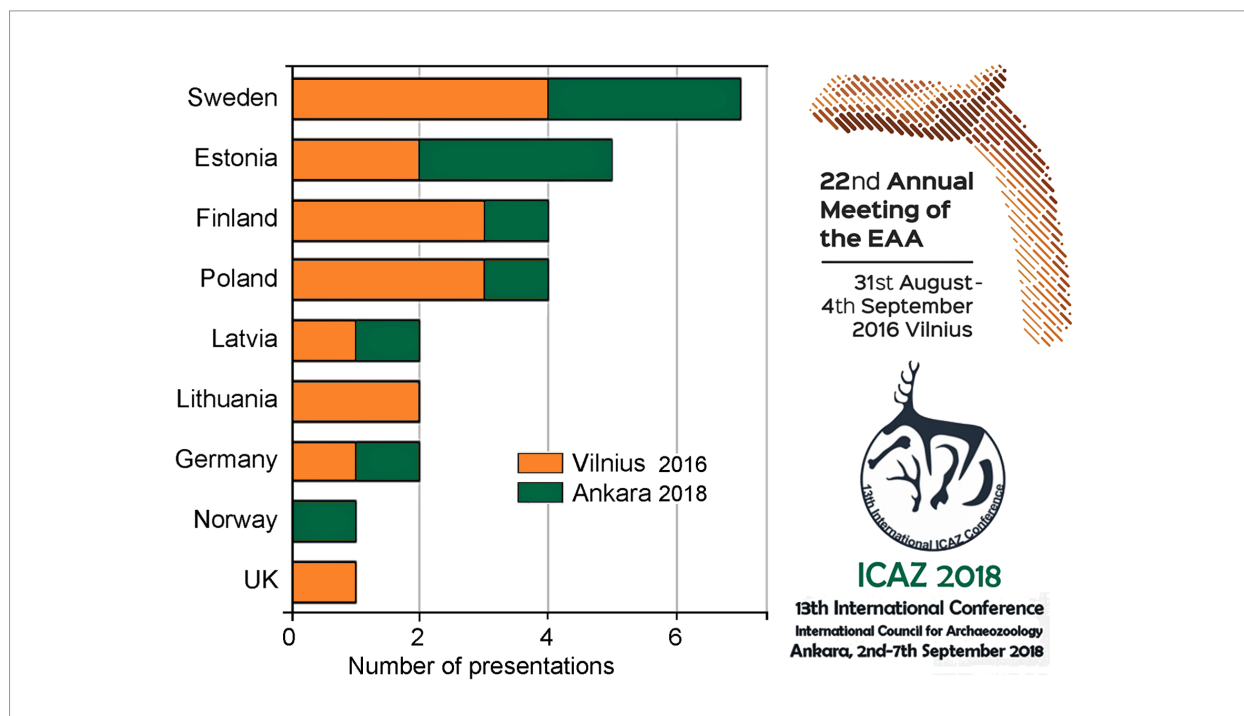
group enjoyed his and Niina's hospitality in their small home in Göteborg, where the living room was turned into a library with a maze of four parallel bookshelves, and one of the two bedrooms housed the osteological collections and a file cabinet of animal-related newspaper articles. While Gejvall used all institutional opportunities to promote osteoarchaeology from top-down, building a network to benefit the subject area, Lepiksaar's influence was more bottom-up, mediated through the grassroots efforts of his committed students. It also contributed to the post-Soviet development of the field significantly in Estonia where he donated his library and reference collections to support a new generation of experts.

