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Barra O'Donnabhain
María Cecilia Lozada *Editors*

Archaeological Human Remains
Global Perspectives

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Archaeological Human Remains

Global Perspectives

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About the Editors

Dr. Barra O'Donnabhain who holds a Ph.D. degree in Anthropology from the University of Chicago, is an Irish bioarchaeologist who has been conducting archaeological research in Ireland and other parts of the world for over 25 years. His publications cover a wide temporal span as well as a broad range of themes but are characterized by an integrative approach in their reconstructions of past lives. This is exemplified by recent papers dealing with the political use of the ritualized violence of public executions (2011) and the role of the quotidian use of material culture in the construction of identity in Viking Age Dublin (2013). He co-edited the volume "The Dead Tell Tales" that was published by the Cotsen Institute of Archaeology Press at UCLA (2013). O'Donnabhain has directed and collaborated in archaeological projects in a number of world areas. His recent focus has been on institutional confinement. From 2009 to 2011, he directed excavations at a putative leper hospital in south–west Ireland and in 2012 he began excavations at the nineteenth-century prison at Spike Island, also in Ireland. Also in 2012, he directed the mortuary component of excavations at an Inca outpost in southern Peru in collaboration with researchers from UCLA and USC. He is currently on the faculty of the Department of Archaeology at University College Cork and is on the Board of Directors of the Los Angeles-based Institute for Field Research.

Dr. María Cecilia Lozada is a Peruvian bioarchaeologist who has been conducting archaeological research in the South-Central Andes for the last 20 years, and holds a Ph.D. degree in Anthropology from the University of Chicago. She uses a multidisciplinary approach to study the past, combining archaeology, human osteology and ethnohistory, which is exemplified in her book: "El Señorío de Chiribaya en la Costa Sur del Perú" (2002) and multiple publications that showcase her integrated social and biological reconstructions of past Andean societies. In 2013, she co-edited the volume "The Dead Tell Tales" that was published by the Cotsen Institute of Archaeology Press at UCLA. For the past 7 years, Lozada has been the main field archaeologist and human osteologist for several multidisciplinary and collaborative projects in northern Chile co-sponsored by the Cotsen Institute of Archaeology at UCLA and La Universidad de Chile. In 2009, she initiated a new archaeological project in the Vitor valley in southern Peru. As the Principal Investigator of the Vitor Archaeological Project, Lozada leads a multinational team that includes Peruvian investigators as well as

numerous American students and researchers from institutions such as UCLA, the Field Museum of Natural History in Chicago and The University of Chicago. She is currently a Research Associate in the Department of Anthropology at the University of Chicago, and has been actively working to promote collaborations between local universities in Peru and the United States through her projects.

Chapter 1
To Be or Not to Be: Global Approaches to Ancient Human Remains

Barra O'Donnabhain and María Cecilia Lozada

Ancient human remains have long been a source of both fascination and contestation. Their appeal is multifaceted and has complex origins. It is based partly on the human enthralment with the issue of mortality. The dead provide learning moments for the living, and it is common to reflect on the self when contemplating the material remains of people from the past. It is not surprising then that in archaeology, the study of human remains is as old as the discipline itself, but this relationship has had chequered histories in different world areas. This is partly due to the diversity of origins of skeletal research in discourses such as anatomy, medicine, racial studies, and evolutionary biology, while in some countries, the influence of non-western traditions of science has also shaped the development of approaches to ancient human remains. As a result of these diverse histories, archaeological human remains have been used as the basis for a range of narratives such as human evolution; tracking ancient diseases; human variation; past migrations; and the reconstruction of past lifestyles. In some settings, human remains have provided the basis for politically motivated narratives of ethnogenesis, while in other countries, self-conscious attempts to characterize the nation as modern and civilized have produced a selective blindness to remains associated with the local past. Similarly, the appropriateness or otherwise of the retrieval, analysis, and long-term curation of human remains has provoked controversy in some world areas but not in others, while in some contexts, forensic approaches have emerged as an important element in conflict resolution. In this context of diverse responses to archaeological human bone, this volume is a contribution to an ongoing dialogue concerning ancient human remains.

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The volume examines past, current, and future directions in studies of archaeologically retrieved human remains by presenting sixteen country profiles drawn from six continents. This broad view is timely when considered in the context of other recent global surveys. In the volume edited by Márquez-Grant and Fibiger (2011), the primary emphasis was on the legal status of archaeological human remains. The recent compendium edited by Buikstra and Roberts (2012) deals specifically with the study of past diseases. In turn, the focus of the current volume is on the diversity of attitudes to archaeological human remains, and it traces the roots of research traditions and current academic trends. The central theme of this volume was initially discussed at a session held at the 73rd annual meetings of the Society for American Archaeology in Vancouver, Canada in 2008 and grew out of our own educational and research experiences. Both having backgrounds in conventional archaeological studies in Europe and South America, respectively, we pursued our graduate education in bioarchaeology in North America. Our combined fieldwork and research experiences span four continents and a multitude of cultural settings, both past and present. In the 25 years that we have been involved in the discipline, we have witnessed many changes both in theory and praxis. As the discipline grew in the 1990s and 2000s, there were attempts to standardize methodological approaches and produce codes of practice (e.g. Buikstra and Ubelaker 1994; Mays et al. 2002; Brickley and McKinley 2004). The Vancouver session posed the question of whether these trends were leading to a convergence globally in approaches to archaeological human remains or whether significant differences remained between practitioners in different countries. The sixteen case studies in this volume provide internal perspectives of each jurisdiction. The contributors were asked to document the historical trajectory of ancient human bone studies in their country while also exploring current trends in the study of skeletal remains and outline future directions.

In Argentina (Chap. 2), at the turn of the twentieth century, European scientific knowledge was fully embraced by local academic traditions with government encouragement. While the country has significant indigenous populations, the process of the consolidation of the nation-state ignored this cohort in a process of identity formation that stressed the European background of Argentina. In this sociopolitical context, museums engaged in the systematic collection of indigenous human remains with the aim of documenting the Otherness of the aboriginal population. José Imbelloni, an Italian-born physical anthropologist who arrived in Argentina in 1921, dominated the theory and practice of the study of archaeological human remains for many decades. In a strict adherence to pre-war European traditions, most of his studies were concerned with developing racial typologies in an attempt to understand the prehistoric peopling of the Americas. Political instability, in the form of many dictatorships, constrained the emergence of other voices, and Imbelloni's influence lasted until the transition to democracy in the 1980s when Argentinian scholars and international researchers developed collaborative and interdisciplinary projects to study the past through the contextualized examination of mortuary studies and human remains. Today, Argentinian indigenous communities

are actively involved in archaeological and bioarchaeological research programs with the support of government, academic institutions, and researchers.

The history of Armenia (Chap. 3) has been shaped primarily by its geographical position at the crossroads between Europe and Asia. As in many other countries, physical anthropology in Armenia was rooted in nineteenth-century Western European anthropology. Early typological studies were conducted in order to interpret the origins and migration routes of putative Indo-European peoples. With cranial morphology as the basis of interpretation, these early studies made use of both archaeological crania and the heads of the living population. Efforts were made to define the relationship between prehistoric collections and historic groups, and terms such as 'Armenoid' were coined to emphasise the distinctiveness of the population. While there were some differences in emphasis and interpretation, nineteenth-century scholars linked modern Armenians to ancient Indo-European and near-Eastern ancestors. After the foundation of the Soviet Union, Armenian physical anthropology was isolated from the non-Soviet world for almost 70 years. While cranial studies remained the basis for research, interpretations changed to argue for an autochthonous development, typical of Soviet ethnogenesis approaches. In addition to osteological data, geographical, linguistic, psychological, environmental, and genetic dimensions were included in this model. Since the 1990s, osteological studies in Armenia have begun to move beyond this deep-rooted tradition to include biodistance studies based on non-metric traits, the analysis of population dynamics by examining palaeodemographic profiles, and palaeopathology. Furthermore, new practices including systematic mortuary excavation and concern with the complete skeleton rather than just crania are slowly but steadily being embraced while international collaborations are increasing.

Australia's case (Chap. 4) differs from most of the countries included in this volume in that the curation of archaeological human remains is generally not now permitted. Used initially to address origins and evolutionary processes prior to the presence of Europeans, osteological material was also sought to link ancient remains and aboriginal people who were characterized as 'living fossils'. The geographical isolation of the continent was considered to make it an ideal laboratory to study such topics, and this early period of research was characterized by a link between archaeology, physical anthropology, and ethnography. These early collaborative efforts in the study of ancient human remains changed significantly in the early 1950s as archaeology became linked with departments of history while biological anthropology became the domain of anatomists. This separation was not purely institutional but also grew out of debates regarding the link between biology and culture. Debates regarding biological variation continued until the 1980s with limited consideration of cultural attributes. Attempts in the 1960s and 1970s to overcome this separation between archaeologists and biological anthropologists were not successful. It was only in the 1980s that a new generation of biological anthropologists managed to bridge the gap between the disciplines. This coincided with calls from indigenous groups for the repatriation of human remains and other

materials. The separation between physical anthropology and archaeology remains a feature of Australian academia. Human remains are today studied in situ, and the focus is on the development of osteobiographies, which are shared with local communities. While this may not be the ideal situation for population-based approaches, Littleton highlights the often malleable nature of biological anthropology in its efforts to connect the present to the past.

The National Museum in Brazil (Chap. 5) has played a vital role in the study of archaeological human remains. This institution was established by the Portuguese regent in 1808 soon after the royal family arrived in Brazil having fled from Napoleon's armies. This is similar to developments in Europe, where many national museums were established around royal collections. This institution remained the driving force behind the collection and various analyses of archaeological human remains from Brazil throughout the nineteenth century and into the early years of the twentieth. These analyses were carried out by medics and primarily concerned with craniometrics and were heavily influenced by both French and German traditions. In the early-twentieth century, there was a paradigm shift towards a concern with the living that centred on the issues raised by the eugenics movement with a strong focus on the African component of the Brazilian population. This mirrored similar contemporary anxieties about 'racial purity' in the USA and Europe. The National Museum played an important role in emphasizing the regard for archaeological bone from the 1960s with work of Alvim whose non-medical background also marked a break with the past. However, this period of military dictatorship stifled developments in anthropology and related discourses. The situation improved in the 1970s which saw a spectacular flourishing of anthropological teaching with programs developed in over forty-third-level institutions and recognition of the importance of the four field approach. While the inclusion of physical anthropology in curricula did not produce immediate results, it laid the groundwork for further advancements in the discipline. This included a strong emphasis on palaeopathology that was driven in part by efforts to deal with tropical diseases endemic to Brazil. This South American example parallels the socially sensitive approaches to archaeological human remains in Mexico (Chap. 12), where skeletal research is understood to have a direct benefit for the living. Brazil presents a dynamic scenario of a complex and robust engagement with archaeological human remains. Since the return to democracy in the 1980s, there has been a move from a vibrant local development to strong international engagement with major contributions across a number of different branches of the discipline. Mendonça clearly labels the approaches of the last three decades as bioarchaeology in the North American tradition.

Shifting the spatial scope of discussion, Brothwell documents the historical trajectory of approaches to archaeological human bone in Britain (Chap. 6). This follows a similar path to those seen in other world areas documented in this volume with antiquarian origins giving way to more science-based approaches in the mid-nineteenth century. From this period until World War II, the discipline was dominated by biometrical studies with some important methodological

contributions such as those of Pearson regarding the estimation of stature, as well as the development of enduring narratives about population history. Reflecting the British adherence to Clark's (1972) definition of the term 'bioarchaeology' as referring to environmental archaeology in general, Brothwell uses the term 'human bioarchaeology' here to refer to post-war developments in the study of archaeological human remains. He notes that there was a gradual broadening of research agendas and a move beyond craniometric approaches. Since the 1980s, there has been strong growth in interest in archaeological human remains and this is reflected in the increase in postgraduate programs centred on such phenomena (Roberts 2006) and the publication of important theoretical contributions to the discipline (e.g. Sofaer 2006). In particular, Brothwell notes the recent impressive output in the field of palaeopathology. While reburial and repatriation are themes that emerge in many of the other papers in this volume, this has mostly occurred in the context of post-colonial societies. Brothwell notes that Britain has not been immune to these developments. He anticipates the transformation of the discipline and its narratives as a result of advances in bone chemistry and biomolecular approaches to the past.

Physical anthropology in Canada (Chap. 7) has analogous mid-nineteenth-century origins and not surprisingly, the discipline there was predominately rooted in British approaches although through the work of Franz Boas, Canada was also influenced by the German school. As in many other countries, the discipline in Canada was dominated by medics and anatomists until the second half of the twentieth century. The context-sensitive work of Anderson in the 1960s was contemporary with similar developments in the USA. Canadian anthropology was very much an extension of the study of living peoples (First Nations), while in more recent decades, the international nature of bioarchaeology in Canada also parallels that of its southern neighbour. While there are many similarities and overlaps with the experience in the USA, Canada distinguishes itself through a distinctive history of the discipline as well as a unique trajectory for its development. Additionally, a divergent legal framework, the key role played by the National Museum of Canada and ultimately, the earlier cooperative engagement with indigenous people point to Canada as a distinct situational context for bioarchaeological research.

Greece (Chap. 8) presents a particular case study as a country that has played a major role in the Western archaeological imagination and home to many international schools of classical archaeology. The allure of the classical world drew many researchers from abroad including the German, French, and British in the nineteenth century with the addition of American scholars in the first half of the twentieth. It was in this period that vital institutions such as the Museum of Anthropology in the late-nineteenth century and the first university chair in anthropology in the twentieth century were established and began the study of human remains in Greece. Despite the presence of the international schools of archaeology and significant numbers of researchers, these foreign scholars and their discourse contributed little to developing the local study of human skeletal remains (see Chap. 13 for a similar situation). The foundation of local research in ancient human bones was primarily a product of local political and social

transformations that accompanied the return to democracy in 1974. Substantial institutional change followed including the separation of physical anthropology from medicine and proactive engagements with biology, history, and, later, archaeology. The latter process was heavily influenced in the 1990s by local scholars seeking training abroad. Since these educational developments in the 1990s, bioarchaeological research has blossomed in Greece. With the classical past playing a key role in Greek and more generally in Western identities, the country has a long history of cultural heritage management, though in this monument- and artefact-rich environment, the position of archaeological human remains has not been optimal. Lagia and co-authors argue that there are significant needs for institutional investment in this area, both in terms of personnel and facilities so that present and future generations can access the scientific potential of skeletal remains. This needs to take into account the potential symbolism such remains have for living communities.

Iceland (Chap. 9) was settled by Europeans in the last centuries of the first millennium AD, and this process was described in detail in thirteenth-century sagas. As a result, historical narratives have dominated Icelanders' view of the past. The nineteenth-century acceptance of the saga narratives as historically accurate may account for the absence of visiting physical anthropologists during the heyday of typological analyses elsewhere. This acceptance also constrained the development of archaeology, which was expected to confirm narratives already in place. Gestsdóttir illustrates how archaeological research in Iceland has been structured around historical accounts of the landscape. It is not surprising so that the sagas' preoccupation with origins has also been reflected in archaeology. While there was little or no analysis of human remains in the nineteenth century, pre-Christian skeletal material was curated from the time of the foundation of the National Museum of Iceland in the 1860s. Studies of archaeological human bone were dominated in the twentieth century by the work of the anatomist Jón Steffensen whose research focused on origins of Icelanders as revealed by craniometrics and on diachronic changes in stature. Change occurred in the 1990s as a result of local students with a background in archaeology seeking graduate education outside the country, specifically in England. Gestsdóttir relates how the distinctive geology of Iceland makes it is an ideal location for isotopic studies of migration. Similarly, the development of Iceland as a centre for genetic research, based on the unique history of the population, its centuries of relative isolation, and its strong tradition of genealogy, has fascinating implications for archaeological human remains and their potential to inform such research. Gestsdóttir also describes research such as that focused on the examination of the impact of volcanism on health. It is interesting to note that other than within the discipline of archaeology, there is no discussion of the ethics of the excavation and long-term curation of human skeletal remains in Iceland.

The colonial experience was an important element in the formation of narratives of the past in India (Chap. 10). The need to understand the varying cultural and ethnic landscapes of the subcontinent was an important motivator for the colonial powers in establishing archaeological and anthropological surveys.

In common with narratives developed in other colonial settings, cultural change in the past was explained in terms of intrusions of more advanced foreign groups, thereby denying agency to indigenous peoples in terms of the capacity for innovation. Conflations of biology, culture, and language were used to define people of both past and present, while archaeology was seen as providing a window on invasion events with remains such as the non-formal burials at Mohenjo-daro representing key moments in the supposed Aryan incursion. This provided a subtle legitimacy to colonialism by suggesting that Europeans were just the latest in a series of more advanced outsiders to subdue the subcontinent. In the early decades after independence, many of these older narratives were refuted, with analyses of archaeological human remains playing an important role. In India, archaeology in general has often deferred to narratives developed in other disciplines though Mushrif-Tripathy outlines how recent work on population history has involved the rejection of models based on linguistics and she presents alternatives based on bioarchaeological analyses.

The colonial relationship with Britain was also central to the production of culture in Ireland (Chap. 11). As in other colonial settings, early researches involving archaeological human remains were transfixed by the issue of race and these studies played an important role in defining the indigenous population as Other. Similar to what occurred in India with the Aryans, ethnical-based conceptualizations of the native population of Ireland as Celts resulted in archaeology being called upon to confirm versions of the past that were already in place before the development of the discipline. Racialized and sectarian narratives became part of the canon of what was 'known' about the Irish past and about the origins of the living population. These were internalized by both colonized and colonizer and so perpetuated for decades after the colonial relationship had ended. Worryingly, such narratives have not entirely gone away and have resurfaced in some relatively recent works that have shown cavalier attitudes to context. The emergence of contextualised approaches to archaeological human remains in Ireland occurred in the 1980s and was initially driven by researchers trained overseas, first in the USA and later in Britain. As a result, two academic lineages dominate praxis of the discipline in Ireland: that of the North American bioarchaeology (specifically the 'anthropological question' tribe postulated by Rakita, this volume) and the British human osteoarchaeology. In common with other countries that have recent histories of political violence, bioarchaeologists have been active in forensic work in Ireland.

Tiesler and Cucina present a picture of a vibrant and robust school of bioarchaeology that operates in the Yucatan of SE Mexico (Chap. 12). The development of the study of archaeological human remains in Mexico was strongly influenced by the Spanish physical anthropologist Juan Comas (1900–1979) and the European tradition that formed his background. The study of archaeological human remains in the Maya region is a later development in the North American tradition that presents an interesting insight into a core/periphery relationship. As a result of the Comas connection, the capital has been dominated by a more traditional physical anthropological approach that has focused on the remains of

Mexican highland populations while the osteology of the Maya sphere, located in the country's southeast periphery, has developed along its own distinctive lines. In the highlands, the archaeology of the Aztecs and the associated physical anthropology have formed a central element in the construction of Mexican national identity. It was at the core of the *indigenismo* social and intellectual movement in Mexico linking the glories of the past with the modern state. In contrast, among modern Maya descendant communities, some disconnect is felt with their pre-Columbian ancestors. Tiesler and Cucina hypothesise that this is the final outcome of centuries of forced assimilation, a core element in the colonization strategies of the Spanish crown. They highlight the relevance of the skeletal record of past populations to achieving a diachronic perspective to public health in descendant communities. This socially sensitive approach is an important demonstration of the contribution of the discipline to attempts to understand and improve the rapidly changing living conditions among contemporary communities through the analyses of the dead.

Lozada introduces her chapter concerning Peru (Chap. 13) by highlighting the richness of bioarchaeological research in this part of the Andes in recent decades. However, this is a relatively new approach, as bioarchaeology developed in Peru in the late 1970s under the influence of leading American scholars who brought this academic tradition to the country. Prior to this period, the study of human remains from archaeological contexts was in the hands of a small number of Peruvian scholars, such as the archaeologist Julio C. Tello, as well as a number of physicians who were mostly interested in the history of diseases. As a result, the relatively continuous study of palaeopathology has made significant contributions to the knowledge of Andean medical anthropology and resulted in the establishment of palaeopathology as a subdiscipline in the medical school Cayetano Heredia in Lima. In contrast, bioarchaeology is a relatively novel import that is practiced today by a few Peruvians, trained mostly in the USA as there are no institutions that offer this academic track. Private institutions offer the only training and resources for local and foreign researchers in Peru. Despite the colonial history of the country, the excavation and long-term curation of archaeological human remains are not a source of contestation in Peru. In addition, forensic anthropology has been at the forefront of studies dealing with excavated human remains due to the political violence and instability over the last 30 years.

While many European scientists and institutions acquired Holocene human skeletal remains, particularly crania, from South Africa in the eighteenth and nineteenth centuries (Chap. 14), local collections of such remains are a late-nineteenth- and twentieth-century phenomenon and were derived from archaeological contexts. An important role was played by museums initially and, later on, by the universities that were founded in the early decades of the twentieth century. In the latter institutions, Morris relates how physical anthropology was linked to anatomy in medical schools and separated from social anthropology. The latter was split into two distinct strands: the Social Darwinist 'volkekunde' approach of the Afrikaans-speaking universities and the comparative approach of the English-speaking colleges. The 'volkekunde' approach provided the

intellectual underpinning of the apartheid policy of racial segregation. While South African physical anthropologists did not comment on apartheid as it was gradually introduced in the 1950s, their typological models of human variation and silence provided tacit support. The social and political context changed with the end of the apartheid regime in the early 1990s although the complicated racial and ethnic distinctions established under that regime have proven to be resilient. Archaeological human material has been the focus of a number of disputes that centred on claims by previously marginalized groups to heritage legitimacy. Collections gathered in the early-twentieth century as specimens for race science have since been reburied and various other assemblages have also been repatriated to descendant groups. Significant legislative changes accompanied the transition to democracy in the 1990s, and this has resulted in a focus on community involvement in heritage management, while proactive mentoring programs aim to draw students of African heritage into the discipline.

As with many other countries profiled in this volume, the development of physical anthropology in Turkey (Chap. 15) is inextricably linked to political ideologies and worldwide events that shaped academic traditions. In this particular context, human remains played an important role in the creation of the new nation-state after the collapse of the Ottoman Empire. Immediately after the foundation of the Republic of Turkey in 1923, the government commissioned systematic archaeological and physical anthropological research to aid in their agenda of the creation of a new and homogeneous Turkish state closely linked to a grandiose and deep past. The extensive study of crania by Turkish researchers was designed to prove racial homogeneity, but most importantly, racial equality with Europeans. As human remains were used as political tools for the ideological transformation of the new republic, the government initiated programs to invigorate physical anthropological research by sending students to prestigious universities in Europe and the USA. After World War II, racial studies in Europe and North America declined and Turkish political discourse changed to the development of cultural and ethnic nationalism. Still, typological studies continued to be carried out by Turkish researchers, but these were developed in isolation with little contact outside the country. Closer cooperation with the European Union revived academic traditions in Turkey in the 1980s and 1990s and resulted in the expansion of the university sector and of anthropology as a discipline. This transformation also resulted in greater interactions with the international academic community.

