Ethical challenges associated with the study and treatment of human remains in anthropological sciences in the 21st century

Desafíos éticos asociados al estudio y tratamiento de restos humanos en las ciencias antropológicas en el siglo XXI

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Abstract

Biological and forensic anthropologists have become increasingly aware of the ethical issues associated with research and teaching involving human remains. The process of exhumation, the analysis and the storage of remains have been the focus of regular attention from professionals and the media. Furthermore, due to the emergence of new technologies and methodologies, a number of additional issues have emerged over the past two decades. The aim of this article is to highlight the contemporary ethical challenges that the anthropological sciences and those involved in the study and treatment of human remains around the world are confronted with. Throughout this article, the characteristics of identified skeletal collections, the creation of human taphonomy facilities, the increase in destructive sampling (for biomolecular and histological analysis) and the use of digital imaging are explored, as well as the trade of human remains. Ethical concerns associated with each of these challenges are examined from a global perspective and within the Argentine local context. These issues are summarized taking recent history and contemporary research into account. Finally, on the basis of the topics raised throughout this article, a list of detailed recommendations is provided with the aim of improving ethical awareness and practice in anthropological science. Rev Arg Antrop Biol 23(2), 2021. doi:10.24215/18536387e034

Keywords: identified skeletal collections; destructive sampling; human taphonomy facilities; digitization of human remains; human remains trade
Resumen

Los antropólogos biólogos y forenses se han vuelto cada vez más conscientes de los problemas éticos asociados a la investigación y la enseñanza con restos humanos. El proceso de exhumación, el análisis y el almacenamiento de estos restos han sido el foco de atención habitual tanto de profesionales como de los medios de comunicación. Además, debido al surgimiento de nuevas tecnologías y metodologías, en las últimas décadas han aparecido una serie de preocupaciones adicionales. El objetivo de este artículo es destacar los desafíos éticos contemporáneos que enfrentan las ciencias antropológicas y aquellas involucradas con el estudio y tratamiento de restos humanos en todo el mundo. A lo largo de este trabajo se exploran las características de las colecciones esqueléticas identificadas, la creación de instalaciones de tafonomía humana, el aumento del muestreo destructivo (con fines de análisis biomolecular e histológico) y de la toma de imágenes digitales, así como el comercio de restos humanos. Las preocupaciones éticas asociadas con cada uno de estos desafíos se examinan, teniendo en cuenta la historia reciente y la investigación contemporánea, desde una perspectiva global y, en particular en el contexto argentino. Finalmente, se detallan una serie de recomendaciones con el objetivo de mejorar la conciencia ética y las prácticas en las ciencias antropológicas sobre los puntos planteados a lo largo de este documento. Rev Arg Antrop Biol 23(2), 2021. doi:10.24215/18536387e034

Palabras Clave: colecciones esqueléticas identificadas; muestreo destructivo; instalaciones de tafonomía humana; digitalización de restos humanos; comercio de restos humanos

There are several definitions of ethics that can be applied to research in biological and forensic anthropology. The bioarchaeologist Berit Sellevold (2012, p. 141) defines ethics as “a philosophy or system of morals”, while the philosopher Immanuel Kant emphasizes that ethics is a universally desirable principle or law (Blau, 2009). Ethics, as an aspect of morality can be considered as part of the phenomenon of “active production of social life by socially situated subjects that operate in historically generated relational, material and symbolic conditions” (Balbi 2016, p. 47), which provisionally defines certain forms of behaviour as acceptable or desirable. In this sense, ethical considerations in research are, to a large extent, dictated by political, legal, historical and cultural factors specific to particular societies (Fossheim, 2019). Thus, what one culture considers inappropriate or unethical is seen as an appropriate action by others (e.g. Halcrow et al., 2019; Huiracapán, Jaramillo and Acuto, 2017). The concept of ethics can be extended to the field of biological and forensic anthropology, since those working within these disciplines must overcome complex cultural, political, ideological and legal considerations, which are intertwined and may even contradict each other.

Good practice guidelines (Advisory Panel on the Archeology of Burials in England, 2013, 2017; British Association for Biological Anthropology and Osteoarcheology, 2019a; Department of Culture, Media and Sport, 2005; Finegan et al., 2020; Fondebrider, 2020; International Committee of the Red Cross, 2017), codes of ethics (American Association of Physical Anthropologists, 2003; British Association for Biological Anthropology and Osteoarcheology, 2019b; World Archeology Congress, 2019) and deontological codes (Aranda, Barrientos and Del Papa, 2014) have been used in biological and forensic anthropology as an attempt to lead researchers through the complex web of ethical problems associated with the investigation of human remains. However, many are outdated and
there are still obvious omissions in codes of ethics that have been recently updated by different professional associations. For example, the Declaration in Relation to the Ethics of the Study of Human Remains of the Argentine Association of Biological Anthropology (Asociación de Antropología Biológica Argentina, 2007) was drawn up due to numerous claims pertaining to the recovery, exhibition and requests for repatriation of human bodies of Indigenous origin. Later, these considerations were expanded upon, and in 2011 the Code of Ethics of the Argentine Association of Biological Anthropology (Aranda et al., 2014) was approved as a minimum set of ethical standards for the study, conservation and management of human remains. This code implies the observance of current legislation, professional responsibility and adequate justification for any intervention on human remains, although the use of new technologies or the dissemination of images was not considered. Similarly, the recent update of the British Association for Biological Anthropology and Osteoarchaeology (2019b) code of ethics did not address the dissemination of images of human bones on websites and social networks, nor did they take into account digital recording and printing, destructive sampling or the illegal trade of such remains. The latter is a very important point and had been addressed in the 2010 Code of Ethics (British Association for Biological Anthropology and Osteoarchaeology, 2010), but it was not been updated or expanded upon in the most recent revision.