Ossa, the '*International Journal of Skeletal Research*' was a journal published by the Osteological Research Laboratory between 1974 and 1989. Its international editorial board encouraged the submission of scholarly articles in English and German. Sixteen volumes of various lengths (including two "Letters" and three supplements) were published. Studies in human osteology dominated among the 152 articles published during this period. Only 18 (12%) were devoted to research on animal bones. The international composition of contributors showed some remarkable patterns (Figure 7). Ossa was a preferred forum not only by authors in the host country, Sweden, but also by physical anthropologists in the United States and Canada. There was an impressive representation of research in the UK and Israel, especially in light of the relatively few articles published from Nordic countries other than Sweden. At the wake of the Cold War in Europe Ossa was an important medium bridging the communication gap between Western and Eastern countries created by politically motivated military animosity. (In the period of 1971–1990 ICAZ fulfilled a similar mission in the free flow of academic ideas by organizing its quadrennial meetings alternating between cities of Eastern and Western Europe). According to Figure 7, Ossa published papers from both countries (FRG and GDR) that represented politically still divided Germany. Single entries included one article each from the Soviet Union and Vietnam, reunified in 1976.

Relationships between natural science and arts and humanities, as well as attitudes to scholarly authority had developed differently in various countries even prior to the mid-20<sup>th</sup> century (Bartosiewicz, 2001, p. 77). These differences in research tradition were consolidated by the division embodied by the “Iron Curtain”. This is why maintaining every possible line of communication was very important during those years. The publication of OSSA ceased in 1990 on the eve of political changes in Europe. In 2004, the Osteological Research Laboratory launched its own monograph series ‘*Theses and Papers in Osteoarchaeology*’ which has become an important forum for scientific work carried out within the Laboratory.

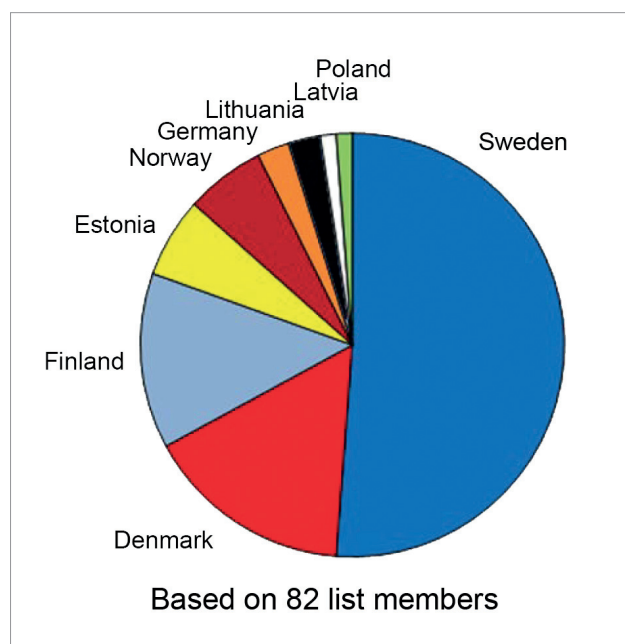
Another form of scholarly cooperation in animal osteoarchaeology within the region is facilitated by the Archaeozoology of the Baltic Region and Adjacent Areas (ABRA) Working Group of ICAZ. The general purpose of ABRA is thus to provide a platform for the exchange of academic information, personnel and research materials in animal osteoarchaeology within the broader region. The Baltic Region is a clearly definable geographical unit possessing diverse aquatic and terrestrial habitats. In addition to environmental adaptations, the convoluted coastline with its archipelagos has facilitated both human settlement and communication during the shared history of this area since Prehistory. From the gradual withdrawal of the ice cover, through the protracted spread of neolithization up to the Hanseatic dominance of Baltic maritime trade between the early 12<sup>th</sup> and 15<sup>th</sup> century, there are many exciting developments that also involved the exploitation of animals in multitudes of cultural settings. The scope of research includes adjacent areas intimately linked to the Baltic Rim throughout its complex history. Today, the drainage area of the Baltic Sea is home to over eighty million people. Most inhabit the southern half of the region. Their rich archaeological heritage is shared by nine countries: Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia and Sweden. Archaeozoological studies in the region were divided by borders, each country having its own language (representing four major linguistic groups) and likewise variegated academic structures and research tradition. Results in these countries have been published in various media including local journals, regional bulletins, museum archival reports and dissertations. Germany and Poland, for example have similar post-World War II research traditions, while the Soviet Union represented a separate entity in spite of important contributions to osteoarchaeology by scholars in its various republics. Of the major languages, English became dominant in international communication in the region, the importance of German has steadily declined and Russian has never gained ground outside the borders of the former Soviet Union. The influence of French has been relatively weak (Bartosiewicz, 2001, p. 84). Even with good linguistic communication, archaeozoologists, especially in smaller countries, are relatively few and at risk of working in isolation. The working group grew out of the session titled ‘*Past animal and human relationships around the Baltic*’ held at the 22<sup>nd</sup> Annual Meeting of the European Association of Archaeologists held in 2016 in Vilnius, Lithuania. The working group was initiated by Tuija Kirkinen (University of Helsinki, Finland). In 2018 ABRA organized its own session at the 13<sup>th</sup> International Conference of ICAZ in Ankara, Turkey, titled: ‘*Animal introduction, adaptation and exploitation around the Baltic and beyond*’. The session was organized by Eve Rannamäe (University of York, UK/University of Tartu, Estonia). The composition of presentations by participating countries are shown in Figure 8.