Since the 1970s, bioarchaeology in the USA has undergone a number of transformations (Chap. 16). Rakita offers a review of the academic and other events that have shaped the discipline in USA since its definition by Buikstra in 1977. During the first decade, bioarchaeological studies had a slow start and their incorporation into the anthropological mainstream was not immediate. He argues that much of the research published in this decade was essentially methodological in focus (e.g. palaeopathology; palaeodemography; bone chemistry). Rakita suggests that a major force in the development of the discipline was the publication of *Palaeopathology at the Origins of Agriculture* (Cohen and Armelagos 1984). This

was the first assessment of the biological consequences of the transition to agriculture in different geographical contexts, and it contradicted the prevailing progressivist understanding of the process. The publication had a significant impact in the broader discipline of anthropology and made an important contribution to establishing the credentials of bioarchaeological approaches. The passing of the NAGPRA legislation was another defining moment and led to a standardization of recordation. These events also contributed to a surge in research and publications. Rakita posits the emergence of a number of different schools of bioarchaeology, which he argues can be divided into two primary groupings or tribes. He labels these as the 'biological adaptation tribe' and the 'anthropological question tribe' and discusses the different orientations of these lineages. He also suggests that in its early decades, bioarchaeology in the USA was primarily an in-house affair but that has changed in recent years. This is a reflection of the dynamism of the discipline in other world areas as well as the adoption of the North American model of bioarchaeology in many countries. Rakita credits some leading US researchers for some of this external growth due to their work overseas and efforts to seed bioarchaeological research in other jurisdictions.

Scaramelli and Scaramelli present a familiar narrative from Venezuela (Chap. 17) of the colonial Othering of indigenous peoples and the collusion of scientists in this process. The exoticization of the local population by the colonial power was originally negative and pejorative. There was some change of attitudes in the early-nineteenth century when explorers found evidence of impressive archaeological remains though this also resulted in the familiar trope of regarding these not as the work of the ancestors of the modern indigenous population but rather the work of earlier, more intelligent races. Colonial era fantasies, such as the characterization of the pre-contact population as pygmies, continue to have sporadic recurrence at the level of the popular imagination. Although some Venezuelan anthropologists had engaged with different forms of local *indigenismo* movements, this did not address the disconnection and lack of ownership of the past among the population of European descent, contributing to the persistence of a near ignorance of the pre-Colombian past. A significant difference with most of its neighbours with the exception of Brazil is the early date for the teaching of physical anthropology in Venezuela, which began in the 1880s, with Virchow playing a role in this process. In recent decades, there has been a move away from craniometrics to genetics, forensics, and other concerns. This expansion of research agendas has occurred in a unique political setting, where the new constitution of 1998 has led to a fundamental reassessment of relationships within Venezuelan society. This has acknowledged the need for dialogue with descendant communities and the resulting political discussions regarding the ethics of archaeological work with human remains provide a model of such engagement that differs in nuance from those adopted in other world areas.

As many of these case studies highlight, institutions such as national museums and universities have played central roles in the development of research into archaeological human bone. In many of the cases documented here, these are state institutions where governments have an input, direct or indirect, in research

agendas. Many of the countries profiled here were governed by totalitarian regimes for at least some of the twentieth century. These have produced varying responses in terms of either stifling archaeological and anthropological inquiry or promoting insular, inward-looking research. In many cases, transitions to democracy have facilitated external contacts, two-way communication, and improved research and collaborative efforts.

The colonial experience is another common theme in the essays presented here. In almost all of the contexts profiled in this volume, the earliest studies of archaeological human remains were typological and rooted in European scientific traditions. Research agendas were primarily concerned with issues of race, origins, and migration, with craniometric studies providing the principal methodology. The study of archaeological human bone shares with anthropology in general a history tainted by this racial agenda (Stocking 1987). This was most marked in areas that were colonial subjects and in some countries, research aimed at bias correction still continues. Returning to the original focus of the Vancouver seminar mentioned at the outset, this volume illustrates that significant differences remain between practitioners in their approaches to archaeological human remains that the following essays suggest are due to the different countries' unique historical trajectories involving varying linguistic and cultural landscapes, and in many cases, encounters with European and North American colonialism. Yet, the foundational role played by European scientific traditions has created an environment in which human remains are understood as universal biological phenomena. While this perspective has been challenged, it has facilitated the type of movement of practitioners between countries that we mentioned above in our own experiences. This volume suggests that such movement of personnel should not just be based on a sound understanding of methodologies employed in the analysis of archaeological human bone but should also involve an understanding of praxis of the discipline in the specific jurisdiction and of its historical development.

The diversity in the terminology used in the papers in this volume—physical anthropology, biological anthropology, skeletal biology, osteology, bioarchaeology, human osteoarchaeology—also reflects the distinctive histories of research into archaeological human remains. To paraphrase Rakita's paper in this volume, there are many bioarchaeologies. One important change is the emergence in some regions of socially sensitive approaches and recognition of the potential value of skeletal studies for the living. Within the most established academic tradition, that in the USA, nuanced differences of approach have developed. A key element in this diversity is the interdisciplinary nature of the study of archaeological bone, its varied intellectual roots, and influences. This interdisciplinary nature is one of the strengths of the discipline and has provided it with a malleability that has allowed it to adapt to changing landscapes both in terms of theory and practice.

The history of racism and colonialism has continued to dog the discipline with recent critiques of bioarchaeology as racist (see Chap. 16). While these have been rebuffed, the perception of the discipline as reactionary survives in some quarters. This demands vigilance and engagement on the part of those working in the discipline. Sofaer has argued that 'practitioners need to be critically aware of the

way that their fields are defined historically and maintained socially and to understand the broader relationship between their practice and that of others if archaeology as a whole is to move forward' (Sofaer Derevenski 2001, p. 126). It is our hope that this volume contributes to fostering such awareness.

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Chapter 2
Bioarchaeological Research in Argentina: Past, Present and Future Challenges

María A. Bordach, Osvaldo J. Mendonça, Mario A. Arrieta and Lila Bernardi

Introduction

It is not possible to reach an understanding of the particular circumstances that have shaped the development of bioarchaeology in Argentina without taking into account the main historic, socio-cultural, ideological, and political conditions that have shaped the idiosyncratic development of the nation itself. A brief account of historical happenings that paralleled the development of bioarchaeology in Argentina is presented here.

By the time of the Iberians arrival in the New World, Spain was an absolute monarchy and had initiated the religious programs of the Counter Reformation and the Inquisition (Olin 1992). Through these monarchical and religious institutions, Spain succeeded in firmly imposing the religious zeal of Catholicism in Latin America, as well as establishing the commercial monopoly of the Metropolis over the newly incorporated territories. This era of Spanish colonial rule in Latin America would continue for nearly three centuries until the rise of regional liberation movements in the nineteenth century. This stage, which marked the end of the dominion of the Spanish kingdom over Argentinean territories, was subsequently succeeded by the beginning of yet another epoch of diplomatic, economic, ideological, and political dependency: that of the British Empire, whose influence

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would last until the first half of the twentieth century. This penultimate phase of dependence would be followed by yet another era of foreign control in Latin America, one which has lasted well into the twentieth century. That was the hegemonic diplomatic, ideological, and economic influence of the USA over the entire Latin America continent. This most recent chapter in a long history of dependences is well known as "America for the Americans", a statement known as "the Monroe Doctrine" (Perkins 1927).

It was within the context of these diverse influences that the consolidation of the Argentine nation state took place. These efforts were decisively influenced by the political ideology of what is known as the "Generation of the 1880s" (the presidencies of Bartolomé Mitre, Domingo F. Sarmiento, Nicolás Avellaneda, and Julio A. Roca, from 1862 to 1886) (Foster 1990). One of the socio-political results of this ideology was the opening of the borders of Argentina to a massive immigration of people. Most of these immigrants were drawn from Europe, which was considered to be pinnacle of the development of civilization. This migratory phenomenon was paralleled by a series of cruel military raids that in many cases escalated into true genocides of the native populations. This was particularly the case with those living in the Pampas whose fertile lands were coveted due to their richness and potential to foster the intense agricultural production and extensive cattle farming that would transform Argentina into "the granary of the world" (Lewis 1990).

It is in this way that the history of modern Argentina has developed. On the one hand, a narrative of Argentina's past has been founded upon the denial of the existence of its native peoples, who have been dismissively labelled as "barbarians" and "primitive"—categorizations that in actuality have been accompanied by a discriminatory disdain for their cultures, ethnic origins, population roots, and subsistence economies. On the other hand, the construction of the Argentine national narrative has been based on the idyllic notion of Europe as the apogee of civilization and thus a social model that newly emerging nations such as Argentina must aspire to copy, emulate, and achieve. As a result of this latter mindset, the doors of academic life in Argentina were open to everything coming from Europe or that seemed European-like, because it was considered the most advanced, the most modern, the most exceptional, and, as a result, the most desirable. In many cases, the concepts and constructs mimicked by intellectuals in Argentina were already obsolete in their centres of origin, such as occurred with ideologies founded upon racism, totalitarianism, and segregation, all of which were characterized by intolerance as well as a strong resistance to change in paradigms (Boschín and Llamazares 1984). As this paper will evince, these circumstances contributed to the constraining of the development of bioarchaeology in Argentina.

Historical Background (1850–1970)

Historically in Argentina, the study of peoples of the past was the main focus of research in Archaeology and prehistoric physical anthropology. Although generally these two disciplines seem to have walked hand in hand in the development of prehistoric research, this paper aims to demonstrate that due to theoretical as well as historical reasons, osteological studies were almost always subordinated to archaeological research (Carnese et al. 1991–1992; Cocilovo and Mendonça 1989). This asymmetrical disciplinary dependence resulted in a delay in the development of prehistoric physical anthropology when compared to Archaeology, since the latter benefited from an ever-increasing number of researchers as well as from the innovations in theory and professional practice.

Human skeletal remains from burial sites have been systematically studied in Argentina since the early 1900s. This early and long-lasting phase of study spanned from the turn of the twentieth century until the late 1970s and was largely characterized by typological and racial approaches to the characterization and categorization of human remains. Guided by the prevailing notion that archaeological research serves to gather collections from cultures either already extinguished or in process of vanishing, researchers rapidly and repeatedly filled the shelves of the main museums (i.e. Museo Bernardino Rivadavia, the Museo Etnográfico, and the Museo de La Plata) with bone collections of "dead cultures and peoples" (i.e. Casanova 1943; Debenedetti 1930; Marelli 1910; Paulotti and de Paulotti 1950). Although these researchers performed systematic excavations of the human remains, the associated archaeological contexts were either dismissed as unimportant to the bioarchaeological research or simply recovered and stored separately. Additionally, skulls were often added to collections in the absence of accompanying postcranial bones (Fig. 2.1). As a result, the early days of prehistoric physical anthropology in Argentina was a time in which academic agendas were dominated by descriptive and largely uncritical studies, and the osteological reports were limited to mere appendixes attached at the end of archaeological papers (i.e. Chávez de Azcona in Cigliano 1967, Fortich Baca in Madrazo 1966; Marcellino and Ringuelet 1973).

From an academic perspective, cultural as well as osteological remains from native peoples were considered "objects" that were worthy of collection. At the same time, the indigenous were simplistically and reductively grouped into a single, undifferentiated social category and were considered to be "peoples without history". Among the cultural and political reasons for this trend was the intellectual worldview inherited from the Spanish conquest, which viewed the defeated native peoples as well as their cultures with a Eurocentric attitude of disdain (Olin 1992). This academic intellectual arrogance prevailed, leading to the disregard or outright denial of the importance of the indigenous Pre-Columbian past as a tool for the construction and consolidation of national identities and in defining the historic patrimony of the nation (Fig. 2.2) (González 1985).

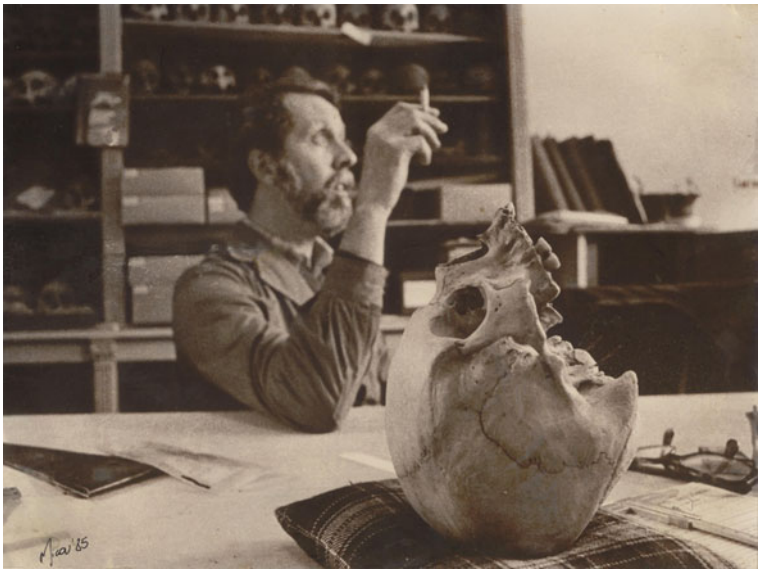

Fig. 2.1 Shelves filled with skull collections (Museo Etnográfico, Buenos Aires, Argentina)

The racial and typological approach to osteological studies predominated in Argentina from 1850 until 1970 and was characterized by morphological as well as metrical analyses of mostly craniological collections, the main goal being the study of racial diversity (Chillida 1943; Dillenius 1913; Scolni de Klimann 1938). The academic trend was influenced by the arrival in Argentina of representatives ideologically identified with "School of Vienna or Möedling" (Boschín and Llamazares 1984; González 1985; Madrazo 1985). This influx of foreign academic conceptual frameworks was augmented with the migration of many scholars from different European countries such as Germany, Austria, and Italy to Argentina soon after the end of World War II (Boschín and Llamazares 1984, González 1985; Madrazo 1985). As a whole, these foreign researchers were not only warmly welcomed, cared for, and protected by the Argentine government, but were also offered important academic positions in the main institutions of the country. Additionally, they enjoyed the sympathy of the then government in Argentina that was openly demonstrated towards the ideologies sustained by the defeated totalitarian regimes in Europe (González 1985; Madrazo 1985).

As a result of the constant inundation of intellectuals from an array of European countries and their significant influence in research institutions, typological as well as racial approaches to bioarchaeology continued to prevail in the academic life of Argentina during decades in the period between the close of nineteenth century and the second half of the twentieth century (cf. Carnese and Pucciarelli 2007). Furthermore, after World War II, the important theoretical and methodological developments that took place in countries such as England, France, and the USA or even in those countries from the Western Hemisphere (i.e. Peru, Mexico, and

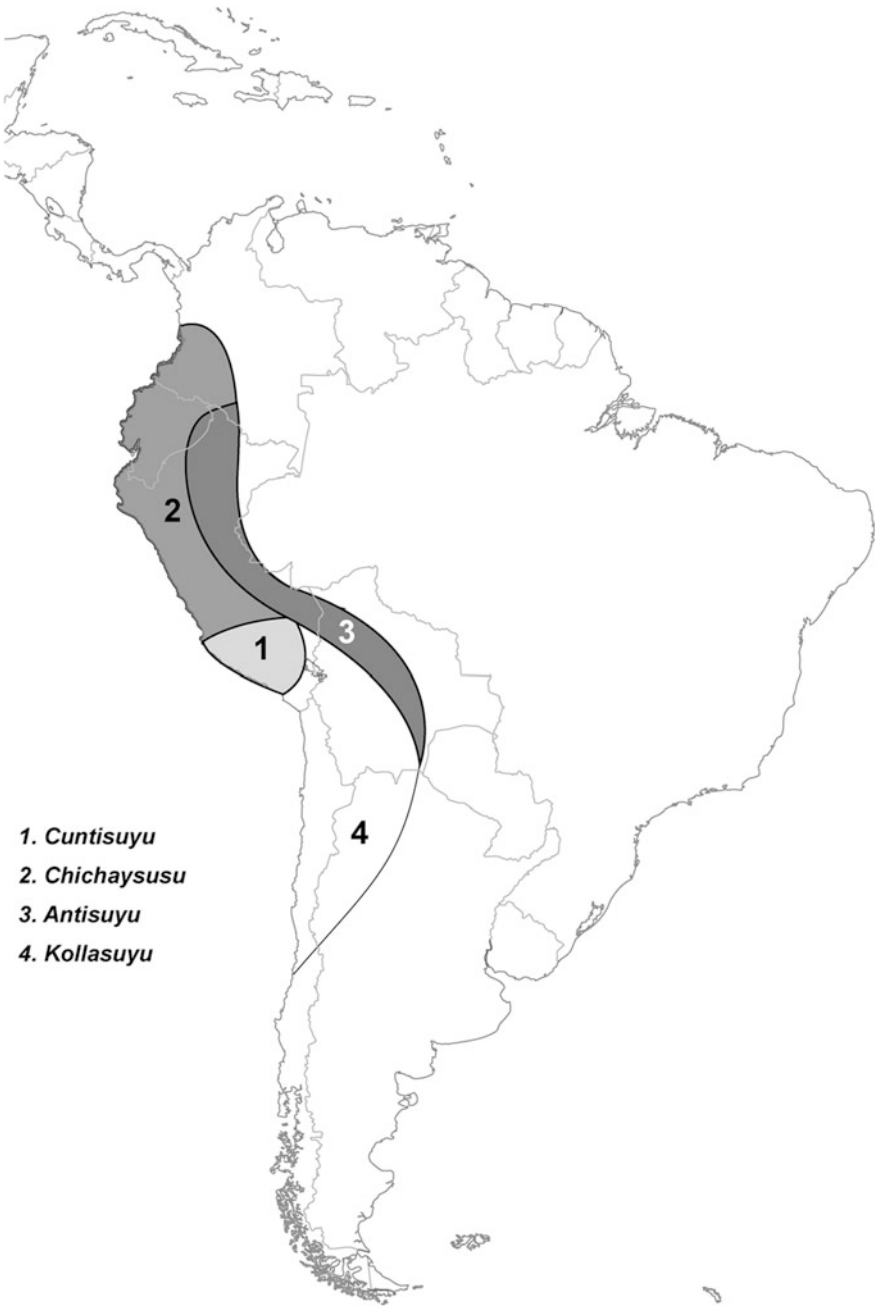

Fig. 2.2 Area covered by the Inka empire at the time of the conquest. As shown, the ultimate expansion of the Tawantinsuyu to the south (Kollasuyu) incorporated significant Argentinean territory

Chile) were not reflected in Argentinean academic discourse. Instead, academia in Argentina remained stagnant, with theoretical discussions continuing the aim of sustaining outmoded conceptualizations of race and the prehistoric peopling of the Americas (Stewart 1944, 1960). The reluctance to liberate physical anthropology from the antiquated principles associated with racial and typological approaches continued to persevere in spite of the pioneering efforts of scholars at the Museo de La Plata such as Alberto Rex González (González 1985), who postulated the need for introducing up-to-date modifications in the theory and practice of prehistoric physical anthropology. Perhaps the most important and influential academic figure in Argentine physical anthropology, as well as one of the most significant causes of its hindered development, was José Imbelloni, an Italian scholar with strong ties to the School of Vienna and the racialized, creationistic narratives of diffusion and typological differentiations endorsed by Frassetto (1918) and Sergi (1930).

For decades, the vigorous personality of Imbelloni succeeded in dictating the academic agendas in Argentina and was considered as one of the most prominent and iconic figures of the physical anthropology in the country. While his studies included the anthropometric recording of native populations, most of his research was purely descriptive and with an emphasis on craniology. Imbelloni's approach to the past was firmly grounded in concepts of biological and cultural diffusion and in a political ideology with a strong conservative basis. He became a powerful voice sustaining the idea that behind the veneer of morphological homogeneity, a great variety of forms and racial types was hidden and that it was this racial diversity that characterized native populations in the Americas. In this way, "pure" racial types were proposed to explain morphologic differences observed between different native peoples of the Americas (Imbelloni 1938). Those "pure" racial types were subsequently attributed to different population waves in which, according to Imbelloni, constituted the initial peopling of the Americas (ibid). Furthermore, in order to explain those morphologies that did not match exactly his idea of "pure", morphologic racial types, Imbelloni proposed the concept of "metamorphic types". This was his way of explaining the heterogeneity he observed which he interpreted as "hybridizations" between the different "pure" racial types that populated the Americas across the Bering Strait during successive waves of migration. In this way, Imbelloni's decades-long dominance drove osteological research in Argentina towards a true academic dead end and hampered the work of scholars as well as the arrival of new theories and academic practices. Although a series of papers published in the USA by T.D. Stewart (1944, 1960) criticized Imbelloni's approach, those publications and the ideas expressed in them were largely ignored at the time. Instead, the creationist-like theories and conservative ideas of Imbelloni endured in Argentinean academia until the 1970s (Boschín and Llamazares 1984).

Yet another obstacle to the development of physical anthropology in Argentina was the absence of comprehensive and continuous excavation of human remains in archaeological research projects. For decades, most physical anthropologists performed very little, if any, fieldwork to excavate skeletal remains (e.g. Chávez de Azcona in Cigliano 1967, Fortich Baca in Madrazo 1966; Imbelloni 1938;

Lehmann-Nitsche 1898, 1907, 1908; Marcellino 1981; Méndez and Salceda 1989, 2009). Instead, they were purely laboratory-based. The resulting reports would give a general analysis of race, pathology, stature, and, at best, some basic demographic data, although often using old-fashioned standards (Barboza et al. 2002, 2004). If the researcher was unable to reach a clear racial diagnosis, at least some morphological clues denoting the presence of more than one racial trait in the skulls were provided. This model for academic research was unquestioningly and unreflectively replicated in research projects throughout the greater part of the twentieth century. Imbelloni's typological and racial approach was finally abandoned in the 1970s and replaced by the biological concept of population (Mayr 1970).

Among the reasons for ideological resistance to academic change was the political and ideological intolerance that characterized the years of military dictatorship in Argentina (1955–1983). This period was characterized by a greater darkness than that presented by academic neglect, as the restrictive political–military regimes compelled many promising scholars to leave the country for fear of being suspected of subversive activities. All of these circumstances intertwined to generate an insurmountable obstacle for the academic innovation in a country that was already strongly marked by ideological colonialism, intellectual dependence, violent repressions, and theoretical paralyses (Madrazo 1985). Although the first census of native populations was undertaken by the Argentinean government in 1966, this did not augur greater inclusivity nor did it result in the improvement of socio-cultural conditions of these peoples, nor the traditional approaches to the indigenous in academic agendas.