These issues have been raised in current discussions through high-profile cases and news articles in popular media in relation to repatriation (Arenas and Pinedo, 2005; Sharifatmadari, 2019; Tallón, 2019), destructive sampling (Balter, 2017), digitization of human remains (Turnbull, 2007) and the development of identified skeletal collections (Francisco, 2016; Romanello, 2019). Likewise, the growing number of human taphonomy facilities (Herbert, 2018; Kirkey, 2019) and the trade in human remains (Etchenique, 2016; Hugo, 2016; Schwartz, 2019) have been raised as controversial issues. However in Argentina, the main discussions and ethical rethinking that have been presented in the scientific community, and that have reflected their impact on the media and social networks, are related to the removal, conservation and exhibition of human remains of Indigenous origin (Consejo Internacional de Museos, 2019; García, 2019; Halperín, 2005). These ethical challenges are now prevalent issues that need to be addressed by biological and forensic anthropologists. While some of these issues have not been extensively addressed in the published literature, they are becoming points of discussion amongst anthropologists (Squires, Errickson, and Márquez-Grant, 2019a).

The analysis and treatment of human remains affects various groups. Firstly, it involves the deceased themselves. In light of belief systems, more and more attention is being paid to what the rights of the dead are, particularly in humanitarian work in forensic contexts (Moon, 2014; 2019). Secondly, it involves the living who are closely related to deceased individuals. Among these are Indigenous communities, whereby the remains of their ancestors are housed in museums, universities and other similar institutions (Endere et al., 2014; Fforde, McKeown and Keeler, 2020; Loveless and Linton, 2019). Thirdly, the relatives of individuals whose bodies are found in identified collections or human taphonomy facilities must be considered (Henderson and Alves Cardoso, 2018; Williams, Cassella, and Pringle, 2019). Finally, the analysis and treatment of human remains can affect the scientific community itself, since unnecessary destructive sampling leads to the potential loss of valuable information for future generations of researchers (Squires, Booth and Roberts, 2019). In turn, inadequate conclusions made in such studies leads to the dissemination of knowledge that is not supported by rigorous enquiry (Halcrow et al., 2018).

This paper will consider current issues related to the creation and curation of identi-
Identified skeletal collections, the founding of human taphonomy facilities, destructive sampling, digitization, and the growing trade of human remains. The aim of this article is to highlight key ethical issues within anthropological sciences and, in particular, biological and forensic anthropology. Recommendations to overcome these challenges will also be proposed. This article aims to demonstrate both the need for greater dialogue between professionals, and the necessity to update codes of ethics and good practice guidelines based on the issues raised here.

Identified Skeletal Collections

Identified skeletal collections comprise of skeletonized remains of individuals where-by individual biographical data are known (Alves-Cardoso, 2019). These types of collections are usually called reference collections or documented collections, and their importance lies in the fact that they are fundamental in the generation and testing of age and sex estimation methodologies. Some of these collections have also made it possible to define the diagnosis of specific pathologies based on certain skeletal lesions (Henderson and Alves Cardoso, 2018). These methodologies and diagnoses are then applicable to archaeological and forensic remains, allowing the interpretation of past societies or the resolution of judicial cases. Although the main interest in the very first identified osteological collections was to record skeletal anomalies and to make anatomical comparisons between peoples from different regions of the world, today they are principally employed to explore population variability and, ultimately, facilitate important contributions in biological anthropology (Santos, 2019).

Collections of human skulls and skeletons with associated documentary information usually include data such as sex and age at death, though in some cases they also retain details regarding cause of death, place of birth, nationality and even professional occupation. The development of documented osteological collections began early in the northern hemisphere; for example, Portugal (Santos, 2018) and the United States of America (Hrdlička, 1918) have collections dating to the end of the nineteenth century, though this was not the case elsewhere (for a review of world collections see Henderson and Alves Cardoso, 2018, Santos, 2019 and Ubelaker, 2014).