The increased need for international cooperation among archaeozoologists is shown by a spontaneous parallel development. The first joint Nordic meeting for zooarchaeologists/animal osteologists was organized by Jacob Kveiborg, Kenneth Ritchie, and Susanne Østergaard at Moesgaard Museum near Århus, Denmark in 2017. The second was hosted by Sara Gummesson and Bettina Stolle at the Osteoarchaeological Research Laboratory, Stockholm in 2018. The third meeting took place in the Natural History collections of the University Museum of Bergen, Norway organized by Hanneke Meijer, Samuel James Walker, and Liselotte Takken Beijersbergen in 2019. The scope and composition of the two formations largely overlap, it is the geographical emphasis which in this latter case is somewhat shifted toward the north relative to ABRA, toward the territory of Fennoscandia (Figure 9). The style of meetings somewhat also differs as the Nordic meeting for zooarchaeologists has more business discussions and round table events relevant to close cooperation within a linguistically and administratively more



**Fig. 8.** The international composition of presentations made by participants of the ABRA group at the 22<sup>nd</sup> Annual Meeting of the European Association of Archaeologists in 2016 in Vilnius, and in 2018 at the 13<sup>th</sup> International Conference of ICAZ in Ankara.

**8 pav.** Baltijos regiono ir gretimų kraštų darbo grupės (ABRA) pranešėjų tarptautinė sudėtis 22-ojoje Europos archeologų konferencijoje Vilniuje 2016 m. ir 13-oje Tarptautinės archeozoologų tarybos (ICAZ) konferencijoje Ankaroje 2018 m.



**Fig. 9.** The international composition of members in the 2018 mailing list of the Nordic meeting for zooarchaeologists/animal osteologists.

**9 pav.** Šiaurės zooarcheologų / gyvūnų osteologų konferencijos 2018 m. dalyvių tarptautinė sudėtis pagal susirašinėjimo adresus

homogeneous region where academic structures, financing and quality control are more comparable with each other than among all Baltic countries. Although English is being readily used in the Nordic meetings, various Scandinavian speakers can easily communicate with each other using their own respective languages (even in Finland Swedish is being taught as one of the two official languages). It is important, however, that open scholarly cooperation in an informal atmosphere is the driving force behind both professional formations.

The meeting '*Investigating bones: diet, health, environment in the Baltic region. The 10<sup>th</sup> International Conference in honor of Jonas Puzinas*' organized by Giedrė Piličiauskienė and Justina Kozakaitė at Vilnius University in 2019 was an important step in the process of integrating osteoarchaeological research, connecting not only experts from a number of Baltic countries, but also re-connecting human and animal osteoarchaeology as well as new research methods utilizing organic remains in expanding the horizons of these two branches of study.