While physical anthropology stagnated under Imbelloni's influence, some changes occurred in archaeological theory and practice. This was thanks to the leadership of Alberto Rex González, who has since become considered the father of modern archaeology in Argentina. From the 1950s on, the concepts of diachrony as observed in stratigraphies and in absolute radiocarbon dating were incorporated into Argentine archaeology, along with the chronological framework of archaeological sequences characterized by cultural influences, cultural changes, and cultural replacements (Fig. 2.3).

It was ultimately with the arrival of Processualism in the 1970s that the approaches and schemes of diffusion and typology were definitively abandoned in Argentina. Coinciding with the advent of democracy, many young scholars started to introduce innovative theories and methodologies into their research projects, once and for all, leaving behind the obsolete paradigms previously described. Later, some scholars embraced the postulates of Post-Processualism. Ever since the early 1970s, the contributions of modern biological dynamics and evolutionary synthetic theory influenced academic arenas in Argentina (Dobzhansky 1962; Mayr 1970, 1976, 1982; Simpson 1967; Thienemann 1956). Additionally, statistical approaches have gained credence in academic agendas, when some researchers focused on skull assemblages from museum collections (Cocilovo 1981; Cocilovo et al. 1982, 1987–1988, 1994; Marcellino 1981; Marcellino and

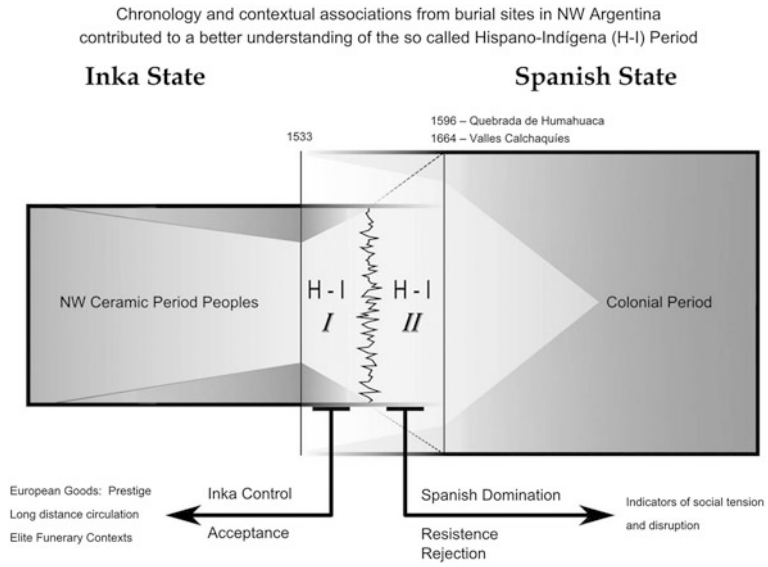

Fig. 2.3 The initial phase of Imperial Inka influence in NW Argentina took place sometime in the first half of fifteenth century. The fall of Cuzco in 1533 and the end of the resistance of native peoples to Spanish penetration in 1664 set a period of cultural overlapping, in which the understanding of the extent and meaning of the so-called Hispano-Indígena (H-I) Period (*crooked line*) ought to be regionally approached. According to our findings, it is the Inkas, not the Spanish influence what is shown in H-I I funerary assemblages (after Mendonça et al. 2013:69)

Colantonio 1993a, b; Méndez et al. 1984, 1997a, b; Rothhammer and Silva 1989, among others). Several papers written by Argentinean scholars were published in prestigious, peer-reviewed, international journals, thus contributing to a more complete understanding of past peoples in the Americas.

As seen, the history of the development of theory and professional practice in the academic discipline of osteological research in Argentina has always been paralleled by a series of ideological, political, economic, and cultural associations. The denial of native peoples and the primacy of European ideologies in the formation of skeletal and archaeological collections were two important inhibitors to the inclusion and integration of the diverse groups of people who form the Argentine population. With the surmounting of these obstacles, a regrettable chapter of Argentine history has been closed.

Current Status of Bioarchaeological Research in Argentina

The idea that bones with cultural associations from archaeological sites ought to be seen and studied as the living organisms they once were was first introduced in Argentina in the early 1980s by Jane E. Buikstra, who studied the human remains

from the abandoned old city of *Cayastá* or *Santa Fe La Vieja*, offered several lectures at Santa Fe city, and provided bioarchaeological reports released to the Provincial Government. In the late 1980s, Walter Neves, a Brazilian bioarchaeologist, offered a graduate course on "Functional Anatomy and Life Style Reconstruction" at the Museo Etnográfico in Buenos Aires. These two events introduced the praxis of bioarchaeology in Argentina and opened the doors to a new era in the study of human remains in the country.

These academic trends prompted a realization that research teams ought to integrate and interact with physical anthropologists trained in bioarchaeological research (Aguerre 1996; Berón and Luna 2007; Borrero et al. 2000, 2001a, b, c, 2003a, b; Politis and Barrientos 1999; Tarragó et al. 1997, 2004, among others). The idea that both archaeologists and physical anthropologists should work hand in hand, getting equally involved in the systematic excavation of human remains and sharing common research goals, eventually predominated in the practice of bioarchaeological research in Argentina and continues to inform the organization of research projects today.

Slowly yet steadily, an increasing number of scholars have become actively involved in the excavation and systematic recovery of funerary contexts (Barrientos 2001, 2002; Barrientos and L.'Heureux 2001; Barrientos et al. 1999; Martínez and Torres 2000; Martínez et al. 2004, 2006, 2007; Politis 2000, 2001, 2002, among others). Young Argentine scholars interested in archaeological research have started to become acquainted with biological concepts and their potential applications in bioarchaeological issues (Barrientos et al. 1999; Berón and Luna 2007; Berón and Politis 1997; Martínez 1999; Luna 1996; Mendonça et al. 1993; Novellino et al. 2003, 2004; Scabuzzo and González 2007, among others). Bones are without doubt an integral part of the archaeological record. As such, they have to be excavated, recorded, analysed, interpreted, and preserved in order to utilize fully their immense potential to increase our understanding of peoples of the past. These endeavours have become the foundation of modern osteological research in Argentina regarding peoples of the past, which is, as elsewhere, termed bioarchaeology (i.e. the discipline that places emphasis on the biological component of the archaeological record) (Buikstra 1977; Larsen 1997, 2002, 2006).

Finally, it is important to mention the work and contributions performed by the Argentinean Team of Forensic Anthropology, led by the American anthropologist Dr. Clyde Snow, for their role in the identification of more than five hundred individuals murdered during the years of military dictatorships (1970–1982) in Argentina. The outstanding work done by members of the forensic team is well known not only in Argentina but also worldwide.

The current generation of Argentine scholars is committed to the systematic recovery of bones and their associated cultural materials. As a consequence, various sponsoring institutions (most notably the Universidad Nacional de La Plata, the Universidad de Buenos Aires, the Universidad Nacional de Río Cuarto, the Universidad Nacional del Centro de la Provincia de Buenos Aires, and the CONICET, among several others) have made significant changes in the practices

and protocols for the conservation, preservation, and storage of osteological materials and associated contexts. Due to these systematic transformations in academic, theoretical, and methodological approaches to the study and treatment of human remains, bioarchaeology in Argentina is now considered to be an emerging discipline that has a great potential to contribute to the integrative anthropological understanding of the peoples of the past.

Future of Bioarchaeological Studies in Argentina

In the last few decades, an increasing number of researchers in Argentina have become involved in academic exchanges with North American and European scholars interested in bioarchaeological affairs (e.g. Douglas Ubelaker, Jane Buikstra, and Ana Luisa Santos, to mention a few). Linkages with laboratories that specialize in dating methods and chemical analyses of bones and teeth have also been important to the work of Argentine bioarchaeologists. Equally relevant to the continued development of bioarchaeological research in Argentina has been the passage of new legislation regarding the indigenous communities in the country (Leyes Nacionales 25.743 y 25.519). The government has finally recognized the historically denied rights of the numerous native communities living in the country. As a consequence, a long-anticipated, socio-cultural, political, and economic transformation is taking place in Argentine society. The implications in the academic and cultural spheres are still in the process of unfolding. One of the main results of this legislation is that it protects the archaeological record and clearly establishes the academic need for respect and consideration for the ancestors of native peoples as well as their descendants, i.e. present-day Quechua speakers (NW Argentina); Guaraní speakers, Tobas; Pilagás (NE Argentina); Patagones (Southern Argentina); Pampas; Ranqueles; and Mapuches (Central Argentina), among many others. Native communities in Argentina are shedding the bonds of centuries of European, colonial, and modern state domination and are making claims for their ancestral lands as well as for the skeletal remains of their ancestors. This is a major issue for anthropologists in Argentina today. Political, ideological, socio-cultural, and historical issues are being aired in national discussions, while also being seriously considered in academia.

In spite of many efforts, thus far, no organized institutional or corporate response to these claims has been settled. However, it is our conviction that the human as well as constitutional rights of native peoples to equality and respect should not become an obstacle to the human and constitutional rights of scholars to do their academic duty and to do it well. In several meetings held at Santa Rosa in La Pampa Province and elsewhere in the country, we had the opportunity to observe all that can be gained from a fruitful interaction and sincere exchange of opinions, ideas, and information. In such discourses, representatives of native communities were invited to express their thoughts and ideas. They demonstrated a respectful understanding of the fact that anthropologists should not be seen or

perceived as the visible faces of centuries of European as well as national domination and genocide. Furthermore, they proved to have a clear and consistent knowledge regarding the work of bioarchaeologists as well as the importance and enormous heuristic value of the skeletal remains of their ancestors in the improvement of our knowledge of the past of native peoples living in Argentina today. The future of bioarchaeological research in Argentina is thus more than promising from our point of view.

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Chapter 3
Becoming Bioarchaeology? Traditions of Physical Anthropology and Archeology in Armenia

Maureen E. Marshall

Introduction

"Bioarchaeology" has recently made its way into publications and presentations on the physical anthropology and archeology of Armenia. Like other regions discussed in this book, bioarchaeology has been heralded as a new and important approach to analyze skeletal remains that moves away from typology toward historical reconstruction of human behavior. Yet, the questions asked, discussions, and presentation of skeletal analysis look quite different from Western—and particularly American—bioarchaeology. In this chapter, I suggest that this difference is rooted in a distinct historical trajectory in physical anthropology that has been shaped by three forces: (1) late-nineteenth-century European anthropology; (2) the Soviet approach to ethnogenesis; and (3) tensions and concerns over Armenian identity and history. While distinct in many ways, these influences have maintained a focus on *origins*, and in doing so have generated a conception of archeological and skeletal populations that is distinct from the Western understanding of relationships between past peoples in space and time.

Origins of Physical Anthropology in Armenia

Similar to many countries, the origins of physical anthropology in Armenia reside with late-nineteenth-century Western European practices of investigating human variation through racial classifications that drew on cranial measurements. As a region teeming with different languages and peoples, the Caucasus held special interest to scholars debating the origins and migration routes of Indo-Europeans, leading European anthropologists to launch investigations of the languages,

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cultures, physical characteristics of the contemporary populations, and the ancient past of the Caucasus region. One of the first European researcher to work in the area was Friedrich (Frédéric) Bayern (1816–?), an amateur scholar from Cronstadt who moved to the Caucasus in 1850 and traveled throughout the region collecting a wide range of materials (from entomology samples to archeological objects). Bayern participated in the excavation of Bronze–Iron Age cemeteries in three regions of the Caucasus, including Redkin-Lager located near Dilijan in modern day Armenia, Samtavro near Mtskheta in Georgia, and Stepan-Zminda and Koban in Ossetia (Bayern 1882). The objects and skeletal remains from these excavations attracted the interest of French anthropologist Ernest Chantre (1843–1924) from the Muséum d'Histoire Naturelle de Lyon and German pathologist, anthropologist, and statesman Rudolf Virchow (1821–1902). Bayern, Chantre, and Virchow all agreed that the crania from the Redkin-Lager tombs were dolichocephalic,[1] yet they created very different interpretations of the connections between these people and Indo-Europeans.[2] Bayern dated Stepan-Zminda and Koban to the Iron Age, while he placed the Redkin-Lager and Samtavro tombs slightly earlier at the Bronze–Iron Age transition, broadly correlating them to the Bronze–Iron transition in Europe.[3] Chantre argued that Redkin-Lager, Samtavro, and Koban should all be dated to a single Iron Age "civilization," which developed in Asia and then diffused into Europe, in part because the craniology seemed to support a unified civilization through a common dolichocephalic type (see Chantre 1882, 1886). Virchow disagreed, arguing that while the crania were "Aryan" and did seem to be connected to the prehistoric populations of Europe, these populations seemed to have undergone a separate "cultural-historical" development (see Virchow 1883).

In contrast to the Bronze and Iron Age dolichocephalic crania, Chantre (1895) found that modern Armenians had brachycephalic crania. In fact, Armenian crania were so distinctly brachycephalic that in 1892 Felix Ritter von Luschan (1854–1924) coined the term "Armenoid" to describe crania with a flat plan-occipital, extreme brachycephaly, and a narrow high nose (von Luschan 1911: 240). von Luschan argued that the Armenoid type was the "original" common ancestor of populations inhabiting south-west Asia and could be linked the Hittites

[1] Dolicocephalic refers to cephalic index (the ratio of a head's length to breadth described as a percentage) of <75 % or "long headed," while brachycephalic refers to ≥80 % or "round headed" (see Reitzius 1846). Here, I have used the terms cephalic index and dolicocephalic for brevity, but it should be noted that dolichocephalic and brachy cephalic refer to the morphology of the heads of living subjects, while the terms dolichocranic and brachycranic are specific to the (skeletal) cranium.

[2] Just a few years later in 1887–1889, Jacques Jean Marie de Morgan (1857–1824) was put in charge of overseeing a copper mine at Akhtala in Armenia and excavated 898 Iron Age burials that were nearby Lindsay and Smith (2006: 168), Morgan (1889: 82). Morgan's 1889 publication focused on the material objects and in particular metallurgy, but he also included sketches of couple of crania and concluded that they were dolichocephalic.

[3] Bayern also introduced the Brathonic term "cromlech" to describe the tombs in Armenia.

(1600–1178 BC).[4] In contrast, Chantre connected the Armenian crania to ancient Urartians depicted in Assyrian bas-reliefs (Chantre 1897: 101). While there were few additional studies of archeological crania prior to World War I, anthropometric studies of modern Armenians continued to proliferate and to routinely link modern and past populations, associating them with a "pre-Aryan Alpine stock," (Childe 1926), with Hurrians (Kappers 1934), and with Phrygians (Kherumian 1943). In these ways, nineteenth-century European physical anthropology and archeology connected modern Armenians to ancient ancestors, whether Hittite, Hurrian, or Phrygian, and drew their origins to Indo-Europeans and the Near East.

Soviet Ethnogenesis

While ultimately the Soviet Union dramatically reconfigured the direction of research and the practice of physical anthropology, in the first years following the revolution, the pre-war tradition of cranial typological analysis was retained and continued, mainly under the direction of Bunak (1891–1979), a student of Anuchin (1843–1923). During the war (1913–1917), Bunak had followed the advancing front of the Russian Empire into "Turkish Armenia" and collected crania from modern Armenian populations, bringing them back to Moscow State University (MGU) for analysis and curation (Bunak 1927: 8). Bunak's craniomentric analysis, published in *Crania Armenica* (1927), was very much in line with the old European physical anthropology; however, he firmly rejected the notion of the Armenoid type on the grounds that types should be based on geography and history. "Failure to take into account the significance of the territorial factor is a sin of antihistoricity. Therefore, even for denoting races the only terms that are appropriate, are geographical, not morphological or ethnic ones," (Bunak 1961: 38). He thus chose "Ponto-Zagros" as a geography-based nomenclature to describe Armenian crania and attributed to them a Near Eastern origin (Bunak 1927: 47, 96). Two years later, he followed up with an analysis of 40 Bronze and Iron Age crania excavated by Yervan Lalayan (1931) in the Sevan Basin region. Bunak measured 33 morphological indices and recorded 15 descriptive features (see Tables C–D and B in Bunak 1929: 84–87) and like Chantre before him, he concluded that these archeological crania were distinct from modern Armenians and characterized by "their pentagonoid-ovoid shape, dolichocranic, chame-orto-cranic, leptoprosopic, leptorhinic and mesoconchic indices," (Bunak 1929). Bunak identified these morphological traits as European, and specifically North-European. His interpretation was critiqued by Georgiy Frantsevich Debets (Debetz) (1905–1969), who challenged the "North-European" classification mainly on the basis of the North-European

[4] Jacques Jean Marie de Morgan (1857–1824) also made a connection to the Hittites; he compared two crania from his excavations of 898 Iron Age tombs near Alaverdi, Armenia with reliefs of Hittites and suggested that they shared common morphological features (Morgan 1889).

comparative materials and instead asserted that the characteristics Bunak noted in the Sevan Basin crania were "proto-morphic" or proto-European (Debets 1948). Thus, while working within the familiar realm of cranial racial types, both Bunak and Debets' focus on history and geography cleared the way for studies of autochthonous development that was the cornerstone of the Soviet ethnogenesis approach.

In the second half of the twentieth century, ethnogenesis became the dominant theoretical (or ideological) paradigm in Soviet social science. After the long-"clash between science and power" throughout the 1930s and 1940s (Godina et al. 1993; see also Pollock (2006), genetics was officially condemned as a "bourgeosie" science in 1948 and 2 years later, Stalin published his famous critique of Marr's Japhetic linguistic theory in *Pravda*, effectively ending "internationalist" and historical-materialist interpretations in favor of the historical development of ethnos (Shlapentokh 2010; see also Yurchak 2003). Stalin's critique set the various branches of Soviet social sciences to reformulating the position of their fields, typically rejecting Marrism in favor of ethnogenesis. In physical anthropology, leading anthropologists Debets et al. (1952) responded with a rejection of Marr and advocated an approach based on the historical process of ethnogenesis in which physical types, language, and culture were not synonymous. As they reminded readers by quoting Stalin's famous line from *Marxism and the National Question* (1913), "a nation is not a racial or tribal, but a historically constituted community of people." Indeed, many early "practitioners" of the ethnogenesis approach seemed to have simply replaced "nation" with "ethnos" in Stalin's definition, "A nation is a historically constituted, stable community of people, formed on the basis of a common language, territory, economic life, and psychological makeup manifested in a common culture." Thus, Debets, Levin, and Trifomova suggested that—as a historical source—physical anthropological materials could contribute to the theoretical development of the relation of physical types with linguistic, cultural, and ethnic communities.

This basic framework held for Valerii Pavlovich Alekseev (1929–1991), who saw ethnogenesis as a historical process, but also one that was social, geographical, linguistic, psychological, and (in his later work) environmental and genetic. In the 1960s, Alekseev made several trips to Armenia, consulting with local archeologists and studying human remains from recent excavations. To the cranial series discussed by Bunak and Debets, he was able to add materials from Tsamakaberd and Shorigol on the shores of Lake Sevan (Alekseev 1968: 200). Alekseev concluded that there were two distinct cranial types present in Late Bronze Age/Early Iron Age tombs. One, the narrow-faced Indo-European type (dolichocephalic) was common in the tombs excavated by Lalayan on the eastern side of the southern shore of Lake Sevan. Dolichocephalic crania were also identified at the Neolithic site of Dzhrarat,[5] thus providing a "genetic" link

[5] Alekseev and Mkrtchyan (1989) later pushed back the date of the crania from Dzhrarat so that they were later than the Early Bronze Age.

between the inhabitants of Armenia in the Neolithic and the Iron Age. In contrast, crania from Tsamakaberd and Noraduz on the western side of Lake Sevan were identified as a broad-faced Indo-European or round head (brachycephalic) type. Comparing contemporaneous collections from Eurasia, Alekseev suggested that the second type indicated migrations (whether from the north or the south) into the region (Alekseev 1968: 201–203). Thus, the Late Bronze and Iron I periods saw both a continuation of a local population as well as some migrants. The intermixture of these two types figured into the ethnogenetic process that continued into the Middle Ages in Armenia.

In the 1960s and 1970s, Alekseev used the data from Armenia in widening and increasingly statistical analyses of morphological and metric variation throughout Eurasia (see Alekseev and Gokhman 1984: 143–144, 162). These analyses relied on his standardized method of recording and publishing age, sex, and measurements (see Alekseev and Debets 1964; Alekseev 1966), which facilitated comparison between skeletal populations. For each of these collections, average and individual measurements were listed in tables. Indeed, it was standard practice in publications to report raw measurement data (often listed by site and burial number), averages, and indices by Martin number (after Martin 1928), which were listed in tables. These practices meant that any physical anthropologist could draw on the data and compare it to any other cranial or skeletal series published within the USSR. Moreover, all people—ancient and modern—were represented in the same way and as a kind of "whole" population, yet they could easily be differentiated by ethnic group and time period.

Soviet ethnogenesis' unique combination of typology, historical process, and differentiation is exemplified in the work of Georgian physical anthropologist Malkhaz Grigorevich Abdushelishvili (1926–1998). Abdushelishvili (1954) first conducted new examinations of the human skeletal remains from Samtavro and then expanded his research to include both archeological and modern comparisons from the Caucasus. Based on crania from Samtavro in Georgia, Mingechauer in Azerbaijan, and Noraduz and Dzhararat in Armenia, Abdushelishvili argued that there was "genetic" continuity in the region from the Early Bronze Age through the Iron Age, and even into the Later Middle Ages. For Abdushelishvili, there was no migration of Indo-European brachycephals, rather the appearance of brachycephalic crania was due to a historical process of *brachycephalization*. The ancient inhabitants (long heads and narrow faces, or dolichocephalic) of the South Caucasus were connected with Mediterranean type of the European race, but over time, contact with other groups, or "social, cultural, economic and geographic conditions" resulted in "local" modification as the "ancestral type gave birth to the various modern types now living in the Caucasus" (Abdushelishvili 1968, see also 1979). Comparing craniometric averages from Armenia to individual data from the Bronze Age in Georgia and the North Caucasus, Abdushelishvili argued that there are distinct characteristics between the populations.

Thus, Abdushelishvili's approach allowed for differentiation between ethnic groups in the Caucasus, but maintained that the populations shared a common origin. The research question then became to look for the points in time when they

differentiated. This approach is similar to American ethnogenesis' focus on the process of becoming, but there is a particular emphasis on origins. Shnirelman (1996) refers to Soviet enthnogenesis as "primordialist" in comparison with the Western constructivist view point. At the extreme, ethnogenesis can be reduced to the study (and search for in the past) of the acquisition of cultural traits that are present in a modern population. Once these traits have been acquired, they become part of a people's culture and part of the historical legacy, which is carried into the future.