In Latin America, a series of identified skeletal collections were created at the beginning of the twentieth century and were made available to international audiences. These included collections in Chile, namely the Subactual Collection of Santiago at the University of Chile (n = 1282) (Lemp Urzúa, Rodríguez Balboa, Retamal Yermani and Aspillaga Fontaine, 2008); and Argentina, such as the Lambre Collection (n = 445) in the Faculty of Medical Sciences, National University of La Plata (Salceda et al., 2009; 2012), and the Chacarita Collection at the University of Buenos Aires (n = 146) (Bosio et al., 2012), while other collections are currently being developed (see González and Aranda, 2019). Further examples of identified osteological collections have been founded in Mexico, for example the collection in the Faculty of Anthropological Sciences at the Autonomous University of Yucatán (n = 84) (Chi-Keb et al., 2013); and Colombia, namely the National Institute of Legal Medicine and Forensic Sciences Collection (n = 600) (Sanabria-Medina et al., 2016). In Brazil, information is currently being compiled with the aim of developing this type of collection to aid forensic anthropological investigations (Cunha et al., 2018; Francisco et al., 2017).

Many of the recently formed identified skeletal collections around the world are associated with the excavation of burial spaces in churches dating to the seventeenth to
nineteenth centuries, or with deceased individuals from hospitals whose relatives did not claim their bodies. However, most come from current municipal cemeteries (Santos, 2019). In such cases, the development of these identified collections is authorized by local legislation, since the exhumation of bodies that have been buried for several decades is a frequent process, particularly in cemeteries belonging to large urban conglomerates where there is a need to reuse burial space. In order to form an identified collection, it is also necessary to notify families of the deceased, and wait a set period of time for them to claim the remains. Once this period has expired, the administration of the cemetery has the authority to decide on their destination. These human remains may be deposited in a common ossuary, they may be cremated, or authorization may be granted for their inclusion in a reference collection for teaching and research purposes.

Investigations using identified skeletal collections must preserve the anonymity of the deceased (Henderson and Alves Cardoso, 2018). This will ensure that the same bioethical guidelines employed in biomedical investigations apply to these collections (Organización Panamericana de la Salud y Consejo de Organizaciones Internacionales de las Ciencias Médica, 2016) and will guarantee that projects wishing to create this type of collection, or studies that entail research on these assemblages, have the approval of local bioethics committees (Bosio et al., 2012; Salceda et al., 2009). However, this does not mean losing individual reference or information about the way in which human remains entered the collection (de la Cova, 2019). Good practice guidelines and codes of ethics used in biological and forensic anthropology highlight respectful treatment in the investigation of human remains. Furthermore, the guidelines published by the Consejo Internacional de Museos (2017) should also be considered since the curatorial processes are similar to those applied in biological and forensic anthropology.

Identified collections will continue to grow, provided legislation remains in force and curators of these collections are interested in developing them. This is the case of the Dart Collection, which was founded in the early 1920s in Johannesburg (South Africa) (Dayal et al., 2009). Here, curators have been modifying the composition of this collection since the end of the twentieth century as, initially, bodies were primarily obtained from unclaimed deceased individuals. Now, the collection only comprises of bodies that were donated and/or bequeathed through prior consent; this development has led to an ethical transition in the acquisition of bodies for study (Kramer, Hutchinson, Brits and Billings, 2019). Likewise, the contexts in which skeletal collections were created in the past are currently being studied, highlighting the situations of marginality and structural violence that allowed access to the remains of deceased individuals for anatomical studies (de la Cova, 2019).

The skeletal collections of museums founded towards the end of the nineteenth and early twentieth centuries in South America demand special consideration. These collections, which contain identified human remains, were created as a result of the military outpost of the Nation State (Farro, 2009). In Argentina, the development of these collections was promoted by directors of scientific institutions in collaboration with members of the Army, in the context of violent episodes, for example from battles, prisons and reducciones (Podgorny, 2019; Tolosa and Davila, 2016). In many cases, these remains were retained as part of collections belonging to different institutions and were exhibited in museums. At present, the remains are no longer exhibited (Sardi, Reca and Pucciarelli, 2015) and are being claimed (Huircapán et al., 2017) and returned to their ancestral communities (Ametrano, 2015a; Berón, Pegoraro and Correa, 2019). These changes have emerged due to the implementation of legislation regarding the treatment of Indigenous

The earliest repatriation cases in Argentina were those of identified individuals. The first repatriation occurred following the enactment of the Repatriation Law, which was issued in 1991 (23.940/91). In this case the Tehuelche chief, Inakayal, was returned to Tec-ka, Chubut (Endere, 2011; Endere and Ayala, 2012). A series of sweeping legal reforms (Endere, 2014) and modifications to institutional policies towards repatriation were necessary, as all claims had to be addressed within a legal framework whilst simultaneously recognizing the violent contexts from which the human remains were obtained to create the identified collections. Intensive dialogue between representatives from Indigenous communities, museum directors, independent organisations and advisers from scientific institutions took place and key points were consolidated and fed into new repatriation policies (Ametrano, 2015b; Sardi and Ballestero, 2017).