## Concluding thoughts

Exactly 120 years prior to the publication of '*Silent spring*' Japetus Steenstrup used postglacial subfossils to interpret climate change in the analysis of Vidnesdam and Lillemose bogs in northern Zealand across from the West Coast of Sweden (Steenstrup, 1842). He realized that a pattern in the succession of vegetation was correlated with climatic change. On the other hand, working in a team with geologists and archeologists (Forchhammer et al., 1851–1856), he was also the first to recognize that animal remains preserved in prehistoric shell-middens along the Danish coast originated from prehistoric human action. According to Kristiansen (2014, p. 14) this ca. 1850–1860 period may be considered the first scientific revolution in archaeology, when it emerged as an independent discipline in a close cooperation with zoology and geology. In spite of this encouraging beginning, multidisciplinary cooperation in archaeology has had setbacks, preventing it gaining a steady momentum. About a century later, a breakthrough in nuclear research brought about <sup>14</sup>C dating in archaeology, reorienting interpretations paving the way to science-oriented New Archaeology (Kristiansen, 2014, p. 14). Widely popularized scientific achievements illustrate this era: the 1960s began with a man successfully returning from the orbit and ended with another one setting foot on the Moon. Faith in technology has probably never been greater. As New Archaeology became increasingly popular in the US, however, Marshall Sahlins, an authority in modern anthropology, referred to the '*characteristic failing of interdisciplinary study – an enterprise which often seems to merit definition as the process by which the unknowns of one's own subject matter are multiplied by the uncertainties of some other science.*' (Sahlins, 1972, p. 51). While technical innovation and interdisciplinary cooperation are becoming increasingly inevitable, some skepticism is still due. By the end of the 20<sup>th</sup> century, it became patently clear that natural sciences could not offer panacea to all problems in archaeology: disillusionment with traditional osteoarchaeology (as well as other scientific methods) fostered a less science-oriented stance, expressed in the emergence of post-processual archaeology. Largely British-inspired post-processual archaeology has been strongly critical of the idea that scientific methods could produce objective results in archaeology (Johnson, 1999, p. 98–99), fearing that an emphasis on regularities, quantification and modeling would lead to "dehumanization" of the past (Shanks and Tilley, 1987, p. 77). It has been an influential trend that, in part evolved as a direct reaction to New (i.e. processual) Archaeology, may be one of the reasons behind the fall in references to environmental archaeology and archaeozoology/zooarchaeology in Figure 1. A break is also visible in the five-year moving average of papers relevant to general scientific methods in *Fornvännen*. Following steady upsurges of science-oriented archaeology during the 1960s, a marked lull around the 1980s seems to coincide with the strengthening intellectual movement of post-processualism, when quantitative methods and science-based knowledge more-or-less disappeared from the mainstream of archaeological interpretation.

Osteoarchaeologists working in distant continents frequently seem to have far more in common with each other than the interest archaeologists share with physicists within their respective home countries, even if the

mutual interests of both lay in the procurement of reliable absolute dates. It should be understood that investigations in humanities and natural science are not competing or mutually exclusive. They are inseparable in drafting the possibly most reliable picture of the past. What still seems to be lacking in many cases, is the consistent and creative dialogue between archaeologists and natural scientists. This may lead to misuses of archaeological science – by archaeologists as well as natural scientists. Scientific methodology evolves rapidly and is becoming increasingly complex. In the absence of an in-depth understanding of scientific methods, archaeological interpretations sometimes lack source criticism or isolated results may be taken as a proxy for “people”, rather than individuals. Some scientists, on the other hand, use archaeology as mere cosmetics to make their results more colorful or simply ignore cultural implications (Lidén and Eriksson, 2013, p. 13–17). However, the age of polymaths has long been over, individuals have limited knowledge for tackling a holistic scenario. Today viable projects demand increasing and substantial collaboration between representatives of numerous disciplines as seen in the example of recent osteoarchaeological research in the region.

Along with the expanding use of sophisticated scientific methods aimed at elucidating phenomena in past natural and social environments, archaeology has also been facing a host of frequently inter-related contemporary challenges such as climate change, environmental fluctuations, mass-migration and pandemics. Studying the history, structure and mechanics of these major phenomena will make transdisciplinary cooperation more important than ever.