New Directions?

With the dissolution of the Soviet Union in the 1990s, several Russian scholars made a conscientious shift away from ethnogenesis and metric analysis toward new avenues of research. Most notably, Alekseev set out the human-ecology or paleoenvironmental approach and encouraged his students to investigate human-environment adaptation, specifically concerned with paleopathology, diet, and other sociocultural practices (see Alekseev 1993; Buzhilova 1995, 1998; Dobrovol'skaya 2005; Mednikova 2001). This approach has since developed into Russian bioarchaeology. In many of the former republics, however, ethnogenesis and metric analyses have continued to reign supreme and have even been incorporated to national projects.

In Armenia, both archeological and physical anthropology researches were initially slowed down by the devastating 1988 earthquake, the collapse of the U.S.S.R., and the socioeconomic situation that resulted from these events. Nevertheless, research continued and in the years since, international collaboration on archeological projects has helped to reach a widening audience (see Lindsay and Smith 2006). Physical anthropology in Armenia, however, has remained a limited field with only a few individuals analyzing human remains. Many continue to practice of investigating ethnogenesis through the analysis of metric traits (Khudaverdyan 2006, 2008; Palikyan 2008), although three new directions of research have emerged, namely analysis of non-metric traits, demography, and paleopathology.

For the most part, analysis of non-metric traits has been incorporated into the tradition of ethnogenesis. For example, Kozintsev (1988) compared non-metric traits from 65 populations throughout Eurasia, including Bunak's collection from Bingöl-Dağ. Subsequently, Movsesian (2005) and Movsesian and Kochar (2004) used phylogenic tree and factor analyses to analyze non-metric traits from Bunak's collection, Alekseev's Sevan Basin materials, and materials from several newer excavations that again spanned the Early Bronze to the Iron Ages. Movsesian concluded that there was "genetic integrity" (continuity) of modern and ancient Armenian populations from the Bronze Age, despite inter-population ties between the Sevan Basin and other areas of Armenia during the Bronze Age and further variation in the Antique period (or Iron III and Iron IV) (Movsesian 2005: 209). While Movsesian and Kochar made an effort to move away from morphological typological analysis, drawing on bio-distance measures based on the work of

geneticist Cavalli-Sforza, their conclusion mirrored the same concerns as Alekseev's ethnogenesis analysis, thus continuing the same focus on the ethnic identity and development of the Armenian population. In this case, "genetic" may have more of the meaning of "genesis."

A second direction has been taken by Alekseev's student, Ruzan Mkrtchyan, who has developed a demographic approach. Mkrtchyan's (2001) publication on the skeletal materials from the Late Bronze and Iron I site of Horom incorporated both an ethnogenetic comparison and a demographic analysis.[6] The enthnogenetic investigation included comparative analysis of crania from 25 sites in the Caucasus and Near East (n = 310), dating from the Early Bronze Age to the Iron Age and principal component analysis according to 17 indices. Mkrtchyan concluded that the crania at Horom paralleled the Late Bronze and Iron I moderation of the "extreme hypermorfness" [7] found in crania from Eastern Armenia in the Early and Middle Bronze Age. Such analyses continue in the tradition of Soviet ethnogenesis, but also contextualize the materials by comparing them with other contemporaneous *archeological* collections and sites.

Mkrtchyan also included in the Horom publication a demographic analysis of age-at-death and concluded that the Late Bronze and Iron I periods were characterized by a longevity of males and a high mortality of females in the early childbirth ages. She suggested that this pattern was conditioned by a privileged position of elderly males in Late Bronze–Iron I society (Mkrtchyan 2001: 50).[8] This demographic analysis moves toward a social and cultural analysis of past populations, situating them within their own sociopolitical context.

The third direction in human remains analysis has been in paleopathology (see Khudaverdyan 2005, 2010). Such analyses have great potential to add to the understanding of the practices and experiences of ancient subjects; however, the earliest attempts had yet to be firmly grounded in a rigorous methodological and interpretive framework, sometimes containing problems with diagnoses (see Mkrtchyan and Buzhilova 2006). Nor have pathological observations been situated within broader histories or epidemiology of particular diseases. Paleopathology is certainly challenging to conduct with limited resources and training; however, I suggest that the limited development of paleopathological interpretations is in part due to the legacy of ethnogenesis and typological analysis.

In 2010, Anahit Khudaverdyan published a paleopathological analysis in two English-language journals. Khudaverdyan (2010) dealt specifically with cranial trauma, dental pathology, degenerative join disease, and cranial modification from

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[6] Mkrtchyan recorded the sex and age for 143 individuals, long bone measurements for 55 individuals (40 male, 15 female), and cranium measurements for 37 individuals (20 male and 17 female).

[7] In Russian гиперморфность. The translation and spelling here are from the translated summary (Mkrtchyan 2001: 58). The author may be referring to a hypermorphic morphology or extreme growth and specialization.

[8] Mkrtchyan continued this socio-demographic analysis of Late Bronze and Iron I populations at Nerkin Getashen (2004) and Lchashen in the Sevan Basin.

two sites, Vardbakh and Sev Amrots from the Iron IV period (100 B.C.–300 A.D.), regionally known as Artaxiad and Arsacid. Khudaverdyan also included a detailed methods section that situated her work within the American bioarchaeology tradition. The results highlighted the occurrence of paleopathological conditions, but the analysis mainly revolved around observation and frequency. For example, in the case of degenerative joint disease, the general observation of "OA" was reported but not contextualized across sites according to age, sex, joint location, degree of expression, etc. This emphasis on the presence or appearance parallels the emphasis on traits in the ethnogenesis approach. I thus suggest that underlying this presentation of skeletal data is an understanding of population that is more ethnogenetic than an American bioarcheological genetic population. The significance of these observations lays less in understanding Artaxiad and Arsacid behaviors and activities, but in gaining knowledge about Armenian ancestors.

These three directions in research demonstrate a growing interest in American and Russian bioarchaeology and have opened roads for international collaboration. In 2008–2009, Mkrtchyan and the author inventoried the human skeletal remains at the Historico-Archeological Museum-Reserve "Erebuni" (Erebuni Museum) («*Erebuni*» *Patmahnagitakan Argelots-Tangaran*) and several collections housed at the History Museum of Armenia in Yerevan. Collections at Erebuni Museum included several of the cranial collections discussed above (Nerkin Getashen, Noraduz, etc.) as well as recently excavated materials from Kanagegh, Dari Glukh, and Hatsarat, while the History Museum of Armenia materials included remains from Artik and Horom.[9] Many of these collections were limited to crania or incomplete individuals, a result of both Bronze Age burial practices and the Soviet emphasis on metric analysis of crania and long bones. It is only within the last few years that the complete skeletal remains have been collected and preserved. Our collaborative work thus highlighted the diverse and rich potential of bioarcheological investigations in Armenia to shed light on social practices and lived experiences, but it also made clear the amount of work that must be completed before such potentials can be realized (see Mkrtchyan and Marshall 2009; Marshall and Mkrtchyan 2011).

Conclusion

The analysis of archeological human remains from Armenia stretches back 130 years. Throughout this time, research has mainly been dominated by questions of origins and identity. Late-nineteenth-century research emphasized Indo-European origins, while Soviet physical anthropology focused on Armenian ethnogenesis.

[9] For the newer collections we inventoried and recorded data according to the *Standards* (Buikstra and Ubelaker 1994) as well as Alekseev's program, and also analyzed pathological conditions and evidence of trauma. At the History Museum of Armenia we recorded pathological conditions and evidence of trauma from the crania and human remains.

In both periods, the investigation of archeological remains was linked to questions and debates revolving around modern Armenian identity. In the last decade, Armenian physical anthropologists have begun to incorporate aspects of bioarcheological analysis, moving beyond typological classification and metric analysis. However, most of these approaches have retained an explicit or implicit ethnogenetic framework. Soviet ethnogenesis and American bioarchaeology ask fundamentally distinct questions of the past and are rooted in different conceptions of "population," particularly in terms of time, space, and the relationship between past and present populations. At the moment, Armenian physical anthropologists appear to be drawing on both, raising the question, what will bioarchaeology in Armenia become as it develops?

Acknowledgments I am indebted to Ruzan Mkrtchyan for discussing with me Soviet Ethnogenesis and the history of physical anthropology in Armenia. Indeed, the basis for much of the historical information presented here can be found in our co-authored work (Marshall and Mkrtchyan 2011). However, the views, analysis, and interpretations expressed here are my own and I take responsibility for any mistakes. A more detailed analysis of the topics discussed here will be published in my dissertation. I would also like to thank Ruben Badalyan and Ashot Piliposyan for facilitating my osteological research in Armenia, as well as Adam T. Smith and Maria Lozada for encouraging my research into the intellectual history of physical anthropology of the South Caucasus.

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Chapter 4
Local Trajectories? A View from Down Under

Judith Littleton

In a review of Australian physical (henceforth referred to as biological) anthropology in 1979, Joseph Birdsell began with a classic phrase that has dominated Australian anthropology: "Isolated, a continent inhabited only by hunters and gatherers at the time of contact with Europeans, it presented a unique kind of laboratory for testing evolutionary hypotheses" (Birdsell 1979: 417). He identified the primary interests of biological anthropologists as being the origins of the Australians and microevolutionary forces in one single continent of hunters and gatherers over a long period of time (Birdsell 1979). At the same time, he noted that much of that work rested upon unrepresentative or undated skeletal samples and was directed to questions of origins rather than the more important (to his mind) issue of microevolutionary forces.

In the intervening 30 years, these samples have become largely unavailable for study but there is now the potential for highly specific, local and possibly temporally delimited records of individuals. Research has expanded from what Birdsell (1979: 417) called "poorly formulated" hypotheses of origin, although this remains a dominant theme, to grappling with the research challenges and opportunities of a completely new set of data.

Within that same movement, there has been a partial shift from the biological anthropology of human remains as distinct from archaeology, incorporated at the tail end of reports or in completely separate publications, to a more bioarchaeological focus where the human remains and archaeology are integrated. In this chapter, I trace the shifting relationship between biological anthropology and archaeology, discuss the implications for a developing bioarchaeology and ask why the work undertaken remains distinctly Australian in flavour. In doing so, I focus on work undertaken within Australia.

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An Early Alliance: Culture Equals Biology

Early research in Australia both in archaeology and biological anthropology focused on human variation. Comparative approaches across space were concerned with documenting the level of humanity. For example, early excavations of Aboriginal burials were concerned with finding evidence of ceremony and hence whether Aboriginal people had some form of civilization (Hunter 1788 in Horton 1991: 12). During the nineteenth century, as evolutionary ideas began to be promulgated, these regional comparisons shifted to a consideration of time. Australian Aboriginal people were seen as living fossils as Keith suggested: "More than any other man, the aborigines of Australia and Tasmania seem to have conserved the qualities of the stock which gave rise to all modern breeds. We may look upon him as the best living representative of Pleistocene man" (Keith 1994: 457 [1929]). In Australia, as elsewhere (Daniel 1981), cultural attributes and racial types were assumed to be closely linked.

This early link between archaeology and physical anthropology and ethnography continued through the work of the antiquarian collectors in the late nineteenth and early twentieth century (Griffiths 1996). Despite Childe's criticisms of such a linkage (Childe 1933), the 1930s–1950s fieldwork of Tindale, an Australian anthropologist, and Joseph Birdsell followed this mould. Birdsell's hypothesis of a trihybrid origin of Australia (Birdsell 1967, 1977) was, Tindale argued, evidenced within the archaeological record in a cultural sequence of changing artefacts and burial customs, although he did include the following caveat: "the discussion of physical types is not to be considered an admission that there is a necessary link between the physical forms of men and the cultures they employ (Tindale 1957 in Horton 1991: 269)". Nevertheless, a close link between those studying biological and cultural attributes was maintained with a focus on temporal variation.

Splitting Apart

There were, however, cracks appearing in the structure. The assumption of an inevitable link between culture and biology was challenged in Australia within archaeology.

Mulvaney was the first professional archaeologist to be employed in Australia (in 1953), and his appointment in the History Department, University of Melbourne, marks the first step towards the establishment of departments involved in Australian archaeology. Biological anthropology at the time resided in Departments of Anatomy such as the University of Sydney and the University of Adelaide.

In this chapter "The Stone Age of Australia", Mulvaney challenged the link between biology and culture. He argued that any link between culture and racial type was misleading, particularly in the absence of firmly dated contextual relations (Mulvaney 1961). Furthermore, the increasing antiquity attributed to

archaeological sites and human remains transformed the disciplines of both biological anthropology and archaeology with a renewed interest in the origins and antiquity of the first Australians.

Among biological anthropologists, a separate debate had been occurring between those (such as Birdsell 1967, 1977) who focused on biological variation as evidence of migration from different homelands and those such as Macintosh and Larnach (1976) who argued that the range of variability observed in Aboriginal human remains was evidence of differentiation in situ. This debate moved forward during the 1970s and 1980s without reference to cultural attributes, reinforcing the essential division between archaeology and the interests of biological anthropology. The focus of biological anthropologists was seen as essentially distinct from that of archaeologists as Flood demonstrated:

> Human remains are the province of the physical anthropologist, who finds out about the appearance of prehistoric people and their physical links with other human groups. By a careful study of the form of human skulls – the most durable part of a skeleton – the age and sex of the dead person can be determined, together with their physical affinities with other human populations (Flood 1983: 19).

The splitting of archaeological cultural forms from human remains left the questions of origins and the dating of initial migration as two of the few areas where human remains might contribute to the archaeological narrative.

The separation was reinforced by the nature of the evidence. Many biological anthropological analyses relied upon collections rather than upon remains with a well-dated archaeological context. In his 1964 text, Mulvaney pointed out that there had only been two excavations of human remains which included a complete recording of the burial and the remains [Green Gully and Tartanga (Mulvaney 1964: 156)].

Possibilities of Alliance

Yet in the late 1960s/early 1970s, there was a prospect of this changing. Apart from Betty Meehan's work on burial practices (Meehan 1971), the excavation of remains from Kow Swamp (Thorne 1972), Mungo (Bowler et al. 1970) and most importantly the cemeteries at Roonka (Pretty 1977) and at Broadbeach (Haglund 1976) seemed to give promise of new data and a much finer archaeological record of human remains which could address issues of the adaptation of human populations within a specific region over a period of time. As Macintosh and Larnach wrote in relation to Roonka:

> The completed analysis of this material should provide striking illumination on the range of morphological change which may or may not be expressed in one region continuously over a period of time (Macintosh and Larnach 1976: 123).

These authors were pointing to the possibilities of bioarchaeology where archaeological and biological anthropological evidence were analysed hand in hand and in full consideration of their context (also urged by Mulvaney 1964: 160). Unfortunately beyond preliminary reports of human remains (Pretty and Kricun 1989; Prokopec 1979; Wood 1968), this goal was not achieved; the archaeology of Kow Swamp Swamp has never been fully described, Broadbeach is rarely referred to in archaeological texts (although see Elvery et al. 1998), and despite early reports, a full report of Roonka has not yet appeared.

Yet ideas of regionally specific social, economic and biological change over time were being explored both within archaeology (Lourandos 1980) and within biological anthropology. The 1980s saw the completion of a number of biological anthropology Ph.D. theses that dealt with Australia either as a spatially or temporally variable place: Brown's analysis (1989) of Coobool Creek Skeletons from an unknown site along the Murray River focused on Pleistocene morphology exploring the impacts of cultural and environmental adaptations, while Pardoe (1984) and Webb (1984) used the large museum samples to explore on a regional basis issues of genetic relatedness and health, respectively. All three were, in varying ways, addressing microevolutionary change in the continent in ways heavily influenced by new techniques and perspectives from America. It should be noted that these dissertations were some of the first in biological anthropology undertaken within a department of archaeology. Their work, however, was necessarily tied to two very broad time periods the Pleistocene and the Holocene with Pardoe and Webb's work, in particular, addressing questions of late Holocene change. The analyses deal with Lourandos's hypothesis of social and economic intensification and remain some of the central supporting data (Lourandos 1997) although the temporal resolution for the human remains has not been resolved.

Repatriation

The developing joint research interests of archaeologists and physical anthropologists, however, were affected by indigenous calls for repatriation of human remains. Both disciplines were split (most bitterly probably the return of the Kow Swamp remains, Du Cros 2002: 135) along multiple lines as people took a range of positions: from opposition to repatriation, to a desire to see Aboriginal control but not reburial, to complete endorsement (Langford 1983; Mulvaney 1991; Pardoe 1991; Webb 1987). Many archaeologists embraced these calls seeing skeletal remains as very different from other aspects of Aboriginal culture (Du Cros 2002).

Most states enacted legislation that supported Aboriginal control of their heritage. In order to undertake research, permission is as Pardoe describes it:

> sought from the indigenous community or representative, a clear and concise research outline and the researcher's bona fides are assessed, and permission is granted or denied. There is no single system of assessment and a fair degree of anarchy in some respects varying both on the state and the community involved (Pardoe 2004: 137).

This shift in control had a significant impact on biological anthropology and the development of bioarchaeology. Never large to begin with and marginal at times in anatomy departments, the loss of the skeletal samples has hampered student research hindering research projects at a time when new studies were being developed.

The promise of those new approaches is seen in one text aimed at high school students (Frankel 1991). Frankel trained in Europe and sounds a much more recognizably bioarchaeological agenda. The book is organized around the different types of archaeological evidence and he begins with burials:

> It is appropriate to begin…with a discussion of burials as these remind us that we are discussing people and not simply sites, artifacts or abstract concepts of society and history … With each burial we have one specific event, perhaps only a few hours long. And we have the remains of individual people, about whom we can learn a great deal of personal detail (Frankel 1991: 28).

Frankel's text does not address issues of origin but deals explicitly with the integration of archaeology and physical anthropology. He forecasts very clearly one of the central conundrums researchers are now dealing with—the issue of scale, the role of the individual, and how to cope with multiple records of highly variable resolution.

Bioarchaeology in Practice

The separation of archaeology and physical anthropology in many ways remains very clear. Of eight Australian university departments with a physical anthropologist on staff, six are departments of anatomy (the exceptions are the Australian National University and the University of New England). Yet many students of archaeology do take courses in physical anthropology, and both the meetings of the Australian Archaeology Association and the Australasian Society of Human Biologists have sessions in skeletal biology, while a growing interest in forensic anthropology stimulates a new generation of work.

However, as Pardoe (2004), Donlon (1994) and Cekalovic et al. (2012) have already outlined, it is currently difficult to undertake work with a clear research agenda. Much skeletal work is ad hoc analysis of burials disturbed through development or surveyed as part of broader archaeological projects. However, there have been some systematic projects on burials with a very explicit bioarchaeology focus (Donlon 1995; Littleton 1997; Pardoe 1988a; Pate 2000).

Apart from burials disturbed through development activities, there are in areas of Australia such as the Murray–Darling basin significant problems as a result of the erosion of burial sites (Johnston and Littleton 1993; Littleton 2000). Pardoe started in the mid-1980s a project along the Darling River recording such places with Aboriginal community involvement (Pardoe 1988a). Donlon undertook a similar project but more related to development work on coastal New South Wales (Donlon 1992, 1995), and I undertook research on exposed burials in the Murray–Murrumbidgee area (Littleton 1997).

These projects have involved analysing burials conflated on a landscape in varying degrees of articulation, completeness and recordability. Burials are recorded in situ. The result of this work has forced a very detailed analysis of burial practices in a way that had not previously been undertaken despite the excavations at Roonka and Broadbeach. These are sites comprised of multiple individuals and individual acts, and there is an ongoing discussion about what they mean in terms of formation processes and the actions that create accumulations of burials at one place and not at others. Pardoe (1988b, 1993) has argued strongly for cemeteries as symbols of territory, I have argued for a more temporally specific analysis that burials may act as persistent places indicative of complex relationships between land and social organization (Littleton 2007). Both viewpoints force the analysis of human remains into a specifically archaeological debate about what people were doing in the past, how they were relating to each other—a debate closer to what Frankel (1991) suggested burials offered and far away from the broad continent wide and temporally undefined work described by Birdsell (1979). At this stage, that work has focussed more upon burial practices than other aspects of human remains such as palaeopathology or demography.

At the same time, human remains disturbed during development and as part of these broader projects have been recorded [frequently in the field, less frequently in the laboratory, sometimes dated, sometimes with DNA analysis (Westaway and Burns 2001)]. The resultant detailed records of one, sometimes more individuals, have been written up in plain English reports—so called community reports—which are given back to indigenous communities both to tell the story of that individual and also to demonstrate the value of the work (Pardoe 2004; Wallis et al. 2008).

These osteobiographies constitute individual life histories and are of interest to local communities who express an interest in their ancestors, and a recent paper by Pickering suggests the same role for some of the repatriated remains (Pickering 2010). But they also constitute a very different set of data. Dispersed, highly variable, sometimes inconsistent, even so they represent a significant source of information. Indeed, some have been published as significant finds in terms of their cultural attributes (Feary 1996; Prokopec 2006; Witter et al. 1993) or their pathology (Cornish et al. 2010; Domett et al. 2006) or location. For example, McDonald and co-authors have recently published the analysis of a burial from Narrabeen where the man involved had been speared (McDonald et al. 2007). Others have been placed within the context of completely new sets of data, for example, historical records (Littleton 2003) which have tended to be little used by skeletal biologists or, as in the work by Pretty et al. (1998) measurements of living people along with skeletal measurements.

They create a question of scale, however, that seriously has to be grappled with. How can these potentially highly detailed stories of individuals be placed into a more fully realized past, how can they speak to archaeological and physical anthropological debates rather than remaining curious individuals?

The work on burials has developed frameworks that link individual events to large-scale patterns on the landscape—albeit it not without difficulty. A question now is how to incorporate osteobiographies in that picture. One mode of course is

to wait until a sufficient number are recorded to analyse them within existing data sets, but a more challenging possibility is to think of new research questions which can take these individual stories into a new direction.

Future Directions?

While keeping an eye on this central issue, within bioarchaeology in Australia, there are modes of analysis to be adopted and methods that have so far only been touched upon. The following reflects my own particular biases and cannot be interpreted as a fixed list of possibilities.

First is the need to undertake, if communities give permission, more systematic and informative analysis using a wider range of techniques. In particular, despite work by Hobson and Collier (1984), Pate (2000, 2006), and Owen (2004), there is a surprising lack of isotope analysis. Pate and colleagues have undertaken work on stable isotopes to both elucidate the provenance of skeletal remains (Pate et al. 2002) and the subsistence practices of some communities (Owen 2004; Pate 2000, 2006, Pate and Owen 2013). However, the more detailed work undertaken elsewhere in terms of stable isotopes—life history, intra-community variation—has not yet been explored on a wide scale. Yet these are aspects of skeletal analysis that could be attractive to communities granting permission for one work and also an area where results could be systematically built into larger analyses with minimal destruction.