A final ethical challenge associated with identified osteological collections is related to the fact that, in the majority of cases, individuals did not give their consent for their remains to be studied by scientists (e.g. de la Cova, 2019; Hunt and Albanese, 2005; Rocha, 1995). This is in contrast to some of the more recently formed identified collections, which include the remains of individuals who donated their bodies to science (e.g. Kramer et al., 2019; Perreard Lopreno, 2006). Although, in some countries, legislation does allow unclaimed bodies to be exhibited in displays and used in research and teaching without the need for consent from the living, the deceased prior to death or their relatives (Alves-Cardoso, 2019; Squires, Errickson and Márquez-Grant, 2019b). However, this does not correspond to bioanthropological ethical guidelines that require consent (e.g. American Association of Physical Anthropologists, 2003; World Archeology Congress, 2019). Therefore, it is important for researchers and curators to clearly document whether the skeletons they are studying, or storing, belonged to individuals who gave their consent for their bodies to be used in this manner. This distinction will lead to greater transparency within the bioanthropology and heritage sector, and will also generate greater awareness of the wishes of the deceased and their descendants among those who handle human remains in identified collections (Winkelmann, 2016).

**Human Taphonomy Facilities**

Interest in studying the decomposition of human bodies has prompted the creation of human taphonomy facilities, also known as ‘body farms’. The first such facility was created in the United States of America, at the University of Tennessee in Knoxville, in 1980 (Bytheway, Connor, Dabbs, Johnston and Sunkey, 2015); since then another seven have been founded in the same country, one in Australia and one in the Netherlands (Blau, 2017; Christensen, Passalacqua and Bartelink, 2019). Despite the reactions that these facilities can cause, given how bodies are used in this type of research, this is one of the less controversial topics discussed in this article as a cadaver can only be used if the deceased (or their family) provide consent before death. Nevertheless, multiple concerns have arisen around the creation of these facilities (for a detailed analysis, see Williams, Cassella and Pringle, 2019).

One of the key issues associated with human taphonomy facilities is the replicability of results. In addition to the fact that sample sizes are very small, and each donor is unique in terms of their weight, height and lifestyle (e.g. diet, drinking and tobacco habits, health and drug use). Other variables, such as climate, soil type and scavenger activity,
further hamper the precision of the results generated from analyses and make it incredibly difficult to accurately repeat the experiment (Matuszewski et al., 2020). These points force us to reconsider the ethics of using human cadavers in taphonomy research given that the validity of the results is questionable, and much of what we can learn about decomposition can be obtained using faunal analogues (porcine proxies are typically used) (Black, 2017).

The creation of facilities dedicated to taphonomic studies that use human remains is not a topic of current debate for professionals in archaeology and forensic anthropology in Argentina. However, faunal analogues have been frequently employed in taphonomic and experimental studies (e.g. Gordón and Bosio, 2012, Gutiérrez et al., 2018) as well as in studies of cadaveric colonization processes (e.g. Aballay, Murúa, Acosta and Centeno, 2008). At a national level, the handling of cadavers is a particularly sensitive issue that has led to profound ethical debates in society; this is pertinent to both human remains from the times of the constitution of the Nation-State (as discussed in the previous section), and the desaparecidos during the civic-military dictatorship (Salado and Fondebrider, 2008). More recently, a number of regional morgues have been accused of falsifying the death certificates of several deceased individuals (Escobar and Prósperi, 2014; Procuraduría de Trata y Explotación de Personas, 2016).

There are currently a number of organizations that have developed proposals for the foundation of these human taphonomy facilities in a number of countries, including Canada (Cardwell, 2019) and Great Britain (Williams et al., 2019). For this reason, it is important that universal ethical guidelines and global deontological codes are adopted that define, at the very least, the way in which bodies will be acquired, the operating procedures of the laboratory, data collection protocols and the dissemination of research that will be communicated to the wider community (Black, 2017; Bytheway et al., 2015). That being said, the creation of this type of establishment is largely influenced by local legislation. The main determinants when founding a human taphonomy facility include cultural, religious and an array of social and political factors. If these types of establishments are to become the norm in taphonomic studies, forensic anthropologists must also justify their creation and clearly demonstrate, in peer-reviewed research, that faunal analogues are not adequate substitutes and they do not allow us to broaden our understanding of human decomposition and taphonomy.

**Destructive Sampling**

Anthroposcopy and osteometry are traditional forms of analysis used by biological and forensic anthropologists to create biological profiles of deceased individuals. However, some questions posed in the framework of an investigation cannot be answered by macroscopic methods alone. Over the last thirty years there has been an exponential rise in the use of invasive sampling and associated analyses to answer questions regarding mobility, diet, kinship, health and disease and post-depositional taphonomic processes. Techniques, such as biomolecular analyses (e.g. DNA and stable isotope analysis), radiocarbon dating and histological analysis, require destructive sampling. This raises ethical concerns about the preservation of human skeletal remains for future generations.