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## Nesutarimai dėl kaulų. Pamąstymai apie osteoarcheologiją ir Baltijos regioną

László Bartosiewicz

Santrauka

Archeologija *ab ovo* turėtų būti tarpdalykinis mokslas. Osteoarcheologija yra archeologinėse vietovėse rastų gyvūnų ir žmonių liekanų tyrimai, tai kartu ir gamtos, ir humanitarinis mokslas. Šių dviejų susijusių sričių tyrimai kartu atliekami retai. Nors žmonių ir gyvūnų anatominis panašumas lemia techniškai panašius jų tyrimus, archeologijoje naudojamos gyvūnų ir žmonių kaulų tyrimų interpretacijos yra visiškai skirtingos. Į osteologinių tyrimų raidą galima pažvelgti per Švedijos pavyzdį. Osteoarcheologinių tyrimų laboratoriją Stokholme 1967 m., remiamas karaliaus Gustavo IV Adolfo, įkūrė zoologas Nilsas-Gustafas Gejvallis (1911–1991), tapęs gyvūnų ir žmonių osteologu bei kremuotų kaulų tyrimų pradininku ir vadovavęs savo paties įkurtai laboratorijai iki 1977 m. Tuo metu buvo pradėta vertinti žmonių ir gyvūnų kaulų tyrimų reikšmė, imti rengti studentai. Osteoarcheologinių tyrimų laboratorijoje 1972 m. buvo apginta pirmoji disertacija, o iki 2018 m. iš viso jų apginta 21, didesnė dalis jų buvo skirtos gyvūnų tyrimams (43 %), žmonių tyrimams – 33 %, likusios gvildeno bendro pobūdžio osteologines problemas. Populiariausios laboratorijoje tiriamos rūšys yra galvijai ir ruoniai, mėgstamiausi laikotarpiai – akmens amžius ir viduramžiai. Osteoarcheologija yra tapusi viena iš keturių Stokholmo universiteto Archeologijos ir klasikinių studijų katedros specializacijų ir kaip atskiro dalyko jos mokoma Lundo ir Gotlando (Upsalos) universitetuose.

Žmonių ir gyvūnų osteoarcheologiniai tyrimai klostėsi skirtingai. Senosios antropologinės kolekcijos ir jų tyrimai XX a. pirmoje pusėje kelia daug politinių ir etinių klausimų, su kuriais nesusidursime gyvūnų kaulų studijose. Nuo XX a. septintojo dešimtmečio pradžios susidomėjimas gyvūnų kaulais didėjo dėl kylančio susidomėjimo aplinka ir joje vykstančiais pokyčiais. 1971 m. Budapešte įvyko pirmasis Tarptautinės archeozoologų tarybos susitikimas. Būtina paminėti vieną svarbią Švedijos ir Baltijos archeozoologijos istorijoje asmenybę – Johannesą Lepiksaarą (1907–2005). Jis kartu su žmona Nina nuo ateinančių sovietų 1944 m. pabėgo iš Estijos į Švediją ir beveik visą gyvenimą dirbo Geteborgo gamtos istorijos muziejuje. Jo nuopelnai įvertinti Geteborgo ir Lundo universitetų garbės daktaro vardais, J. Lepiksaarui dedikuota ne viena archeologinė jo buvusių mokinių knyga. Iki XX a. paskutinio ketvirčio jis nedirbo universitete ir daugybę įvairių Europos šalių archeozoologų mokė asmeniškai. J. Lepiksaaras buvo ne tik puikus žinduolių ir paukščių specialistas, bet ir ypač gerai nusimanė apie žuvis. Jo buvę mokiniai 1980 m. įkūrė ir Žuvų tyrėjų darbo grupę (FRWG). Apibendrinant galima pasakyti, kad archeozoologijai Švedijoje išskirti padėjo dvi asmenybės – N.-G. Gejvallis ir J. Lepiksaaras. Pastarasis padarė didelę įtaką naujai Estijos zooarcheologų kartai, jo biblioteka ir žuvų skeletų kolekcija yra padovanotos Talino universitetui.