The same thing (although much more controversially) has been attempted at varying times with DNA analysis (Westaway and Burns 2001). The lack of a major background set of information makes this harder to interpret than the isotope work. However, work to ensure minimally destructive methods also means that it might be a more acceptable form of analysis in the future (Adler et al. 2011), and collaboration with the Aboriginal communities around the Willandra Lakes Heritage area (e.g. Westaway and Lambert 2013) is certainly a start on this work.

Second is the development of new techniques of field recording and non-destructive technologies. Many research projects will still need to record in the field with as little disturbance of remains as possible. Pardoe's work began this trend, and a range of techniques (e.g. taking high-quality dental replicas, mobile X-rays) have been trialed in the field with varying degrees of success (L'Oste-Brown 2002; Moffat et al. 2010). New technologies such as digital scanning technology and OSL dating provide new ways of maximizing the amount that can be recorded with minimal destruction (e.g. Durband et al. 2011). Certainly, the popularity of forensic programs on television has played a role in raising community expectations of analysis.

Third is the integration of human analyses with those of the animals with whom they live (in the Australian context primarily dogs). Pardoe has already analysed dog burials (Tacon and Pardoe 2002), and there have been more recent accounts specifically of dog burials (e.g. Gunn 2012), but work in the Pacific using commensal animals along with humans for dietary analysis (Craig 2009) and work on

stress indicators on animals are all aspects of analysis that could provide information about humans in a much broader context.

While much bioarchaeology work is and will be in the future dominated by small samples, a number of European cemeteries have been excavated as part of archaeological consultancies, and this is an area for bioarchaeological research (Haslam 2003; Donlon et al. 2008; Donlon and Lowe 2013; Paterson and Franklin 2004). For example, a significant number of children's remains were excavated on the site of the Destitute Children's Asylum Cemetery (Prince of Wales Hospital, Sydney) in 1995 with analysis being undertaken by Donlon and Wright (Godden Mackay Pty Ltd 1997). Similarly, the St Mary's cemetery in Adelaide was excavated in 2002 with a complete paleopathological assessment of the 70 individuals recovered conducted (Anson et al. 2002). These studies tend to mirror more closely the concerns of bioarchaeology elsewhere such as the impact of economics or migration upon human health (Anson 2002; Franklin 2012). Encouragingly two major collections (Roonka and Swanport) which were closed for research are undergoing reanalysis (Candy 2004; Owen 2004; Pate 2000; Pate et al. 2002; Walshe 2010). What needs to be avoided in these situations is a repeat of the 1970s when researchers were waiting on Roonka, Broadbeach and Kow Swamp—all those supposed large well-dated samples—to solve our problems. Now more than ever the need is to analyse thoroughly and publish.

Conclusion

In terms of Aboriginal work, the shutdown of collections closed off much that was business as usual but at the same time, it has forced us to re-evaluate how much effort should be spent on hypotheses of origin and direct our attention to a much finer record. Our issue is one of scale: how to take these highly detailed records of individuals and places and address central concerns of hunter-gatherer archaeology and anthropology. It is this ongoing concern with a long time frame, change in place, the use of a very distinctive record and the engagement with indigenous communities that has helped create a distinctly local trajectory.

Australia has had a spluttering history of bioarchaeology. The long history of a British tradition of physical anthropology within schools of anatomy separated those working on human remains from those dealing with archaeology. This separation was beginning to break down in the 1970s/1980s when the issues surrounding repatriation served to marginalize those working on human remains from the broader discipline of archaeology. Yet the persistence of individual practitioners such as Pardoe, projects developed with Aboriginal communities and the developments of archaeological consultancy have all meant that bioarchaeology has persisted. The introduction of new techniques from overseas, however, has been limited by the size of the discipline and the availability of samples while that essentially scanty record and huge time frame create a central interpretive conundrum of scale unique to a "continent of hunter-gatherers".

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Chapter 5
Bioarchaeology in Brazil

Sheila M. F. Mendonça de Souza

First Steps

Physical Anthropology is a subject found in Brazilian scientific literature since the early nineteenth century, when the first prehistoric human remains were found and described. Peter Lund, a Danish naturalist, came to work in Brazil in 1834. His scientific research in the palaeontological sites at the Lagoa Santa region, Minas Gerais State, took many decades. In 1840, Lund published the *Memories* (Lund 1950) describing the findings of mineralized human bones associated with extinct fauna at the Sumidouro cave. He compared what he supposed to be a new skull morphology, discussed the relationships of the ancient inhabitants of the hinterland of the site with those represented by other human skulls and considered the context of human migrations from Asia to America. He also noticed the presence of tooth decay, and what he supposed to be violent skull fractures, caused by a primitive and competitive lifestyle. These were among the first mineralized human remains ever found in Brazil, attracting the attention of scientists from all over the world. The bones were shipped to Denmark, the country that supported the research; only one skull along with a few bones remained in the Historical and Geographical Institute, at Rio de Janeiro. Other researchers and research subjects followed Lund's palaeontological discoveries during the "Museum Era" in the following decades.

The Museum Era

The King of Brazil, Portugal and Algarves D. João VI founded the Royal Museum of Rio de Janeiro (the National Museum of Brazil today) in the years that followed the Royal Family's arrival in Brazil in 1808. It progressed to be a repository for

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Archaeological, Anthropological and Natural History collections. During the second half of the nineteenth century, the skull collections of the museum increased and resulted in an increase in anthropological studies in Brazil. Despite some occasional contributions that preceded the period between 1860 and 1910, this is considered (Faria 2000) to be the initial period of Physical Anthropology in Brazil. According to Souza (1991a, b), Physical Anthropological approaches were applied to Brazilian archaeological collections only after 1850, when scientific staff were organized, laboratories were equipped, and books were bought from more developed countries. Foreign professors like Broca, Quatrefages and Virchow did the analysis of ethnographic and archaeological specimens and took part in the Museum committees (Schwarcz 1993). Most of the Physical Anthropologists were interested in measuring and describing skulls, following then current practice in French and German schools, in order to document and explain human diversity. Aiming to position past and present American native groups in the evolutionary tree, they compared skull morphology, discussing the relationship between ancient Lagoa Santa prehistoric inhabitants and *sambaqui* (or shell-mound) builders. Skulls from living groups such as the Botocudo tribes were also measured for the same purpose (Lacerda 1876). The Brazilian Emperor D. Pedro II (1825–1891), an amateur geologist and Egyptologist, also did his best to improve the development of Brazilian science, contributing to the creation of a favourable climate for Museum staff, laboratories and scientific missions. In 1882, the first Anthropological Exhibition was opened in Rio de Janeiro.

In 1870, a physician named João Baptista de Lacerda (who was in charge of the Section of Anthropology, General and Applied Zoology, Comparative Anatomy and Animal Palaeontology of the Royal Museum) proposed that Lagoa Santa men were direct ancestors of the Botocudo, a native group living in the nineteenth century in the eastern and southern regions of Brazil. In 1877, the same Lacerda offered the first course of Physical Anthropology in Rio de Janeiro. According to Faria (2000), in spite of failing to attract professional anthropologists to the Museum, that course contributed to making anthropology more popular in Brazil. One of Lacerda's paper, *Documentos para servir à história do homem fóssil do Brasil* (Documents relating to the history of fossil man in Brazil) was published in 1875, in the *Memoires de la Societé d' Antropologie*, Paris. Lacerda's assistant, João Rodrigues Peixoto, also a physician, continued the study of skull morphology in the Museum collections. Although a few archaeological missions took place during the nineteenth century, human bones were never the main focus; only a few papers relating to the study of human remains were published at that period (Santos 2002).

Past Decades: More than Bones

Between 1919 and 1930, Physical Anthropology in Brazil entered a period of professional renovation (Faria 2000). A new generation of anthropologists, under the influence of changing political and ideological principles, focused

anthropometric studies on the living population of Brazil. Prehistory had lost part of its appeal to the Anthropologists of that period. The main investigations of that time contributed with scientific support to the eugenics debate, which dominated the interests of Brazilian Physical Anthropologists of the first decades of the twentieth century, with a particular focus on the African origins of some of the population.

On the other hand, most of the ancient bones in the repositories had already been measured a hundred times, leaving few to describe. The most prominent name of this second phase of Physical Anthropology in Brazil was Edgar Roquette-Pinto, a brilliant ethnographer who studied the Nhambiquara tribes from Rondonia State (Roquette-Pinto 1917). In 1926, he organized the second course of Physical Anthropology, focused on Somatology, at the Brazilian Association of Education. In 1929, as the President of the First Congress of Eugenics in Brazil (Schwarcz 1993; Santos 2002), he headed important discussions about eugenics. Although having little interest in bones, he was able to renew the exhibitions of the National Museum, providing illustrated guides to the public and contributing to making Anthropology and Prehistory much more popular in the country.

During the first half of the twentieth century, the ancient mineralized human bones found in Lagoa Santa came to be in the focus of scientific interest once again, with particular attention focused on the putative contemporaneity of humans and extinct mammals. The documented associated sites were revisited with Brazilian missions headed by Padberg-Drenkpol, José Bastos de Ávila and Ney Vidal (Souza et al. 2006). New sites were discovered and explored, adding more human remains to the collections. José Bastos de Ávila, the National Museum anthropologist of that time, published the first Brazilian *Manual de Antropologia Física* (Bastos de Ávila 1958), with a special section on statistics. In 1932, he was able to organize the third course of Anthropology in Brazil, now focusing on somatology.

In the 1940s, two other employees in the National Museum, Tarcísio Torres Messias and Pedro Estevan de Lima, returned to the study of human remains, both from contemporaneous and ancient series. New comparative collections of skulls were exhumed from the urban cemetery of Caju, Rio de Janeiro (Rio de Janeiro State) and from the rural cemetery of Bezerros (Pernambuco State). Helped by the Tenetehara tribe (Maranhão State), Lima also excavated some of their old cemeteries, producing material that was compared to his ethnographic documents. He described the *piranha* teeth, a kind of intentional dental modification of the incisors, possibly introduced among the Tenetehara after the contact with *sertanejos*, the creole people living in the Brazilian countryside (Liryo et al. 2011) or with African slaves (Lima 1954). Ethical considerations apart, plaster moulds of the modified dental arches of the living Tenetehara, as well as the skeletal specimens exhumed at the old cemeteries, are certainly among the interesting collections in the National Museum. Lima was a pioneer of the study of dental modifications among Brazilian Indians (Cunha 1968).

Another name in the same period was Luiz de Castro Faria. In 1951–1952, he performed one of the first scientific excavations in Brazil at the Cabeçuda shell-mound. He provided an important collection of human skeletons to the National Museum (Faria 1952; Alvim and Mello Filho 1965; Souza 1991a, b;

Rodrigues-Carvalho 2004). During the decade of 1940 and 1950, Biological Anthropology developed as an independent disciplinary field in Brazil. Genetics, evolution, pathology, somatology, nutrition and other themes were subjects for investigation, but most of the osteologists were still just measuring bones. The main research approaches in the National Museum were craniometrics of *mestiços*, somatometry of the Xingu Indian groups (Lima 1954) and the palaeoanthropology of shell-mound builders (Faria 1952). Meanwhile, new courses were proposed, and university anthropology programmes were adapted to the Four Fields approach to the discipline. As a result, physical Anthropology was included in more than 40 programmes of Brazilian universities, including the introduction of basic principles regarding evolution and genetics to the undergraduate careers of students of geography, history and the social sciences. According to Faria (2000), this multidisciplinary approach failed because the students of humanities lacked basic biological knowledge and, as a result, most Physical Anthropologists in Brazil continued to emerge from biomedical backgrounds.

Recent Decades: Back to the Bones

Two decades after World War II, Brazil had a period of economic growth and the Universities expanded during the period of military government that began in 1964. The subsequent political changes strongly affected academic developments during the next decade, with a particular impact on the fields of sociology and anthropology (Funari 2002; Souza 1991a, b). When Alfredo Mendonça de Souza initiated the first Brazilian undergraduate course in Archaeology in the 1970s, anthropological approaches were excluded from the syllabus for political reasons. On the other hand, Federal Law number 3,924 of 1961 marks the beginning of state protection for archaeological sites, also contributing to the organization of the field and academic interventions. Since them, archaeological excavations have progressed, as has the study of human remains.

In the National Museum, a new anthropologist named Marília Carvalho de Mello e Alvim brought a new impetus to the study of ancient human bones. For the first time, it was not a physician dealing with bones (Powell et al. 2006). Alvim focused her research in osteometrics, improving knowledge about the ancient skeletons of the shell-mounds, of the Lagoa Santa caves and other prehistoric sites, and this work became a major reference for Brazilian osteology. Updating conventional osteometric methods, she tested hypotheses of biological continuity between prehistoric groups (Alvim and Mello Filho 1965; Alvim and Seiferth 1969). At the end of 1970s, she published with Cleber Bidegain Pereira the first Brazilian manual of craniometrics, although multivariate analyses were not included (Pereira and Alvim 1979). In the 1970s and 1980s, she published with other authors about palaeopathology, epigenetics, evolution and palaeodemography (Uchoa and Alvim 1989). A complete list of her papers is in the volume edited by Buikstra and Beck (2006). She was the first to study the Lagoa Santa palaeoindian *Luzia,* confirming

that the skull, the fragmentary bones and the mandible recovered in the rock shelter belonged to the same individual. She defended the biological unity of Lagoa Santa prehistoric groups, explaining the lack of mongoloid traces by the extreme variability in Amerindian morphology (Alvim 1977). Teaching anthropology at the University in Rio de Janeiro State and working as a researcher at the National Museum, she inspired a whole generation of Brazilian anthropologists.

One of Alvim's students was Lilia Cheuiche Machado, who worked at the Institute of Brazilian Archaeology (Powell et al. 2006). She was one of the first Brazilian bioarchaeologists trained at the Smithsonian Institution. She introduced Kerley's method of age estimation, electronic microscopy for tooth analysis and Life Tables for palaeodemography in the study of the Brazilian prehistoric series (Machado 1984). She also discovered the first dental evidence of horticulture in a coastal prehistoric site (Turner and Machado 1983). Machado was the first true Brazilian bioarchaeologist, since she personally excavated funerary sites, interpreting the remains from the field to the laboratory. She also published about the archaeology of funerary sites and taphonomy among other interests (also listed in Buikstra and Beck 2006).

According to Souza (1991a), 15 % of Brazilian archaeology papers published between 1975 and 1985 were about human remains with almost half of those concerned with palaeopathology, an emerging academic field of research between the 1960s and 1970s. As in other countries, palaeopathology in Brazil became a substantial part of bioarchaeological investigations. Thanks to the contribution of three pioneers, palaeopathology developed fast in Brazil. Ernesto de Mello Salles Cunha was professor of Dental Pathology at Fluminense Federal University, in Niterói. He studied the teeth of Lagoa Santa and shell-mound groups to understand dental decay and its relationship to diet, mastication and cultural patterns. He also discussed genetic causes for low caries rates in some shell-mound assemblages. He excavated some archaeological sites and founded a Museum with a palaeopathology collection. He also published in journals of odontology for more than a decade (e.g. Cunha 1963, 1968). Bone palaeopathology was formally included in academic institutions as a discipline of the Faculty of Archaeology Estácio de Sá, in a private university. That new field of research was developed by the current author (Ferraz 1977) under the supervision of the bone pathologist Claudio Lemos, the most prominent professional of his time in Brazil. The former's association with national and international academic groups assured the improvement in the field, inspired by Wells, Brothwell and Allison among others (Souza 1995, 1999, 2008; Souza and Guichon 2012; Souza et al. 2008). The cooperation with different teams doing field and laboratory research in archaeology was reinforced and an increasing number of both undergraduate and graduate students of archaeology, zoology, biology, medicine and others taking classes dedicated to the study of human remains in recent years. In the National School of Public Health, Sergio Arouca of the Oswaldo Cruz Foundation, along with Luiz Fernando Ferreira and Adauto Araujo, introduced palaeoparasitology

research to Brazil (Ferreira et al. 2008). Initially at the Department of Biological Sciences, these laboratories are now at the Department of Endemic Diseases in the same institution. Inspired by Olympio da Fonseca Filho and encouraged by Aidan Cockburn, Mirko Grmek, Arthur Aufderheide and others, they created a solid and productive research group, maintaining cooperation with different laboratories at Brazilian universities and with international institutions such as Nebraska University, Indiana University (USA); Coimbra University (Portugal); Reims University (France); Tarapacá University (Chile) and many others.

Fifty years after publishing the first studies in palaeopathology in Brazil, Fiocruz is the main reference in Brazil for palaeopathology, palaeoepidemiology and palaeoparasitology. Our graduate programmes accept national and international students, and we maintain links with graduate programmes at the universities providing courses inside and outside the country while also receiving colleagues from different countries for scientific cooperation and classes. Scientific events, exhibitions, editorial programmes and activities help promote palaeopathology. Financial support comes from the Fulbright Commission, CNPq (National Council for Scientific and Technological Development), CAPES (Coordination for Supporting Research and Graduate Programs) and funding agencies from different South American countries. Scientific publications have been in both international and national journals (Araújo et al. 2003; Souza et al. 2006) and books (Araújo et al. 2011; Souza 2011).

Walter Neves is another Physical Anthropologist who began his career in the 1980s at the Institute of Prehistory, São Paulo University. Returning from his graduate education in the USA, he contributed with refreshing ideas such as the introduction of multivariate analysis in osteometrics. He also contributed to the curatorial programmes of bone collections (Neves 1988). His project in Chile, to study the Atacama skeletal collections, was the first biocultural project by a Brazilian specialist and was an important contribution to the introduction of this kind of approach to Brazilian academia (Neves and Costa 1987). In the twenty-first century, his bioarchaeological research programme has focused on the Lagoa Santa skeletal remains and the archaeological work in that region has been very important. Dating human bones and archaeological sites while also revising dental and skeletal morphology of that non-mongolized stock of populations has contributed to microevolutionary debates concerning the prehistoric peopling of the Americas (Neves et al. 2007). Neves heads a Laboratory of Human Evolutionary Studies at University of São Paulo and has made a significant contribution to the development of bioarchaeology in Brazil, reviewing American Museum collections in national and international research projects (González et al. 2008). Neves, who was a former President of the Association for Latin American Biological Anthropology (ALAB), has also contributed to the development of the field in other South American countries.

Developing Bioarchaeology

As noted above, it was during the 1960s that bone studies started to progress again in Brazil. Since then the number of papers and dissertations involving funerary archaeology, human remains, taphonomy, osteometrics, microevolution and different fields of palaeopathology have increased rapidly. More Brazilian students graduated from universities outside the country. Brazilian academics took part in international scientific missions and training programmes, presented their results in scientific meetings such as the Palaeopathology Association Meeting, the World Mummy congresses, the Annual Meeting of the American Anthropological Association among others. Colleagues from different countries, such as Karl Reinhard, Jane Buikstra, Eugenia Cunha, Della Cook, Ricardo Guichon among others, have been invited to teach in Brazil as well as to take part in committees, meetings or in research programmes. Dating archaeological human remains is now more readily available, helping to contextualize results in a proper time and space perspective. This is especially the case for shell matrix sites with their complex stratigraphy. Diverse and complementary studies of human remains in their archaeological contexts by specialists are helping to build biocultural perspectives articulating culture, environment, disease and demography. The analysis of microfossils in dental calculus and isotopes from bone and teeth provide linkages with palaeobotany, helping to build a better reconstruction of palaeonutrition and the economy of prehistoric groups.

At the beginning of the twenty-first century, funerary archaeology is an important focus. The concept of studying human remains under the bioarchaeological approach is being incorporated to archaeological research with specialists in human bones contributing more and more to fieldwork. Duday's *Anthropologie du terrain* is the basis for an adapted methodology for field and laboratory work of excavation and interpretation of human remains in situ (Carvalho et al. 1999). Bioarchaeological protocols for funerary remains are tested while systematic or opportunistic sampling is also now included in excavation routines aimed at the study of palaeoparasitology, microresidues and aDNA. The concept of bioarchaeology as the study of the human remains starting in the field is becoming incorporated into the wider discipline of archaeology. After almost two centuries of Physical Anthropology, Brazilian bioarchaeologists are finally closer to the archaeologists, contributing their own questions, hypotheses, methods, techniques and skills to the research.

In 2002, Neves started the project *Origens e Microevolução do Homem na América: uma abordagem Paleoantropológica* (Neves et al. 1999) in order to review some of the major challenges of bioarchaeology in Brazil, such as who were the Lagoa Santa ancient groups? Were they contemporaneous to the extinct fauna? In 2007, the present author started the project *Escavação do Sambaqui do Cubatão I para fins de Análise Paleodemográfica e Paleoepidemiológica* to answer questions about sambaquis funerary structures, palaeodemography, palaeodiet and palaeoepidemiology. A bioarchaeological approach in the excavation of the Cubatão

I shellmound is integrating different archaeologists and bioarchaeologists from a number of institutions such as University of São Paulo, Fiocruz and the Joinville Museum of Sambaqui.

Graduate programmes in history, anthropology, archaeology and anatomy in different institutes such as the Archaeology and Ethnology Museum at the University of São Paulo, accept theses and dissertations in bioarchaeology. A programme in Medical Genetics at the Federal University of Pará, in Brazilian Amazonia, is producing graduates in palaeogenetics. Claudia Rodrigues-Carvalho represents the new generation of bioarchaeologists of the twenty-first century at the National Museum. There have also been occasional contributions from Martha Mirazón Lahr in São Paulo University (Eggers and Lahr 1998).

Some names in the new generation are Sabine Eggers, working at the Institute of Biosciences/University of São Paulo; Mercedes Okomura, also at the University of São Paulo (Okomura et al. 2006). Max Hubbe, Pedro Tótora and André Strauss are former students of Walter Neves, working at the University of São Paulo. Celia Boyadjian, a student of Sabine Eggers, also works at the University of São Paulo. Sérgio Silva and Olívia Carvalho are teaching and researching at Federal Universities in the States of Pernambuco and Sergipe, North-eastern Brazil. Silva graduated from University of São Paulo while Carvalho received her degrees from Geneva, Switzerland. Glaucia Sene is working at Rio de Janeiro and cooperates with the National Museum in Rio de Janeiro having graduated from the University of São Paulo. Claudia Rodrigues-Carvalho, Andrea Lessa, Andersen Liryo, Marcelo Gonçalves, Alena Iniguez, Daniela Lelles and Veronica Wesolowski graduated from Fiocruz, Rio de Janeiro. They are now teaching and researching at Universities in the same city, except for Wesolowski who is teaching and researching at the University of São Paulo. The number of specialists dedicated to bioarchaeology in Brazil is increasing rapidly.