Unnecessary invasive sampling of human remains and costly analyses can occur when there is a lack of open dialogue and collaboration between bioarchaeologists, geneticists and biomolecular archaeologists. For example, bioarchaeologists are essential on projects that involve the study of human remains since they are trained to identify patho-
logical lesions and generate biological profiles. However, destructive sampling studies have been carried out which resulted in unnecessary analyses and inadequate conclusions, all of which could have been avoided by collaborating with bioarchaeologists or specialists in biological anthropology (e.g. Bhattacharya et al., 2018; Halcrow et al., 2018). Similarly, the use of biomolecular techniques to confirm osteological observations, such as sex determination (Hedenstierna-Jonson et al., 2017), and unfocused, exploratory analyses lacking clear objectives (e.g. Hershkovitz et al., 2008; Wilbur et al., 2009) add little to our understanding of the past.

To avoid these issues from arising, macroscopic observations should always be performed before biomolecular and histological techniques. It is recommended that osteological results are verified or analysed by two biological anthropologists, as this will increase the precision and confidence in the results generated through macroscopic observations. This approach is adopted by forensic dentists. These specialists work in pairs to ensure observations and records are accurate, detailed, complete and recorded in a standardized manner (Berkerta, James and Lake, 2011). If this is not possible, biological anthropologists should follow the procedures employed by forensic anthropologists. Here, if forensic anthropologists are working alone, they must check that all anthroposcopic and osteometric observations are correct before proceeding with destructive sampling; findings must be verified by analyzing the remains one final time prior to releasing information about a case (Interpol, 2018).

Over recent years, concerns have been raised around the lack of consent and permissions required to collect skeletal samples using destructive sampling methods (Advisory Panel on the Archaeology of Burials in England, 2013; Henderson, 2007; O’Rourke, Hayes and Carlyle, 2005; Tarlow, 2006). Some faith and Indigenous groups are opposed to destructive sampling and any associated biomolecular and microscopic analyses of human bone (Squires et al., 2019). This is particularly pertinent when scientists wish to carry out DNA analysis of human remains that belonged to members of Indigenous groups, recently deceased individuals, excavated human remains or skeletal remains housed in museums or universities (Jones and Harris, 1998; O’Rourke et al., 2005; Walsh-Haney and Lieberman, 2005). In all cases, open dialogue between Indigenous communities, faith groups, curators and scientists is essential to ensure the beliefs of the living and deceased are respected (Colwell, 2017; ENOTPO, 2014).

Sampling human remains for biomolecular and microscopic analyses should not be solely carried out to satisfy the curiosity of the researcher; instead they should be used to answer highly focused research questions and address current debates. For example, these forms of analysis can broaden our knowledge of migration patterns of ancient populations (e.g. Nakatsuka et al., 2020), they can aid in the individual identification of skeletal remains housed in museums (e.g. Dahinten et al., 2020) or facilitate research on individual remains that will be repatriated and buried (provided consent is acquired wherever possible) (e.g. Márquez-Grant, 2020). Typically, when samples are taken from human remains that are housed in academic institutions or museums, consent and permission to conduct destructive sampling comes from the institutions themselves (Crespo, Dejean, Postillone, Lanata and Carnese, 2010). This is an antiquated model and requires urgent review in collaboration with all relevant stakeholders.

In Argentina, the National Meeting of Territorial Organizations of Indigenous Peoples has developed a protocol that stipulates that there must be a free and informed consultation with Indigenous Peoples before starting any project that affects Indigenous groups and/or their territories (ENOTPO, 2014). However, the participation and collaboration of
community members and professionals from different scientific associations has achieved disparate results (Endere et al., 2014). Furthermore, it should be taken into account that, although national and provincial laws define what can, or cannot, be done within specific legal frameworks, they may contradict each other (Endere, 2018; Rodríguez, 2013).

In the province of Chubut, the recovery of human remains from archaeological sites is regulated by Provincial Law V N° 160 (2018). This law outlines a protocol for the treatment of archaeological human remains. The protocol calls for the creation of a commission, involving both professional organizations and representatives from local Indigenous groups, for the protection and preservation of human remains (e.g. developing procedures for verification and field work). This legislation was developed jointly by the Ministry of Culture, the Judiciary, scientists (archaeologists and biological anthropologists) from the National Patagonian Centre, the Directorate of Indigenous Affairs and representatives of Native communities. Human remains were frequently discovered, by chance, in this region. This led to many years of rescue excavations and, ultimately, resulted in the aforementioned piece of legislation. Following each discovery, archaeologists and biological anthropologists liaised with local communities, who requested that the skeletal remains were not analyzed as it was deemed to be desecration (Gómez Otero, 2011). However, there are other cases in which communities have explicitly requested the assistance of scientists for the recovery and study of human remains (Fabra and Zabala, 2019a; 2019b; Salceda, Desántolo and Plischuk, 2015). This has given rise to spaces for the creation of new stories in the framework of the Indigenous re-emergence (Fabra and Zabala, 2019a; 2019b). These examples show that, despite tensions between those involved in these cases, issues associated with the ethics of sampling human bone, from a practical, cultural and ideological perspective, can be overcome when there is proactive dialogue between all stakeholders.