Svarbi osteoarcheologijos veiklos kryptis – rezultatų sklaida ir tyrėjų bendravimas. Stokholmo Osteologinių tyrimų laboratorija 1974–1989 m. leido žurnalą OSSA. Jame dominavo žmonių tyrimams skirti straipsniai ir tik 18 % iš 152 pasirodžiusių publikacijų buvo skirtos gyvūnams. Tačiau šis žurnalas, kaip ir ICAZ, atliko ir kitą svarbią funkciją – buvo tarpininkai ir jungiančios gijos tarp Vakarų ir Rytų tyrėjų. Vakarų ir Rytų bloko šalyse buvo susiklosčiusios skirtingos tyrimų tradicijos ir bendrauti, ypač griūvant geležinei uždangai, buvo itin svarbu. Nutrūkus OSSA leidybai, Osteoarcheologinių tyrimų laboratorija 2004 m. pradėjo leisti monografijų seriją „Thesis and papers in Osteoarcheology“. Yra įkurtos dvi Baltijos regiono valstybes siejančios tyrėjų grupės. 2016 m. Vilniuje, EAA konferencijos metu, įkurta Baltijos regiono tyrėjų darbo grupė (ARBA), kurios tikslas – keistis akademinė informacija, tyrėjais, medžiaga platesniame regione. Panašiais tikslais 2017 m. pradėti rengti ir Šiaurės zooarcheologų susitikimai (*Nordic zooarchaeology meetings*). Nors minėtos dvi grupės formaliai kiek dubliuoja viena kitą, tačiau yra labai skirtingos. *Nordic* grupės šalių tyrėjai yra artimi ne tik finansinėmis galimybėmis, bet ir tyrimų tradicijomis ar net galimybe suprasti vienas kitą kiekvienam kalbant savo kalba. ABRA šalių atstovai turi nemažai skirtumų. Vilniaus konferencija 2019 m. taip pat buvo bandymas suburti Baltijos regiono tyrėjus. Be to, čia daryk pabandyta sujungti gyvūnų ir žmonių osteoarcheologiją.

Nepaisant vis labiau intensyvėjančio tarpdalykinio bendradarbiavimo ir techninių naujovių, XX a. pabaigoje tapo aišku, kad gamtos mokslai negali išspręsti visų archeologijos problemų, o nusivylimas tradicine osteoarcheologija (kaip ir kitais moksliniais metodais) paskatino postprocesinės archeologijos – mažiau į mokslą orientuoto požiūrio, atsiradimą. Tai galėjo būti ir viena iš priežasčių, kodėl sumažėjo nuorodų į aplinkos archeologiją ir archeozoologiją / zooarcheologiją (1 pav.).

Humanitarinių ir gamtos mokslų tyrimai nėra konkuruojantys ar vienas kitą nuneigiantys. Deja, dažnai vis dar trūksta nuoseklaus ir kūrybingo archeologų ir gamtos mokslų atstovų dialogo, o tai gali sukelti vienių ir kitų piktnaudžiavimą archeologija. Mokslinė metodika tobulėja greitai ir tampa vis sudėtingesnė, o nesant išsamaus mokslinių metodų supratimo, archeologinėse interpretacijose gali pritrūkti šaltinių kritikos arba pavieniai rezultatai gali būti laikomi „žmonių“, o ne pavienių individų pavyzdžiu. Be to, kai kurie mokslininkai naudoja archeologiją kaip puošmeną, kad jų rezultatai būtų spalvingesni, arba tiesiog nepaiso kultūrinių implikacijų (Lidén ir Eriksson, 2013). Vykdam šiuolaikinius tyrimus reikia kuo glaudesnio įvairių sričių mokslininkų bendradarbiavimo. Juo labiau kad pastaruoju metu ir archeologija susiduria su įvairiais, dažnai tarpusavyje susijusiais iššūkiais, tokiais kaip klimato kaita, aplinkos nepastovumas, masinė migracija ir pandemijos. Studijuojant šių fenomenų istoriją, struktūrą ir veikimo principus, tarpdalykinis bendradarbiavimas yra svarbesnis nei bet kada.