The main themes in Brazilian bioarchaeology include the following: the origin and microevolution of prehistoric and modern groups; taphonomy and funerary rites; diet and dental decay; diet and microresidues of food in dental calculi; the origin and evolution of endemic Chagas disease; group mobility; health changes associated to the occupation of the coast; as well as the biological impacts of the contact between ceramic and pre-ceramic groups.

Archaeological sites are protected by law, and this extends to funerary sites and human remains. An increasing commitment to different ethnic conceptions of heritage, considering the Brazilian multicultural reality, makes it more and more important to discuss the excavation of a burial area with culturally related Indian or Afro-American communities. In some cases, burial excavations have been refused, even when forensic purposes were involved. In many cases of historical cemeteries, especially in ecclesiastical sites, the reburial of bones was demanded. In other cases, the excavation just exposed the remains but did not involve their removal from the soil. Despite these cases, in general ethical debates have had a low impact on prehistoric research programmes. Although Physical Anthropologists have occasionally given evidence in court, Forensic Anthropology is still emerging as a specialized field in Brazil, with the first undergraduate programme

now in place. Otherwise, there is a general agreement aiming for the non-destructive and non-invasive analysis of bones and most curatorial programmes are very conservative in relation to the human remains. The expansion of courses, as well as more institutional control of professional training, is currently under discussion. Increasingly archaeological and forensic demands are pointing the route to the future of bioarchaeology in Brazil.

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Chapter 6
The Biology of Early British Populations

Don Brothwell

In Britain, there was a growing local interest in the antiquity of human remains by the first half of the nineteenth century. Both geologists and archaeologists were becoming aware of cave finds of animal bones and prehistoric monuments and mounds. Members of the leading scientific establishment, the Royal Society, began to take an interest regarding human antiquity. In the 1820s, William Buckland, a geologist and religious man, began investigating caves such as Kirkdale in Yorkshire. Others followed and Kent's Cavern in Torquay was initially dug in 1825. By the 1830s, Darwin was already questioning whether biblical creation time could really be related to evolutionary time. Excavations extended to Neolithic and Bronze Age barrows and later cemeteries, the bones showing evidence of people not altogether the same as living Britons.

The study of these human remains has been mainly in the hands of British anatomists in the past, but during the last half century, bioarchaeologists have generally taken over. Medical schools have become more and more concerned with cell biology but current investigators are mainly working in British departments of archaeology. Early studies were concentrated in Oxford, Cambridge and London, but an increasing number of British universities now view human remains as a fruitful research field. While morphological variation over the past five millennia is mainly of interest to the British archaeological community, studies on bone and tooth pathology have had a more worldwide relevance, being seen also as a part of a broader medical history.

Because there has been considerable skeletal reporting and research activity over the past three decades, the amount of information on early British populations is now enormous. My task here has therefore been to avoid drowning in the site minutiae, but to review, summarise and evaluate all the biological information to achieve an overall impression of where we are in the study of early British populations. We have come a long way since the early studies of the nineteenth century,

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and the breadth and emphasis have changed. It is clear that in some respects, we need much larger samples to appreciate the real significance of differences. There are also various questions that still need to be investigated. And we are still far away from establishing an agreed methodology for defining, presenting and analysing data on early British populations, which everyone will adopt. Early in the 1900s, there was a strong osteometric bias, but by the 1950s palaeopathology was the main emphasis of studies. The balance is slowly getting better, with demography and even growth studies contributing to a broader and more mature field of work.

Nineteenth and Early Twentieth Century Studies

Through the energies of various British antiquaries, human skeletal material was available for study early in the nineteenth century. At first, reference to early British populations was somewhat casual but by the latter half of the century, osteometric methods were applied and the results published. It is noteworthy that even in these early studies, it was not purely a matter of measurement and simple racial classification. Some thought was already being given to the plasticity of skeletal structures and the effect of environment upon bone growth (Latham 1852).

One of the earliest comparisons involving British material was by Sir William Wilde (1844) in an essay on *The Ethnology of the Ancient Irish* (see also O'Donnabhain and Murphy, this volume). Influenced by Professors Retzius and Eschricht of Scandinavia, his main contribution was to emphasise the differences that may be noted in early British and Irish skeletal material, and to suggest the possibility of physical change through time. In a report on the Saxon skeletons from Lamel-Hill, near York, Thurnam (1849) further emphasised the importance of studies concerned with excavated skeletal material in this country. Employing the terminology of Retzius, he described the Lamel-Hill group as Dolichocephalae orthognathae (as opposed to Brachycephalae and prognathae). Thurnam notes also the 'large' stature of these skeletons, 'agreeing…with the well-known large stature of the early Anglo-Saxons' (p. 12). He also comments on variations in the degree of dental attrition to be found in Saxon, Romano-British and Bronze Age skulls.

The 1860s saw an acceleration of work on early British material. Webb (1860), in a comparative study of the teeth of various world populations, commented on the size variability to be seen in Anglo-Saxon jaws. He also noted the considerable attrition to be seen in pre-Roman and Anglo-Saxon teeth compared with recent British teeth, a difference which he ascribed to dietary variations. Caries, he stated, was a 'frequent disease amongst the Aboriginal British and Anglo-Saxons' (p. 57).

The completion of *Crania Britannica* by Davis and Thurnam (1865) was a milestone not only in terms of British prehistoric studies, but also because this massive compilation set a world standard in anthropological care and method. Eighteen measurements of the skull were tabulated for 261 specimens (196 ♂, and 65 ♀), which ranged in date from Neolithic to Anglo-Saxon. Although

measurements were only taken to tenths of an inch, and there is some doubt as to the accuracy of the craniometric equipment employed, they nevertheless provided for the first time a comprehensive review of the information then known on early British populations. Of special note was the caution of their conclusions as regards the skeletal material.

In the same year as the completion of *Crania Britannica*, further studies were appearing, worth mentioning only in so far as they further supported the idea of cranial variability in Britain throughout time. It was in the following year, 1866, that the first full description of the so-called 'River-bed type' was published by Professor T. H. Huxley as a part of a lengthy analysis of human remains from Caithness. This 'type' he considered to have been widespread in Britain 'at one time', and commented on their similarity to Neolithic long barrow skulls (Huxley 1866). It is a surprising fact that this term remained in use well into the last century, although the variety of skulls so labelled may well range over a time span of four or five thousand years. Unless dated by artefacts, faunal or radiocarbon methods, such specimens can be of no comparative value, and no further consideration will be given to them in this study.

The extensive analysis by the anatomist Rolleston (1877) of skeletal material excavated by William Greenwell from a number of British barrows provided a further significant contribution to nineteenth-century studies in that field.

The work of John Beddoe between 1865 and 1900 was one of the best contributions of the nineteenth century to the study of early and modern British populations. In particular, his book, *The Races of Britain. A Contribution to the Anthropology of Western Europe* (1885), was of special importance. For his day, he was a remarkably careful observer, and he was fully aware that preconceived ideas as to what constituted 'typical' physique at a particular period could seriously bias skeletal comparisons, especially as the samples were so small. He re-emphasised the need to keep in mind possible cradling practises, known to have occurred in Europe during historic times, when considering skull shape (for another perspective on Beddoe's work, see also O'Donnabhain and Murphy, this volume).

In the following year, the Journal of the Royal Anthropological Institute contained two important studies—that is, relative to the time of their publication. Horton-Smith (1896) measured and compared 59 Anglo-Saxon skulls from three broad areas of England and concluded that: (a) the Wessex Saxons were more heterogeneous than the South Saxons; and (b) the Bristol Avon area was mainly 'pre-Saxon' in type. The analysis of Myers (1896) was based on a series of 63 skulls, found at a site near the village of Brandon, Suffolk (remains of 120 individuals have now been recorded from this site). The dating of this series is far from satisfactory, although a survey of East Anglian skeletal material tentatively recorded this group as Anglo-Saxon—presumably Christian, as there were no grave goods. However, it is most anomalous to find late Saxon bodies equally commonly 'lying over, parallel to, or across each other' (Myers 1896, p. 114), and one is left questioning whether these might be early Medieval gallows victims.

It may be mentioned that although the skull was the main area of interest, variability of the post-cranial skeleton had also commenced. Davis and Thurnam gave long-bone measurements for the prehistoric and early historic British. Their stature findings were later challenged by Mortimer (1877, and stated again in 1909), whose small samples led him to believe that the reverse of their conclusions was in fact the situation, and that the Neolithic population was taller than the Bronze Age people. The classic study 'On the Reconstruction of the Stature of Prehistoric Peoples' by Pearson (1898) at last placed such height estimates statistically on a much firmer footing. His mean stature estimates for Neolithic Bronze Age, Romano-British and Anglo-Saxon series range from 166.7 to 171.1 cm, confirming previous statements as to the possible stature variations of earlier British groups.

The turn of the century saw a gradual but marked increase in the standard of skeletal reports and detailed osteometric analyses. The 'romantic' gave rise to a more scientific approach to the study of bones, including an increasing consciousness of methods of measurement.

During the first decade of the last century, the anatomist, William Wright made by far the most important contribution to the study of the early British. His study of Iron Age skulls from the so-called Danes' Graves near Driffield, Yorkshire, demonstrated clearly that with the advent of this new culture complex, noticeably different physical variation existed. Later, in 1906, he provided further evidence of this northern English population, confirming his earlier work. During 1904–1905, Wright published a detailed study of Bronze Age skulls from East Yorkshire, and contrary to the general feeling of the day, stated in his conclusions that these early Bronze Age people seemed likely to have been heterogeneous *before* arrival in Britain—and not the result of indigenous British 'long-heads' mixing with an intrusive 'pure' brachycephalic element. A similar descriptive catalogue with measurements was, incidentally, produced by Schuster (1905) and dealt with all Neolithic and Bronze Age skulls in the Department of Comparative Anatomy at Oxford.

The work of W. R. MacDonnell was particularly valuable during this first decade of the last century. His studies of the Whitechapel (1904) and Moorfields (1906) series provided for the first time detailed statistical evidence on reasonably large samples of the London population living about three centuries ago. Whether representing a regional change or otherwise, his studies demonstrated the 're-assertion' of a distinctive long-headedness; his results being substantiated by the later study of a similar London series by Hooke (1926). The puzzling fact that they differed so much (on average) from the now known medieval samples was not appreciated, however, at the time. Except for a few reports on small samples, it was not until 1908 that a medieval series received detailed study. In that year, the anatomist, F. G. Parsons, published his 'Report on the Hythe Crania', which gave craniometric data on 590 specimens. Although historical documentation does not provide a firm date for this Kent series, it is highly probably that it is restricted in time between A.D. 1100 and 1600. His claim for a somewhat brachycephalic and high-vaulted medieval south-east English craniometric form was supported by a re-study by Stoessiger and Morant (1932).

The anthropologist, W. L. H. Duckworth, who published a number of reports on British skeletal material between 1905 and 1927, also contributed to the study of the British medieval population (Duckworth and Pocock 1908). These 32 fragmentary Cambridge skeletons, thought to be from the site of an Augustinian Friary, were compared with other medieval material, and it was clear from this evidence that the noticeable increase in brachycephaly during the medieval period was no isolated phenomenon, but had affected much of England. This early and often limited data suggesting physical change at a medieval date received yet further support from the more detailed work by the anthropologist, Buxton (1937), on a number of medieval series from southern England; also by the extensive biometric study of over 50 medieval skeletons from Castle Hill, Scarborough in the northeast (Little 1943).

Since the middle of the nineteenth century, a considerable number of restricted skeletal finds had been reported from Scotland, especially from the so-called 'short cist' thought to be mainly of Bronze Age date. Studies on this Scottish material culminated in the production of a detailed monograph by Sir William. Although his sample number for any one period was small, he was nevertheless able to demonstrate a similar pattern of change through time in Scotland as in England, even though the population origins may not always have been the same. Turner also provided data on more recent Scottish skulls, later to be utilised for the computation of pooled means by Morant (1928) with the addition of a further important series from Western Scotland (Young 1915, 1931). Since then, only two major studies have been published on Scottish material, namely, on short cists by Reid and Morant (1928) and on long cist burials in the Lothians by Wells (1956–1957).

Relative to his studies on fossil human remains, the anatomist, Sir Arthur Keith, contributed but a small amount to the study of early British populations, although a number of papers and reports were published between 1911 and 1931. Probably, the most important of these was his study of the Coldrum Neolithic series (1913)—badly damaged by Nazi bombing in World War II—and his Presidential Address (1915b) on 'The Bronze Age invaders of Britain', read to the Royal Anthropological Institute. In the latter, he stated his belief that the individuals buried in the round barrows and short cists were a distinct social (and physical) group ruling lower social strata of a predominantly indigenous Neolithic physical type.

These studies called attention again to the need to consider Iron Age material separately as a probably homogeneous series, and apart from the Romano-Britons who by their nature and origins seem always likely to present considerable difficulties in analysis. Only one large Iron Age Series was excavated and studied biometrically (Goodman and Morant 1940) in this pre-war period.

The work of G. M. Morant has already been mentioned. Following the high standards of earlier biometric workers at University College, London, he did much to clarify the problems of physical change in Britain—though relying somewhat heavily upon the coefficient of racial likeness (C.R.L.) of Pearson. His 1926 Biometrika study of Anglo-Saxon material included the recalculation of a number of other early British population means and a general comparison of these earlier

groups. His conclusions were restated in a paper with Beatrix Hooke (Hooke and Morant 1926).

Buxton (1935) provided a useful first analysis of the Romano-Britons. He presented data on a restricted number of vault dimensions for over 300 male skulls dateable to the Romano-British period. In order to see whether these data showed regional variation, he split the measurements and produced means for nine 'tribal' areas (the sample numbers being in only three cases greater than 40, namely, for the Belgae, Dobuni and Brigantes). Although Buxton pointed out that communication was very good during Roman times, which may well have facilitated some population movements, nevertheless he claimed distinctive features in at least some groups.

The contribution of Howells (1937, 1938) to the palaeoanthropology of earlier British populations was twofold. His analysis of the origin and affinities of the British Iron Age population, and its contribution to the hereditary 'background' of later generations, provided useful new ideas about the hybridisation of intrusive and 'indigenous' groups and the relative influence of a particular group element.

Human Bioarchaeology in Britain Since 1944

After World War II, there was a resumption of skeletal studies, but although numerous general reports appeared on human remains from archaeological sites, detailed comparisons and broader syntheses were relatively few.

The detailed examination of British Neolithic material by Fereday (1956) provided revised craniometric means for chambered long barrow, unchambered long barrow and 'combined' Neolithic samples. She demonstrated that, craniometrically at least, there is no clear evidence that the population of Britain during this period was heterogeneous. Wells (1956–1957) reported on the long cist burials from the Lasswade cemetery (c. A.D. 700–1240) and discussed in metrical terms the physical characteristics of the long cist people of the Lothians—as far as the inadequate evidence permitted. He argued that, on the craniometric evidence, these long cist people could be derived satisfactorily from the hybridisation of short cist, Iron Age and Anglo-Saxon elements.

The general review of the Bronze Age skeletal material from Yorkshire (Brothwell 1960a, b) was an attempt to demonstrate the range of human biological information which could be obtained from a regional British prehistoric population, as well as to point to the present inadequacies of such collections. Finally, as regards oral studies, Goose (1962) studied palatal variability—especially metrical—in Britain from Roman to modern times. His results supported some of the earlier evidence provided by Keith (1924) and demonstrated a significant reduction in palatal widths during the past few centuries. Miles (1962) re-emphasised the value of dental attrition in assessing the ages of earlier British populations.

I have considered at some length the earlier studies on ancient British populations over the past 5000 years, but attitudes towards the study of earlier skeletal series have changed and are no longer simply craniometric in orientation (Brothwell 1968).

In terms of the immigration of people into Britain, it is likely that significant numbers arrived from other parts of Europe in the Neolithic, the Bronze Age, the Iron Age and Roman times, with the Saxons, Danes and Vikings also contributing regionally. Their degree of spread was very variable, as was their biological impact. As regards sex ratios for adults, comparison of a range of world archaeological samples suggests that there is no significant difference unless there have been social factors influencing burial (Brothwell 1971). Age group composition can also show bias, in this case because the burial environment is destructive of infant bones, or because attitudes of the community prevent some children being buried in a cemetery, or with the adults. Life expectancy at birth has been estimated for a number of archaeological samples as 19–20 years, and this had increased in Britain to 36.4 years by 1600 (Houston 1992). Often young children are poorly represented, and of course, standards of care and feeding could have been very variable. Further demographic studies are certainly needed, including variation in the age group composition of children (Brothwell 1987; Lewis 2007). Similarly, average lifespans for early British adults (Brothwell 1972) need re-evaluation. For instance, my own estimates for Wharram Percy adults are lower than the data suggested in Mays (2007), where far more individuals are recorded as over 50 years.

Biodistance and Osteometric Analysis

British metrical studies have a long history and are exemplified by studies on the London series (Hooke 1926), Scottish short cist assemblages (Reid and Morant 1928), a medieval Hythe sample (Stoessiger and Morant 1932), Anglo-Saxons from Bidford and Burwell (Brash et al. 1935), and in post-war years people from Roman Cirencester (Wells 1982) and Poundbury (Molleson and Cox 1993), Dark Age Cannington (Brothwell and Powers 2000) and medieval Wharram Percy (Mays 2007), to name a few.

From all the measurements and means now calculated on early British skeletons, it is clear that over time, there has been a considerable amount of microevolutionary change, probably modified by the movement of people into Britain since the Mesolithic period (Mays 2000). The use of osteometric data to show the impact of new intrusive groups, such as putative Beaker people, on the indigenous Neolithic people is not altogether accepted, but the degree of variation between Neolithic and Bronze Age skeletons is such that the latter group is very unlikely to be simply derived from the former (Brothwell 1973; Brodie 1994). Similarly, the craniometric differences between Anglo-Saxon groups and later medieval people are not easily explainable in terms of rapid microevolution (Brothwell and Krzanowski 1974). Prior to recent times, the Romano-British population was probably the most

heterogeneous of all periods and this has stimulated interest in identifying the nature of the diversity. Leach and colleagues (2009) have attempted to identify some of this diversity, and in particular considered that more than 10 % were probably of African descent. Statistically, this poses a considerable problem, but a start has been made.

It has been suggested that only the cranial vault measurements are useful in discriminating between early population samples, but this is incorrect, as seen in Figs. 6.1 and 6.2. Here, upper facial dimensions are compared for Saxon and later medieval groups by canonical analysis, to show considerable variation in both males and females. Similarly, mandibular dimensions are combined in canonical analyses for males and females and again show notable variation.

Comparative studies on a number of Yorkshire medieval cemeteries (Dawes and Magilton 1980; Mays 2007) are presented as cluster analyses in which there is some differentiation, but not the marked difference seen in some comparative samples (Fig. 6.3). The cluster sequence differences between males and females raise the question whether this is a reflection on the degree of exogamy in these communities? It is a problem that at least deserves further investigation.

Compared to the skull measurements, the post-cranial dimensions are not so variable through time, and stature has received the most attention. Other metrical studies include jaw size changes through time (Goose 1962), child growth variation (Miles and Bulman 1994; Hoppa 1992; Mays 1999; Lewis 2007), frontal sinus differences (Buckland-Wright 1970), asymmetry and work influences (Stirland 1993; Steele and Mays 1995).

Non-metric (Epigenetic) Traits

Early British skeletal studies, particularly those reported in Biometrika, made some comment on the occurrence of non-metric features, especially metopism and wormian bones. But, the potential discriminatory value of these traits, especially when considered multifactorially, was not appreciated until a number of early British populations were included in a study comparing biological distances derived from osteometric data with non-metric values (Brothwell 1958). The results suggested that non-metric traits might be better at discriminating between local regional populations (e.g. Saxons, medieval English) while osteometric dimensions were of more value in comparing larger geographic regions or perhaps samples extending over considerable time.