There is greater need for transparency regarding the ethics of destructive sampling and associated analyses in publications. Scientists using these techniques should acknowledge that ethical approval had been sought in all research outputs; at present this is very rare (e.g. see Carroll and Squires, 2020; Crowder, Montgomery, Filipek and Evans, 2020). Indeed, this should be a prerequisite (akin to medical journals) when publishing in bioarchaeology, and biological and forensic anthropology journals (Aranda et al., 2014; Squires et al., 2019a). Changes to publication requirements will demonstrate that ethical considerations within bioarchaeology, genetics, and biological and forensic anthropology are taken seriously by those working in these fields of research. Furthermore, it is necessary to increase the number of research ethics committees (whilst simultaneously strengthening pre-existing commissions) that grant the ethical approval of projects, the use of skeletal samples and subsequent publications.

Digitization of Human Remains

The rapid development of digital technologies has facilitated new ways to record and analyze human remains. This has consequently led to an increase in the use of digital images by bioarchaeologists, biological and forensic anthropologists and museum curators. Digital images are created by scanning human remains with laser scanner technology, or CT scans may be used. The resulting 3D images allow specialists to carry out various analyzes (e.g. measurements) without having to physically manipulate the remains. These images can also be used in court proceedings (Errickson, Thompson and Rankin, 2014) or as a means of public outreach, both online (Digitised Diseases, n.d.) and in museum exhibitions (Smith and Hirst, 2019).
Over the past three decades, the pressure to repatriate human remains has increased significantly. Some specialists working in bioarchaeology have raised concerns about the loss of information once bones are repatriated and reburied. Therefore, the creation of permanent digitized records (e.g. digital images and three-dimensional replicas of said images) are seen as a possible solution (Clegg, 2020). However, ethical concerns arise about the use of digital images, particularly among Indigenous groups. One such case took place in November 2006, when the Tasmanian Aboriginal Centre requested the repatriation of seventeen Indigenous Tasmanians that were stored in the Natural History Museum in London (United Kingdom). The museum repatriated these individuals, but first generated information through digital images and molecular analysis (Turnbull, 2007). While this could be of value to future generations interested in studying human origins and diversity, the explicit requests made by the Tasmanian Aboriginal Centre (not to take digital images or perform molecular analyses on the human remains) were not respected (Turnbull, 2007). Despite this, there are other cases where those working in the archaeological and bioanthropological heritage sector have successfully collaborated with Indigenous groups in Canada and New Zealand (Brown and Nicholas, 2012; Resta, Roy, de Montano y Christal, 2003). These examples demonstrate that the joint management of digital images of human remains can be beneficial to all concerned. Needless to say, greater consideration and dialogue with Indigenous groups is essential when creating digital records. Scientists should not favor their desire to create permanent digital images of the dead over the worldviews and beliefs of other societies, descendent communities and families.

In Argentina, there is currently a trend towards digitization, and there are several projects in development that focus on archaeological collections (Izeta and Cattaneo, 2016). The production of digital images of human remains is restricted to those that are being used in research, particularly in projects whereby skeletal elements will be subjected to destructive sampling and, at the Museum of La Plata, human remains that will be repatriated with the consent of community representatives (Marina Sardi and Mariano Del Papa, personal communication, May 11, 2020). A number of limitations have prevented the digitization of greater quantities of human remains. These include: the lack of technology needed for digitization, the time intensive nature of this process, the dearth of staff needed for its implementation and the legal restrictions for its subsequent dissemination for scientific purposes (González and Beguelin, 2013). However, costs of the required technology needed for digitization is slowly getting smaller, there is greater accessibility to digitization instruments and there is an ongoing trend towards more open access resources. Each of these points raises ethical considerations regarding the digitization of human remains.

The production and reproduction of digital images of human remains and their associated 3D replicas give rise to questions about the "ownership" of such pieces. In the past, the institution in charge of the remains, and the specialists who produced these images, were deemed the owners of digitized images (Scott, 2018; Smith and Hirst, 2019). However, less attention was paid to descendants and Indigenous groups who could claim ownership of these images given their relationship with the deceased. In Argentina there is conflict between property laws and the rights of Indigenous Peoples (García-Mancuso et al., 2019; Sardi, 2011). The challenges associated with the property of cultural heritage belonging to Indigenous communities were expressed in the Declaración de Río Cuarto (2005). This issue is extremely complex. Even though skeletal and mummified remains found in Indigenous territories could be stored and studied in museums and archives, it did not permit these institutions to use the remains as they pleased (e.g. taking digital images of human remains or conducting destructing sampling).
Digitalization itself is not considered in any law that refers to human remains in Argentina. Legal issues around heritage and human remains must be addressed before in-depth discussions around digitization of human remains take place. In Argentinian law, National Law 25.197 (1999) defines “cultural property” as all objects, beings or sites that are the expression or testimony of human creation, which have an exceptional archaeological, historical, artistic, scientific or technical value. In 2003, National Law 25.743 was issued. This law established that archaeological heritage comprises of movable and immovable evidence, in all forms, that can provide information on the socio-cultural groups that inhabited Argentina. It also grants universities and scientific organisations the protection, preservation and control of archaeological and paleontological heritage. This piece of legislation has proven challenging in its application and needs updating in light of these difficulties (Endere, 2018).

Only National Law 25.517 (2001) specifically mentions the human remains of Indigenous groups. This piece of legislation stipulates that Indigenous Peoples and/or communities that claim the ownership of human remains must be granted this request and the remains made available. In Article 3 of the same law, it is noted that all scientific research that involves the analysis (including digitization) of Indigenous human remains must have the express consent of said communities. National legislation classifies human remains as heritage more broadly and turns the dead into objects. Consequently, said “heritage” is handed over to scientists and communities, though this is dependent on different regulations (Rodríguez, 2013). Questions raised about the treatment of human remains, and contradictions in regulatory framework are part of the current ethical challenges that require immediate consideration. For example, what if human remains cannot be linked to an Indigenous group(s) or descendants? Do scientists have the right to take digital images of these human remains? Should scientists treat unprovenanced human remains and, indeed, any associated images differently to those that have known direct kin? There is a clear lack of legislation and best practice guidelines pertaining to these issues. To overcome these challenges, global collaboration and discussions between bioarchaeologists, heritage professionals and Indigenous groups is essential for these questions to be addressed successfully.

The Human Remains Trade

Human remains (in different states of completeness and preservation, e.g. mummified or skeletonized) and other objects made from human tissue from archaeological and ethnographic contexts have been traded for many centuries (Eckstein, 2018; Spennemann, 2006). The British Association for Biological Anthropology and Osteoarchaeology (2017, p. 1) stipulates that it “is ethically objectionable to trade human remains as objects ...”. It is extremely difficult to regulate the trade of human remains; this is further compounded by the lack of legislation on the “ownership” of such remains (Aranda et al., 2014; British Association for Biological Anthropology and Osteoarchaeology, 2017; Endere, 2018; Huffer, Chappell, Charlton and Spatola, 2019). Over the last decade, the exponential rise of online social networks has facilitated this trade around the world (Huffer and Charlton, 2019; Huffer and Graham, 2017; Huffer et al., 2019). Social media companies (such as Facebook and Instagram) do have terms of use that members are expected to follow; these typically stipulate that illicit activity is prohibited on these sites, though these are vague (Huffer and Charlton, 2019). Research by Huffer and Graham (2017) and Huffer et al. (2019) show that social media users are flouting these rules. This, in part, could be attributed to the va-
gueness of the terms of use (e.g. these rules note that users should be familiar with local and national legislation, but no further information is provided), legislative loopholes and the fact that these activities are not monitored, nor are the terms of use enacted (Huffer and Charlton, 2019). Huffer and Charlton (2019) have highlighted that buyers and sellers frequently make enquiries on the internet about the authenticity of human remains. These individuals ask different specialists - bioarchaeologists, biological anthropologists and forensic anthropologists, among others - to identify the difference between real human remains and forgeries (Huffer and Charlton, 2019). It is imperative that specialists do not assist these vendors, but rather follow protocols for reporting such enquiries.

Unfortunately, at present, there is no official procedure to report human remains dealers to social media companies. Therefore, it is clear that representatives of such companies must work closer to justice and security forces to develop a system by which users can easily report the activities associated with this illicit trade.

In Argentina, National Law 25.743 (2003) was enacted with the aim of stopping archaeological sites from being looted and preventing the theft of collections by treasure hunters (Endere and Ayala, 2012). The sale of goods classed as archaeological or paleontological heritage is illegal, and the provinces and the Autonomous City of Buenos Aires are empowered to adapt their laws to prevent breaches and enforce sanctions on criminals. In addition, the National Institute of Latin American Anthropology and Thought (INAPL) is responsible for the enactment of this regulation and is in charge of the registry of archaeological assets.

However, recent attention has been drawn to the lack of criminal legislation that considers the desecration or damage to human remains (Negrete, 2018). It is clear that there is a legal vacuum in terms of the trade of such remains, for example at the national level the penalty for stealing a cadaver is only legally admissible if it involves extortion for its return (Law No. 11.179, Article 171, 1921). Thus, although there are provincial regulations that consider desecration, only light penalties are imposed.