This did not absolve researchers from the problems of aetiology, and although there have been family studies (Sjovold 1984), the degree of gene control of such traits remains a matter for debate. Some traits, such as single or multiple foramina, may be pleiotropic and secondary to other more primary growth factors, but this does not mean that they have no biological value. It is interesting that some traits may cluster together at particular burials or groups of graves, and it is reasonable to argue that these may be indicating family groups. Such a conclusion is

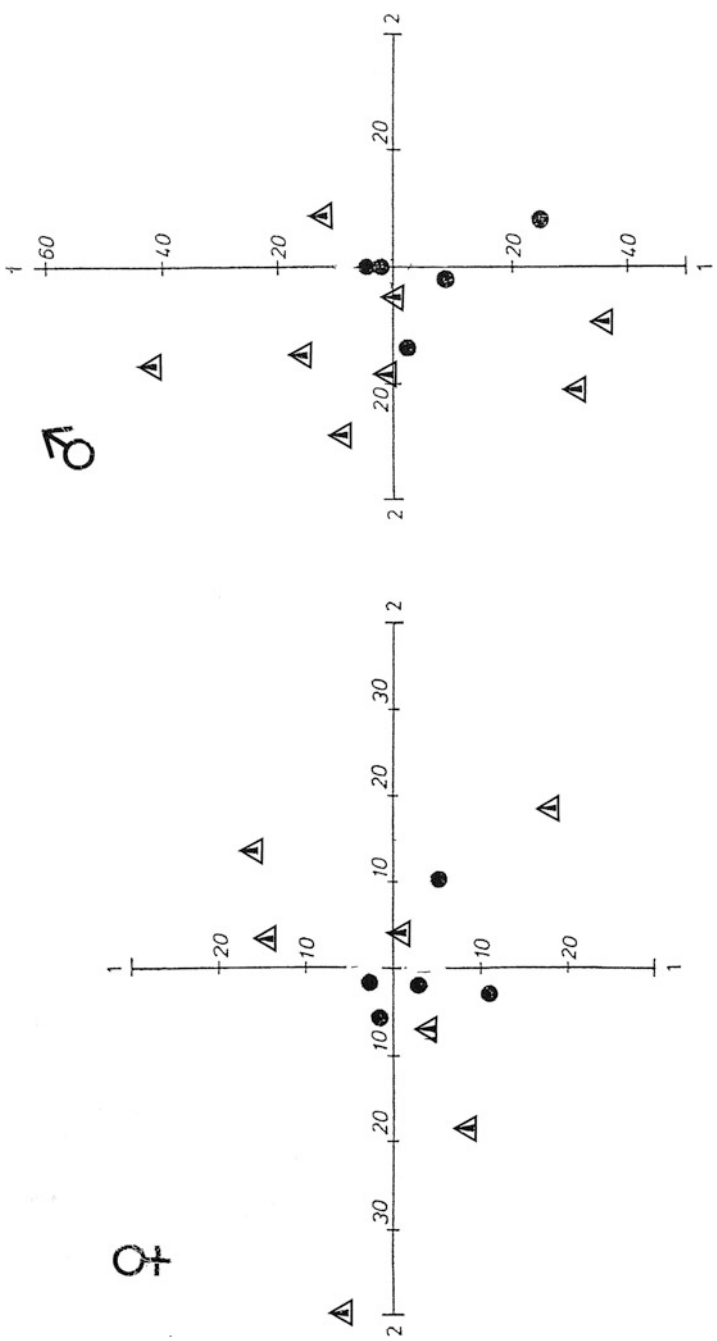

Fig. 6.1 Canonical analysis of upper facial variation in a number of male and female Anglo-Saxon (*filled circle*) and Later Medieval (*triangle*) British populations. Measurements defined in Brothwell (1981)

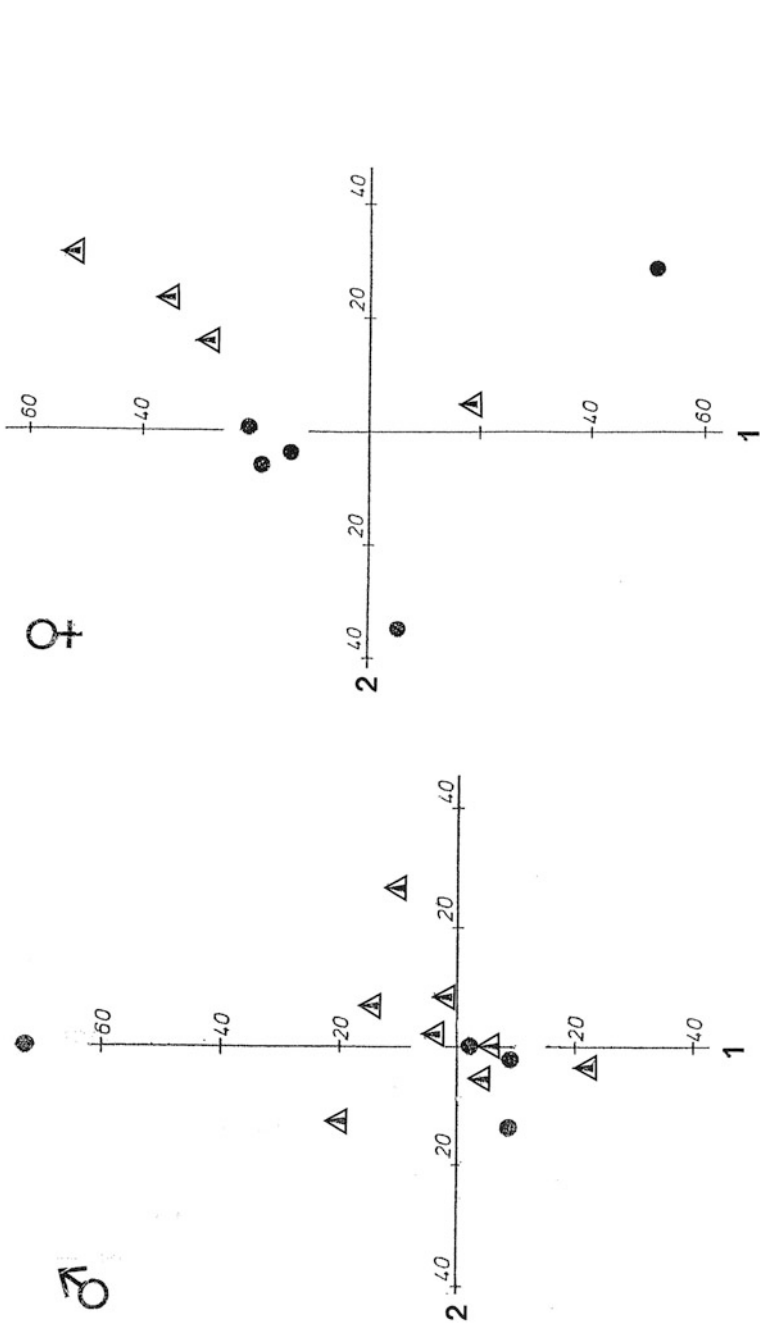

Fig. 6.2 Canonical analysis of mandibular measurements in a number of male and female Anglo-Saxon (*filled circle*) and Later Medieval (*triangle*) British populations. Measurements defined in Brothwell (1981)

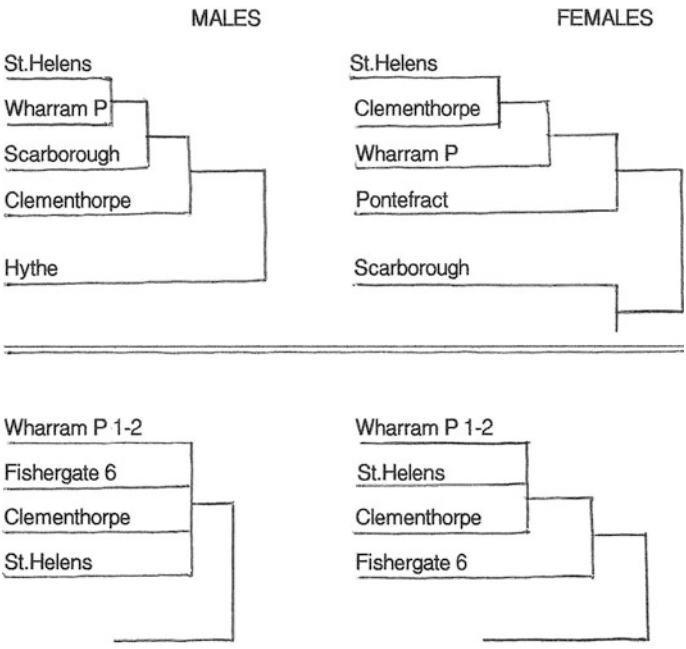

Fig. 6.3 Part of the cluster analysis undertaken for the St. Helen's study (Dawes and Magilton 1980) and similarly for the Wharram Percy analysis (Mays 2007). The sites represent medieval Yorkshire except for Hythe. Note the changing sequences between the males and females

suggestive but far from proven. With the development of ancient molecular studies, it is possible that these potential family groups may reveal DNA evidence that supports this. Meanwhile, some interesting but limited results have been obtained on early British populations.

Saunders (1989) and Tyrrell (2000) have provided much needed critical reviews of the use of non-metric traits. Detailed lists of osseous cranial traits are shown in association with types of anatomical structures (vascular, neural sutural, ontogenetic or functional). There are other factors, such as the influence of age and sex on frequencies. And what is the significance of the bilateral and unilateral occurrence of traits? But whatever the basic methodological problems, we are in need of far more data for early British populations, if we are ever to evaluate what traits might have discriminatory value. And the sample sizes need to be far larger than were deemed sufficient in some of the earlier studies.

Berry (1975) studied a series of London skulls, mainly dated between 1800 and 1859. Coffin details provided information on sex and age, and a note was kept of any family links, as well as rickets and spina bifida occulta. She concluded that some incidences varied between the sexes, but this was not consistent. Age and other variables seemed to have negligible influence. A further study (Berry 1974) employed non-metric traits to evaluate Scandinavian population movements in the past. Six early British samples, mainly from areas of possible Scandinavian

influence were included, and the results generally supported the view that closer affinities occurred where the British sample could have been influenced by earlier Scandinavian settlement. Of course, not all variants are equally discriminating for the early British populations. For instance, from Neolithic times to the post-medieval period, metopism fluctuates relatively little, while epipteric bones seem to decline, and lambdoid wormians fluctuate markedly (Brothwell 1965).

While non-metric traits continue to be used in zoology, especially to evaluate biological distances in samples of small mammals, criticisms in relation to human populations need to be considered, and if possible answered. In the case of external auditory exostoses, there is now a good case for believing that a number of environmental factors can stimulate the growth of these conditions (Hutchinson et al. 1997). Methodology is also in urgent need of review, and perhaps in particular inter-observer error, which I suspect is significant for some traits. Also, heritability needs to be viewed critically, because similarity in environment may result in a pseudo-genetic correlation.

What has been said for the skull applies equally to non-metric traits of the post-cranial skeleton (Finnegan 1978; Anderson 1987). There are fewer in number, but their aetiology urgently needs further consideration. Some traits of the vertebral column are probably congenital, but what of so-called squatting facets? If the distal hyperextensibility of the last digit of the thumb is inborn, why not this trait on the tibia? Stress to a joint margin is more likely to produce an arthritic stress reaction, rather than normal joint surface remodelling. It also seems likely that Allen's fossa and plaque on the femur should be separated as stress pathology and not recorded as simple traits.

Pathology

There is very considerable literature on the health of early British people, and much is reviewed by Roberts and Cox (2003) and Roberts and Manchester (1997). Many cemetery reports include a pathology section. My special concern here is therefore to call attention to aspects that are controversial or have been somewhat neglected.

In terms of congenital abnormality, only one certain case of Down's Syndrome is known (Brothwell 1960a, b). There is a Neolithic case of club foot and later examples (Brothwell 1973), a Roman hydrocephalic and others (Trevor 1950), a Saxon child with cleft palate (Brothwell 1981), a Roman case of mesomelic dwarfism (Rogers 1986), and cases of congenital dysplasia of the hip. Unfortunately, congenital deformity in very young children was likely to result in a 50 % increase in mortality and be obscured by post-mortem burial conditions.

Metabolic, endocrine and environmental conditions are most likely to be found in children or old age groups. Nutritional 'stress' can result in critical vitamin deficiencies. Rickets and osteomalacia appear to be absent until Roman times. Most cases are from the post-medieval period though the low figure for the medieval period needs revising. A greater antiquity is seen for scurvy that

probably affects at least two Bronze Age children, and there may be another half dozen medieval cases. By post-medieval times, it is likely that scurvy prevalence varied in urban and rural groups, with a range of 0.1–1.0 %.

Bone changes that may indicate anaemia are mainly in the form of cribra orbitalia or vault porotic hyperostosis. Orbital cribra in particular has been reported at various British sites and periods, with a prevalence of 7–19 %. However, children are most affected, and at Roman Poundbury (Stuart-Macadam 1991), 56.8 % of under 10 year olds were affected (with 23.1 % vault osteoporosis), but only 26 % of adults had cribra (and only 5.7 % had vault lesions). The evaluation of Harris lines is more problematic, as they can be lost in adult years. But, the 37 % presence of one or more lines at medieval Wharram Percy in juveniles suggests that it can be a useful stress indicator for some age groups (Mays 1995).

The impact of many forms of trauma begins at birth, and skeletal examples are numerous and spread through time (Roberts 1989, 1991). However, perimortal damage is not easy to identify. In large samples of individuals, cranial injuries are less than 1.0 %. Comparing Roman and medieval samples, there is an increase (0.4–1.4 %) in humerus fractures, but no change in ulna, radius, femur and tibia percentages while fibula trauma declines.

Although the diagnosis of at least the majority of diseases of the teeth and mouth is straightforward, the reasons for the variation present a more complex problem. Sample sizes are often too small to allow divisions into age groups and the sexes. Interest in British oral pathology extends back into Victorian times. Mummery (1869) examined British archaeological material, as well as a range of other population samples. Sir Frank Colyer was also interested in oral history and examined large samples of seventeenth–eighteenth-century Londoners (Colyer and Sprawson 1942). Reviews of aspects of British oral pathology have appeared over the past half century (Brothwell 1959; Moore and Corbett 1971, 1973; Roberts and Cox 2003). Oral pathology of the past is not simply to provide a historic record for the dental profession, but because it reflects on the hygiene and dietary habits of earlier groups. Congenital absence of teeth, defective formation during childhood growth, dietary differences between the commoner and the elite factions of society, religious isolates, can all contribute to the variation. The problem is that it is easier said than analysed.

A number of reviews of tumours and their tentative identification have been made in recent years (Ortner 2003; Brothwell 2008, 2012; Waldron 2009). The main problem is to discriminate between benign and the more destructive malignant forms. The extent to which a tumour can be given a more specific name, for instance osteoma, osteochondroma, osteosarcoma, is likely to depend on how ‘classic’ the bone changes are and how well preserved the bone is. The finer points of naming are not as important as identifying the bones changes as possibly a benign or malignant neoplasm. In modern populations, tumours are most common in older age groups, especially after 50 years. By this age, the majority of individuals in earlier British populations would have been dead and buried. Nevertheless, a number of cases have been described from various British sites. The most common form, which has been noted in skeletal series from a variety of sites, is the benign osteoma. It occurs in material from prehistory to recent times

and is in the form of shallow rounded mounds of dense cortical bone. Usually, it appears on the skull, especially the frontal bone. Although generally accepted as a benign tumour, I confess to having some reservations, especially as minor trauma to the head (especially accidental bumps) are common. In other words, could some cases in fact be small ossified haematomas?

Early British skeletal series have provided well over fifty examples of tumour-affecting bone. In all, the benign tumour cases range from Neolithic to post-medieval times. The malignant cases range from Bronze Age to medieval and beyond in date. Overall, the limited sample size does not allow any speculation as regards temporal or regional differences. The fact that most cases are post-Iron Age in date is simply a reflection on the scarcity of skeletal material prior to the Roman period. Further details of these cases are given in the detailed review by Roberts and Cox (2003), as well as a shorter malignant tumour review by Strouhal (1998).

Infectious disease is one of the most difficult categories of palaeopathology, as infections may result in bone changes that are not characteristic of a specific disease. The three conditions that can leave fairly distinctive changes to bones are tuberculosis, leprosy and treponematosis. The antiquity of tuberculosis in Britain is uncertain, but is present in Roman groups (Roberts 2002; Roberts and Buikstra 2003). Medieval mycobacterial DNA has now been identified in London skeletal material (Taylor et al. 1996). The other mycobacterial condition, leprosy, was probably established in Romano-British times and was a major health problem by the medieval period (Roberts and Cox 2003; Manchester and Roberts 1989). What is not yet appreciated is that it probably entered Britain in a pincer movement, first in the south but followed by infected Vikings into Orkney and perhaps with Danes invading the English east coast. The treponematoses probably entered Britain initially as endemic syphilis, linked to the Crusades or the expansion of the Ottoman Empire into Europe. I have argued elsewhere that it was transformed into an aggressive venereal form by entering a very different social and biological environment (Brothwell 2005). Treponema pallidum DNA has been identified in 200-year-old bones, but not as yet from Britain (Kolman et al. 1999). To me, one of the most neglected aspects of infectious disease is presented by the common occurrence of long-bone periostitis, especially of the tibia and fibula. While it may have multiple causes, it seems to me highly possible that the main culprit could be typhoid fever, with bone changes known to favour the lower leg. Similarly, we have failed so far to identify potential cases of smallpox osteitis (Middlemiss 1961).

A considerable literature has developed on joint disease in early British populations, especially as a result of research in Bristol (Rogers 1984; Rogers et al. 1987; Rogers and Waldron 1995) and in London (Waldron 1991a, b, 1996). Their work in particular has helped to clarify the differences in joint diseases and to provide evidence for them and some statistical contrasts. The most prevalent condition is osteoarthritis, which involves many older adults. Males and females can show differences in the pattern of spinal osteoarthritis. DISH may well have obesity and type II diabetes associations, being especially associated with a sheltered and well fed monastic life. Joint disease, especially spinal, resulting from brucellosis, has been neglected, but diagnosis remains problematic (Mays 2007).

Growth retardation or atrophy of limbs or parts of limbs can be the result of trauma, infection or genetic factors. The abnormality usually contrasts visibly with the normal unaffected limb. A number of these conditions have been considered to be evidence of poliomyelitis, a major disease in the past (Cave 1938; Wells 1982; Stead 1991; Stroud 1987; Chundun and Roberts 1995; Powell 1996; Brothwell and Browne 1994). It could be that in some of these cases, poliomyelitis was the initial cause, but trauma is an alternative explanation in one or two cases, while in another, it was argued that the cause may not have been poliomyelitis but a Duchenne type of muscular dystrophy (Brothwell and Browne 2002). Clearly, there is again a need to consider a differential diagnosis of such cases very carefully.

'Ethics' Versus Destruction

Even in relaxed liberal Britain, there are many points of view about what to do with ancient human remains (Brothwell 1962). Some wish them to be reburied without biological study, and there are differences of opinion between England, Scotland and Northern Ireland. The current legislation in relation to the excavation and treatment of human remains in Britain is well discussed by the late Bill White (2011) and deserves no further debate here. At present, there is no national plan to archive samples for future DNA studies, or curate X-rays/CT scans. Ideally, a cast should be made of any special pathology to be reburied, but it is not. In other words, the situation remains unsatisfactory.

Final Comments

A considerable mass of biological information on the early British has been collected over a century and more, and the data have become much more broader. For instance, children are receiving far more research attention than they did half a century ago (Lewis 2007). The most important development, however, is the growing interest in linking our increasing knowledge of DNA variation in living Britons with their archaeological past (Weale et al. 2002; Sykes 2006; Oppenheimer 2006). This will transform our knowledge of the ancient British in the next few decades.

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Chapter 7
Bioarchaeology in Canada: Origins and Contemporary Issues

Jerome S. Cybulski and M. Anne Katzenberg

The Origins of "Bioarchaeology" in Canada

Bioarchaeology in Canada has its roots in physical anthropology, a discipline whose intellectual history in the country can be traced to the middle of the nineteenth century (Melbye and Meiklejohn 1992; Popham 1950). It was not until much later and mainly during the 1960s, however, that the study of human skeletal remains from archaeological sites truly began a sustained scholarly journey to its modern emphasis on biological distance analysis, palaeodemography, palaeopathology, palaeodietary studies, and, most recently, ancient DNA research, all within the context of archaeological (i.e. social, cultural, and environmental) theory.

Initially and throughout its formative years, two institutions were largely responsible for the development of physical anthropology and bioarchaeology, the University of Toronto (Sawchuk and Pfeiffer 2001), and the National Museum of Canada (now the Canadian Museum of Civilization), both situated in central Canada. They continue their prominence today, but bioarchaeology is now researched and taught at many institutions of higher learning across the whole of the country—from Memorial University in St. Johns, Newfoundland on the east coast to the University of Victoria in British Columbia on the west, a driving distance of 7,000 km. In addition to the study of ancient aboriginal remains (Indian or First Nations and Inuit), an initial and subsequent mainstay of bioarchaeology in

This chapter is dedicated to the memory of Dr. Shelley Rae Saunders (1950–2008), who was originally invited to speak about Canadian Bioarchaeology at the 2008 SAA symposium in Vancouver and contributed to the information presented here.

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Canada, researchers have addressed historical and theoretical issues involving study of the remains of early European settlers and military personnel in Canada, nineteenth century townsfolk, and Arctic explorers. Today, Canadian researchers contribute their expertise and exchange interests throughout the world.

The Early Years (1848–1958)

During the first approximately 100 years of physical anthropology in Canada, there were few published works, no developing academic programs, and certainly no student legacy. Yet, there were some key developments, if not necessarily milestones, that likely had some influence on the significant 1960s.

The early practitioners of physical anthropology in Canada were mainly natives of England and Scotland and received their educations there. Their backgrounds were largely in medicine. Popham (1950: 175) writes that the earliest contribution was a work on the physical characteristics of the Inuit (then known as Eskimo or Esquimaux) by King (1848) in which he also remarked upon skulls. Dr. Richard King (1810–1876) was a British obstetrician and explorer who appears to have made one trip to the Canadian Arctic where he observed his living subjects first hand (Wallace 1987).

Sir Daniel Wilson (1816–1892), born in Scotland, is another pioneer. He emigrated to Canada and was well versed in archaeology before he left his native land (Meiklejohn 1997). He took up a chair in History and English Literature at the University of Toronto and eventually became its president. Wilson's contributions to human osteology were principally in cranial studies and theory. He published a treatise on the skulls of Huron Indians, an Iroquoian group in the province of Ontario (Wilson 1871), and became known in North American anthropological circles for his critical stance on Samuel Morton's approach to cranial types and the races of man. Most notably, Wilson questioned Morton's supposition that American Indian crania lacked diversity (Stewart and Newman 1951).

Susanna Boyle (1869–1947) has been promoted as Canada's first female physical anthropologist (Cook and Horne 2006). She was born in Ontario to David Boyle (1842–1911), a Scottish immigrant who became curator of the Canadian Institute Museum and later the Ontario Provincial Museum, forerunner of the Royal Ontario Museum in Toronto. David Boyle published on archaeological sites in Ontario and built up human skeletal collections, while his daughter, a medical doctor, wrote up the human remains as appendices to his reports (Anderson 1962a; Boyle 1892).

The German–American anthropologist, Franz Boas (1858–1942), studied the physical anthropology of the native peoples of the Pacific Northwest in the 1890s. Most of those observations came from Canada's west coast and interior plateau. His collections on behalf of the Jessup North Pacific Expedition of the American Museum of Natural History led to publications on craniology (Oetteking 1930),

intentional head shape modification for which native Northwest Coast people are historically well known (Boas 1889, 1891: 647–655; Cybulski 1975a), and occasional references to pathological specimens (Boas 1890: 811). The American anthropologist George Amos Dorsey (1868–1931) also published on the skeletal remains of Canada's west coast Indians based on collections he and others made for the Field Columbian Museum (Field Museum of Natural History) in Chicago (Dorsey 1897a, b, c).

In the first decades of the twentieth century, the Federal Government of Canada funded a major scientific expedition to the Arctic under the direction of the Canadian explorer and ethnologist Vilhjálmur Stefánsson (1879–1962). The physical anthropology of the Inuit formed a significant part of the survey under the supervision of the ethnologist Diamond Jenness (1923) whose assignment was encouraged by the National Museum of Canada (Hancock 1999: 44–46). Dr. John Cameron (1873–1960), a professor of anatomy at Dalhousie University in Halifax (1915–1930), was responsible for the project's study of human skeletal remains (Cameron 1923).

The National Museum of Canada played a leading role in the early years of human skeletal studies. Sir Francis Howe Seymour Knowles (1886–1953), a native of England, was hired in 1914 as the National Museum's first physical anthropologist. He served only until 1919, when he returned to his home country due to ill health, but in those brief years studied living aboriginal people in Ontario as well as skeletal remains from archaeological sites. In addition to other works (Knowles 1915, 1916), a principal contribution was a comprehensive report on the "Roebuck Iroquois", a collection of 84 human skeletons and assorted scattered remains found at a 500-year-old village site south of Ottawa, Ontario, near the St. Lawrence River (Knowles 1937). It may be considered as the first osteological site report in Canada with archaeological and anthropological context. Knowles' monograph included demographic reconstruction, postcranial and cranial measurements, qualitative variables of continuous morphology, a few non-metric discontinuous traits, and skeletal and dental pathology, and drew specific comparisons with neighbouring skeletal samples from Ontario and New York State.