Recent complaints about the trade of human remains in Argentina have primarily focused on cases related to university students, particularly those studying medicine, dentistry and physiotherapy, who buy them to support their studies in human anatomy. This illegal trade is centralized in some local cemeteries. In these cases gravediggers and employees with access to skeletal remains act as vendors (Etchenique, 2016). This trade is a recurring problem in university cities and has caused enormous inconveniences to the administration of cemeteries of large municipalities. Currently, university osteology reference collections and registered loans are made available to students in cemeteries, though inconsistent organizational structures have meant that access to these human remains is inconsistent and uncoordinated. Therefore, it is necessary to create adequate facilities that are staffed by personnel responsible for regulating the use and storage of these remains, as well as ensuring they are appropriately treated and returned by students.

CONCLUSIONS

Despite the fact that biological and forensic anthropologists are becoming more proactive in terms of addressing ethical issues within their disciplines, there is still a long way to go. It is clear that both emerging ethical challenges and those that have been discussed for a long time should be incorporated into codes of ethics and good practice guidelines. However, it takes a long time for organizations to make such changes and
these do not occur on a regular basis. This article has highlighted a number of current ethical challenges that bioarchaeologists and forensic anthropologists face in their work. The identified skeletal collections that exist in several countries, such as Argentina, Brazil, Colombia and Portugal, are extremely valuable as they allow scientists to test the reliability and precision of the methodologies used in their work. However, ethical concerns relating to the acquisition of human remains for research purposes have been raised and need to be addressed.

The rise of human taphonomy facilities around the world may provide some answers to questions about post-mortem interval and taphonomic processes. However, anthropologists must ensure that the use of such facilities is justified on the basis of sound scientific research and all other avenues of enquiry have been exhausted.

Destructive sampling is needed to conduct biomolecular (e.g. DNA and isotope analysis) and histological studies. These analyses allow anthropologists to answer questions that cannot be addressed by traditional osteological methods alone. However, problems arise when there is a lack of communication and collaboration between biomolecular specialists and anthropologists, for example unnecessary sampling and the absence of osteological analysis, as some questions can be answered by anthroposcopic and/or osteometric assessment. Similarly, there is all too often a lack of dialogue and consultation between scientists and heritage professionals (who employ destructive sampling methods and digitize human remains) and members of Indigenous and religious groups. This results in strained relationships between stakeholders and generates distrust of the entire scientific community.

Finally, the trade of human remains is a global problem; over recent years this has been amplified due to the rise of social media networks. This is further compounded by the fact that these companies do not make their terms of use explicit in their commercial transaction guidelines nor do they reinforce them. Furthermore, there is an evident lack of local and national legislation pertaining to the trade of human remains; this in turn raises further difficulties when trying to quash the commercialization of skeletons and individual bones.

Respect for the deceased, their families and communities (in terms of their belief systems, identities and wishes) must lay at the center of all work involving human remains. Based on the ethical concerns raised in this article, some practical recommendations are made for those working in biological and forensic anthropology:

- Ethical guidelines and good practice documents around the world need to be regularly updated in light of current ethical challenges. Collaboration between bioarchaeologists, and biological and forensic anthropologists on a global scale is essential, as this will ensure guidelines are consistent which will improve ethical standards within these disciplines;
- Identified skeletal collections that are mainly comprised of unclaimed individuals must be protected by local legal frameworks. These collections should only be formed with prior consent of the deceased, as is the custom in some parts of the world. This will ensure the establishment of collections is ethical. Likewise, the origin of human remains in these collections should be recorded and made explicit each time they are studied;
- Human taphonomy facilities should receive human remains from individuals who have signed prior consent. Since there is no international legislation pertaining to the donation of bodies for the purpose of taphonomic research, a series of common ethical guidelines should be agreed upon by the disciplines concerned. The eventual creation of this type of establishment should be discussed within each society since the diffe-
rent social and political trajectories will influence whether these facilities are founded or not, as well as how they are operated;

Before performing destructive sampling, it would be beneficial to verify findings generated through osteological analyses, either by the same anthropologist or by a second anthropologist. This could avoid unnecessary destruction of skeletal remains;

Scientists must begin to report that ethical approval, for any research involving destructive sampling, was granted in academic articles. This approval should be granted (prior to commencing each project) by the institutions responsible for housing the remains and also where sampling and associated biomolecular and microscopic analyses are carried out;

Greater dialogue with Indigenous groups is essential as this will ensure the wishes and beliefs of the deceased and their kin are respected. Such collaborations will also lead to more robust ethical guidelines concerning the destructive sampling of human remains (e.g. DNA and isotope analysis) and the production, storage and dissemination of digitized images and associated 3D replicas;

The ownership of digitized images (and 3D replicas) of human remains needs to be discussed in light of surviving kin, as opposed to sole ownership belonging to either the curating institute or the specialist that creates the digitized images;

Greater cooperation and collaboration is required to prevent the online trade of human remains. Social media companies, law makers, police forces and anthropologists must work together to develop an efficient means of reporting illicit activities. All parties need to be actively involved in reporting incidents, monitoring online activity and ensuring terms of use are clear with no evident loopholes.

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