Other museum staff also contributed to the study of human remains, albeit on a smaller scale. They included Harlan Ingersoll Smith (1872–1940), an American archaeologist who formerly worked with Boas and the Jessup Expedition, and John Douglas Leechman (1890–1980), a native of England who was educated in London, Egypt, and Switzerland before coming to Canada as a youth (Dyck 1998). Both wrote on trephination in Northwest Coast aboriginal skulls (Smith 1924; Leechman 1944; see also Cybulski 1980, 2006: 538–539; Stewart 1958: 476–477), and Leechman (1934) described dental caries in the National Museum's skeletal collections. Two practicing west coast physicians with an interest in anthropology, George Edward Kidd (1883–1948) and George Elias Darby (1889–1962), reported on teeth in archaeological skulls from the collections of the Vancouver City Museum in British Columbia (now the Museum of Vancouver) (Kidd and Darby 1933). Kidd also reported on apparent trepanation, osteoarthritis, and examples of artificial cranial deformation in those collections (Kidd 1930, 1946).

At the University of Toronto, a Canadian born professor of orthopaedics, Robert Inkerman Harris (1889–1966), published on the skeletal pathology of ancient aboriginal ossuaries in Ontario (Harris 1949; Kidd 1954). Perhaps the most influential historical figure on what would later become bioarchaeology in Canada was Dr. John Charles Boileau Grant (1886–1973), an anatomist and teacher *par excellence* (Tobias 1992). Born in Scotland where he obtained his medical degree, he first taught in Canada at the University of Manitoba and then at the University of Toronto as Professor and Head of the anatomy department between 1930 and 1956. He became world renown for producing three textbooks of anatomy that bear his name. One, *Grant's Atlas of Anatomy,* was first published in 1943 and is currently in its twelfth edition (Agur and Dalley 2009).

It has been said that Grant was a physical anthropologist in all but name (Jerkic 2001). During his teaching in Manitoba, he conducted research on the anthropometry of six different Canadian First Nations groups, all studies of which were published by the National Museum of Canada (Grant 1929, 1930, 1936). He also published on an Eskimo skeleton in the *American Journal of Physical Anthropology* (Grant 1922) and incorporated illustrations and frequency data on "skeletal variations and anomalies" (i.e. discrete traits) in his textbooks. Besides those books and his worldwide recognition, J.C.B. Grant left two lasting legacies. One was a research collection of the skeletal remains of 202 individuals of known age at death, sex, and cause of death acquired for the University of Toronto between 1928 and the 1950s (e.g. Bedford et al. 1993; Kurki 2005), and the other was a student by the name of James E. Anderson.

The 1960s and 1970s

Bioarchaeology as we know it today really began in Canada in the 1960s, following a path simultaneously underway in the USA (e.g. Buikstra and Beck 2006). First and foremost in its promotion was Dr. James Edward Anderson (1926–1995), Grant's student, who, unlike any of his historical predecessors in physical anthropology in Canada, became active internationally and left graduate students immersed in the discipline who, with their doctorates in hand, would reproduce others to carry on into the twenty-first century. He has been called the "father of Canadian skeletal biology" (Ellis et al. 2010: 2).

Dr. Anderson was a native-born Canadian who received a medical degree from the University of Toronto in 1953 and began teaching in the anatomy department in 1956. He also taught human osteology to pre-medical students in the anthropology department where he connected with Professor J. Norman Emerson (1917–1978), a faculty archaeologist who carried out local excavations and field schools in which Anderson became involved. Anderson was hired to the department's faculty in 1958 and became full professor in 1961, the first full-time teaching physical anthropologist in the country.

Anderson was a tireless champion of human skeletal studies in archaeology, a superior teacher, and an active researcher who gained international influence. Initially, he produced a series of publications on locally excavated skeletal remains and collections that detailed all aspects of skeletal studies then known, essentially taking Sir Francis Knowles' Roebuck Iroquois site report to the next level. The Ontario sites Anderson first studied and published included Bosomworth, Fairty, and Serpent Mounds (Anderson 1962b, 1964, 1968a). He combined his talents with Dr. James V. Wright (1932–2004), Ontario staff archaeologist at the National Museum of Canada, to produce reports on the Donaldson and Bennett sites in Ontario, assisting in the excavations and taking responsibility for the human osteology (Wright and Anderson 1963, 1969). Elsewhere in Canada he worked closely with Memorial University archaeologist Dr. James A. Tuck to produce comprehensive osteological studies on a Maritime Archaic period cemetery in Newfoundland (Anderson 1976) and on remains of the later Dorset Palaeoeskimos (Anderson and Tuck 1974). Also noteworthy was his collaboration with Canadian archaeologists James F. Pendergast (1921–2000) and Bruce G. Trigger (1937–2006) on the study of Montreal's Dawson site, speculatively identified as the Iroquoian village of Hochelaga visited by Jacques Cartier, the sixteenth century explorer who claimed Canada for France (Anderson 1972).

Anderson's international connections stemmed in part from a 3-year professorship (1963–1966) in the anthropology department of the State University of New York at Buffalo. While there teaching full time, he studied and wrote up the series of ancient human skeletons excavated in the Tehuacán Valley under the direction of Richard S. MacNeish (1918–2001), including an article in the journal *Science* (Anderson 1965, 1967). The series included the then oldest known group of skeletons in the Americas, 6500–5000 BC. Later, at the behest of the archaeologist Fred Wendorf at Southern Methodist University, he studied and reported on the skeletal remains of over 50 individuals from two Late Palaeolithic sites in Nubia, detailing vital statistics, metric and non-metric morphology, dental pathology, tooth wear, and skeletal pathology, and comparing the remains to others from Egypt, the Sudan, Northwest Africa and East Africa (Anderson 1968b).

Dr. Anderson was expert in the areas of palaeopathology and non-metric skeletal morphology and related theory. With the Tehuacán analysis, he identified patterns of change in dental pathology from the earliest to the latest skeletons that corresponded to cultural changes in subsistence (Anderson 1965). He served as a discussant in the landmark symposium on palaeopathology organized by Saul Jarcho and held in Washington, D.C. in 1965 to "reanimate" palaeopathology in the USA (Anderson 1966; Jarcho 1966). Anderson also identified changes in the frequencies of certain non-metric morphological variants (he dubbed them "anomalies") which likely reflected genetic variation through time in the Middle Woodland, Late Woodland, and prehistoric Iroquois populations of Ontario (Anderson 1968a). He expanded this thesis in an invited contribution to Don R. Brothwell's book, *The Skeletal Biology of Earlier Human Populations,* which became required reading in many university bioarchaeology courses and remains so today (Anderson 1968c).

James Anderson returned to the anthropology department of the University of Toronto in 1966, bringing five graduate students with him from the University of Buffalo. He also took on others already there who had been orphaned by the untimely death of their mentor, Dr. Lawrence Oschinsky (1921–1965). Oschinsky, a native New Yorker, was hired by the department in 1963 when Anderson had left for Buffalo, following a 5-year staff position as Curator of Physical Anthropology at the National Museum of Canada (Swindler 1967). Well grounded and published in racial variation and evolutionary theory (Gaherty et al. 1969), he also left a lasting contribution for future skeletal biologists with his book, *The Most Ancient Eskimo* (Oschinsky 1964). It remains a master work on the cranial morphology of the Eskimo (Inuit) with special reference to the identification of Dorset skeletal remains in the eastern Canadian Arctic based on research he had conducted at the National Museum (see also Ossenberg 2001).

Anderson's return stay in Toronto was brief as he had already accepted a position in the medical school of McMaster University in Hamilton, Ontario, in 1967 which became full time in 1969. Effectively replacing him was Dr. David Rees Hughes (1926–2008) who had earlier worked as the National Museum of Canada's third physical anthropologist (1965–1967). While mainly involved with the International Biological Programme in Human Adaptability in the Canadian Arctic (Milan 1980), Hughes had also contributed to Brothwell's *The Skeletal Biology of Earlier Human Populations* and published on human remains from eastern Canada which he studied at the museum (Hughes 1968, 1969a, b). He also took to completion three of Anderson's Ph.D. candidates who went on to teach bioarchaeology in Canadian universities—Christopher Meiklejohn, Sonia Jerkic, and Patrick Hartney (1939–1980). In Canada, Anderson was responsible for the doctorates of four people in skeletal biology, three of whom continued bioarchaeology careers at Canadian institutions—Nancy S. Ossenberg, F. Jerome (Jerry) Melbye, and Jerome S. Cybulski. Robert I. Sundick went on to spread the word of James Anderson in the USA. Michael Pietrusewsky, who had come up with Anderson from Buffalo, studied with him at Toronto but was awarded his doctorate under Visiting Professor Dr. Bin Yamaguchi. Another of Canada's Anderson descendants was Michael W. Spence who gained BA and MA degrees under Anderson's and J. Norman Emerson's guidance at the University of Toronto (1959–1964) but went on to his Ph.D. at Southern Illinois University in the USA.

The 1970s introduced stability, academic expansion, and sustained growth to bioarchaeology in Canada. What would ultimately become long-term supporting research and (or) educational opportunity programs were instituted at Memorial University of Newfoundland (Dr. Sonja Jerkic), the National Museum of Canada (Dr. Jerome S. Cybulski), the University of Toronto (Dr. Jerry Melbye), Queen's University in Kingston, Ontario (Dr. Nancy S. Ossenberg), the University of Western Ontario (Dr. Michael W. Spence), the University of Winnipeg (Dr. Christopher Meiklejohn), and the University of Saskatchewan (Dr. Patrick C. Hartney [1939–1980]). Outsiders (mainly American-trained) or Canadians who

received their degrees elsewhere came to initiate human skeletal studies at the University of Manitoba (Dr. William D. Wade [1938–2012]), the University of Calgary (Dr. Charles E. Eyman [1933–1990]), the University of Alberta (Dr. D. Gentry Steele), Simon Fraser University (Dr. Thomas W. McKern [1920–1974]; Dr. Mark F. Skinner), the University of British Columbia (Dr. Braxton M. Alfred), and the University of Victoria (Dr. Roberta L. Hall).

Contemporary Issues

Academics

Today, there is a strong nationwide graduate teaching presence in bioarchaeology. Doctorates in physical anthropology with emphases in bioarchaeology are currently offered at the University of Toronto (Dr. Susan K. Pfeiffer, Dr. Michael A. Schillaci), the University of Montreal (Dr. Michelle Drapeau), McMaster University (Dr. Megan Brickley, Dr. Hendrik Poinar, Dr. Tracy L. Prowse), the University of Western Ontario (Dr. Andrew Nelson, Dr. Christine D. White, Dr. J. Eldon Molto), the University of Manitoba (Dr. Robert D. Hoppa), the University of Calgary (Dr. M. Anne Katzenberg), the University of Alberta (Dr. Nancy C. Lovell, Dr. Sandra J. Garvie-Lok), and Simon Fraser University (Dr. Mark F. Skinner, Dr. Dongya Yang, Dr. Mark Collard). The following institutions offer Master's degrees: Memorial University of Newfoundland (Dr. Sonja M. Jerkic, Dr. Vaughan Grimes), Trent University in Ontario (Dr. Anne Keenleyside and Dr. Jocelyn Williams), the University of British Columbia in Vancouver (Dr. Brian S. Chisholm, Dr. Michael P. Richards, Dr. Darlene A. Weston), the University of Northern British Columbia (Dr. Richard Lazenby), and the University of Victoria in British Columbia (Dr. Helen Kurki). Faculty in physical anthropology (aka bioanthropology) at three of the schools are in Departments of Archaeology, highlighting the symbiotic relationship between human skeletal studies and archaeology.

In 2000, the Government of Canada instituted countrywide recognition of excellence in university faculty research with its Canada Research Chairs program. It crosses all disciplines and generously supports faculty salaries and research funding for periods of seven or 5 years (Tier 1 and Tier 2, respectively). Recipients include the top echelon of teaching scientists. Dr. Shelley R. Saunders who taught in the anthropology department of McMaster University from 1981 to 2008 was the first recipient in bioarchaeology for studies in Human Disease and Population Relationships. Current holders include Dr. Christine D. White, University of Western Ontario, for research in bioarchaeology and isotopic anthropology, and Dr. Robert D. Hoppa, University of Manitoba, for research in skeletal biology. Of more than passing interest is that Dr. Saunders and Dr. White received their doctorates under the supervision of Dr. Jerry Melbye at the University of Toronto

and that Dr. Hoppa's doctorate was supervised by Dr. Saunders, all attesting to the quality of the scholarly gene pool initiated by Dr. James E. Anderson. A third current Canada Research Chair is Dr. Megan Brickley, a native of the UK who recently joined the faculty of McMaster University, for her research in the bioarchaeology of disease. Although not technically awarded in bioarchaeology, Dr. Mark Collard in the Department of Archaeology at Simon Fraser University holds a Canada Research Chair in a closely related field, Human Evolutionary Studies. His research portfolio includes the estimation of body mass, stature, and age from skeletal material.

On the federal level as well, the Canadian Museum of Civilization (formerly the National Museum of Canada, National Museum of Man) continues to support physical anthropological research either in-house or through external contracts and has maintained its long-standing publication program, begun with the work of Sir Francis Knowles. Since 1972, publications on human skeletal remains have been part of its monographic Mercury Series (e.g. Cybulski 1975a; Pfeiffer 1977; Saunders 1978; Merbs 1983; Molto 1983; Katzenberg 1984; Patterson 1984; Williamson and Pfeiffer 2003). As in the case of some university departments, as noted above, the Curator of Physical Anthropology and Physical Anthropology Programme are part of the museum's Archaeology and History Division, and formerly, the Archaeological Survey of Canada.

Ethics and Repatriation

Ethics and public perception in the study of human skeletal remains are current issues worldwide.[1] In Canada, the concern was already evident in the 1960s but very soon formally addressed by the Canadian Association for Physical Anthropology (CAPA). CAPA which, like the AAPA, or American Association of Physical Anthropologists in the USA, includes all subareas of physical anthropology was conceived in 1972 and held its first annual meeting in Banff, Alberta, in 1973. One of its first orders of business was to strike a committee to address the issue of proper procedure and public concern in the study of archaeological human remains. The result was a published set of guidelines on the excavation, treatment, analysis, and disposition of human skeletal remains from archaeological sites in Canada (Cybulski et al. 1979). Most importantly, the association encouraged understanding and cooperation on the part of archaeologists and physical anthropologists with First Nations and potential descendants from other groups in local community settings.

Members of CAPA had been exposed to cooperative and collaborative ventures with First Nations early in their graduate and professional careers. Shelley

[1] For more on the Canadian approach to these issues and how it contrasts with that of the USA, see Buikstra (2006, especially pp. 408–412).

Saunders worked on burial and skeletal material with the Ojibway Beausoleil Band on Christian Island in Georgian Bay, Ontario, late in the 1960s and early 1970s (Saunders et al. 1974). Jerome Cybulski, as a Master's level student at the University of Buffalo in 1965–1966, was fortunate to learn osteology within a cooperative field setting in south-western New York State measuring the bones of Seneca Indian ancestors who were being moved from soon to be flooded cemeteries near the banks of the Allegheny River (Lane and Sublett 1972; Saunders 2006: 191–193). This was one of many dam construction projects in the 1960s undertaken by the U.S. Army Corp of Engineers that impacted Native American burial grounds in the USA (see, for example, Sprague 2005). After completing his studies at the University of Toronto, Cybulski continued working with First Nations communities, first on burial recovery and in situ osteology at Hesquiat Harbour on the west coast of Vancouver Island (Cybulski 1978) and then at Owikeno Lake on the central mainland coast of British Columbia with the Oweekeno/Wuikinuxv Nation (Cybulski 1975b). Additional field and laboratory studies followed (Cybulski 1992; Cybulski et al. 2007).

Others, as well, have carried out cooperative First Nations projects involving bioarchaeology in Canada. In 1999, Kevin Brownlee and Leigh Syms (1999) published their *Kayasochi Kikawenow, Our Mother from Long Ago,* excavated from an eroding lakeshore in northern Manitoba and studied with the participation of the local Cree community. The following year saw publication by Owen Beattie and co-workers of the first research results on Canada's very own "iceman", Kwäday Dän Ts'inchii, a successful analytical and reburial collaboration among the British Columbia Archaeology Branch, the Royal British Columbia Museum, the University of British Columbia and the Champagne and Aishihik First Nations (Beattie et al. 2000). In 2003, Williamson and Pfeiffer (2003), the latter one of Jerry Melbye's doctoral recipients, published their *Bones of the Ancestors: The Archaeology and Osteobiography of the Moatfield Ossuary,* a project undertaken in collaboration with the Six Nations Council of the Grand River in Ontario.

While on-site or in situ osteology has provided a successful working compromise for continued studies in bioarchaeology, especially with respect to the remains of First Nations ancestors, it has not necessarily curtailed reburial or repatriation of existing collections. The premier Roebuck Iroquois skeletal collection studied by Knowles (1937) was repatriated by the Canadian Museum of Civilization to the Mohawk Nation Council of Chiefs in 1998. It had been held by the National Museum of Canada since it was excavated in 1912 and 1915 by William J. Wintemberg (1876–1941), one of the museum's first practicing archaeologists (Jenness 1941). Notwithstanding Knowles' excellent monograph, Janet Young, Physical Anthropology Researcher for the museum, undertook a comprehensive modern re-investigation of the skeletal remains prior to their departure as is the museum's current standard practice. All her data and a comprehensive photographic record are on file in the museum's Archives (see also Young 2004). Mention must also be made of a large series of Archaic period human remains that were held by the museum for 44 years following their

excavation in the Upper Ottawa Valley. Pfeiffer (1977) studied most of this material for her doctoral research at the University of Toronto. The remains were repatriated in 2005 but, again, not without first being documented in their entirety by Young (2009).

Canada does not have comprehensive federal legislation governing the excavation, research, or curation of indigenous archaeological human remains as is the case with NAGPRA in the USA. However, statutes, rules, regulations, and (or) guiding principles are separately provided by each of the country's ten provinces and three territories for archaeological work in their jurisdictions, including the excavation of human remains. Additionally, a 1992 Task Force Report on Museums and First Peoples co-sponsored by the Canadian Museums Association and Assembly of First Nations provides for a collaborative working relationship between indigenous people and museum professionals (Canadian Museums Association 1992). Further details and discussion of ethics and policies in the archaeological excavation and study of human remains in Canada may be found in Cybulski (2011).

Research

James E. Anderson's 1960s research and publications set the stage for work by his students and their students over the next several decades and into the twenty-first century. Summaries with comprehensive bibliographies for the studies of aboriginal remains can be found in contributions prepared for the *Handbook of North American Indians: Environment, Origins and Populations* (edited by Ubelaker 2006) by Cybulski (2006) for British Columbia and the Pacific Northwest, Katzenberg (2006a) for Ontario and the Great Lakes, and Keenleyside (2006) for the Arctic and Subarctic. Issues concerning European contact and aboriginal populations, where more bibliographic references can be found, have received treatment from a bioarchaeological standpoint by Saunders, Ramsden and Herring (1992), Cybulski (1994), and Pfeiffer and Fairgrieve (1994).

While much has been written about the ancestors in Canada of modern day First Nations and Inuit (see, for example, Merbs 1983, 2002, for more of the latter), the remains of early European settlers and military personnel in Canada, nineteenth century townsfolk, and Arctic explorers have not been ignored. An opportunity to excavate and study the remains of mid-eighteenth century colonial and British prisoners of war arose when Parks Canada archaeologists were assigned to monitor repair of the fortification walls of historic Quebec City in the 1980s (Cybulski 1988; Piedalue and Cybulski 1997). Dr. Owen Beattie (University of Alberta) and Dr. Anne Keenleyside (Trent University) discovered or assisted with the discovery of the skeletal remains of members of the ill-fated Sir John Franklin expedition to the Canadian Arctic (1845) and studied them for signs of scurvy and cannibalism,

finding as well high levels of lead in the bones (Beattie 1983, 1985; Keenleyside et al. 1997, 1996, 1989; Kowal et al. 1991). Bioarchaeological study of a cemetery for the War of 1812, discovered in Fort Erie, Ontario provided insight into trauma, disease, and place of origin of the soldiers buried there (Pfeiffer and Williamson 1991). Studies of other nineteenth century remains of EuroCanadian origin have included a Methodist cemetery in Ontario (Pfeiffer, Dudar and Austin 1989), a family plot in Ontario (Saunders and Lazenby 1991), and the St. Thomas Anglican cemetery in Belleville, Ontario. The latter has resulted in numerous publications of great benefit to methodology in bioarchaeology because of an associated complete set of burial records (e.g. Rogers and Saunders 1994; Saunders 2008; Saunders et al. 1992, 1995, 2002). Saunders and Ann Herring (1995) brought together an international group of scholars who were studying historic cemeteries, resulting in the edited volume, *Grave Reflections: Portraying the Past through Cemetery Studies*.

Henry Schwarcz, an isotope geochemist at McMaster University, recognized the promise of stable isotope analysis for resolving questions about past diet including coastal adaptations and the introduction of agriculture. Through his training and collaboration with Erle Nelson (Simon Fraser University), Brian Chisholm (University of British Columbia), Anne Katzenberg (University of Calgary), Christine White (University of Western Ontario), and Tracy Prowse (McMaster University), Canada has made significant contributions to the development of this field. Stable isotope studies of diet and methodological caveats have been carried out for prehistoric populations in British Columbia (Chisholm et al. 1982, 1983; Cybulski 2010; Lovell et al. 1986), and Ontario (Schwarcz et al. 1985; Katzenberg et al. 1995; Katzenberg 1989, 1992, 2006b; Harrison and Katzenberg 2003). Research on dietary adaptations in the Canadian Arctic has been carried out by U.S. researchers (Coltrain 2009; Coltrain Hayes and O'Rourke 2004).

Ancient DNA studies have successfully been carried out on 5,000-year-old skeletons from two archaeological sites in the interior of British Columbia, revealing the identification of a new aboriginal haplogroup (M*) at one of them (Cybulski et al. 2007; Malhi et al. 2007). Molecular studies have also detected the *Mycobacterium tuberculosis* in the Uxbridge ossuary sample of Ontario (Braun et al. 1998). Ancient DNA laboratories have been established in several Canadian universities. Shelley Saunders and colleagues established a laboratory at McMaster University which is now directed by Canada Research Chair, Hendrick Poinar. Dongya Yang, who received his Ph.D. from McMaster, now directs the ancient DNA laboratory at Simon Fraser University.

Canadian bioarchaeologists have worked in many parts of the world including Mesoamerica (e.g. White et al. 1998, 2000, 2001, 2004b; Spence and Pereira 2007) Peru (Nelson 1998); South Africa (Pfeiffer and Sealy 2006), Egypt (Lovell and Whyte 1999; Melbye 1983; Molto 2000; Tocheri et al. 2005; White and Schwarz 1994; White et al. 1999); Sudan (White 1993; White et al. 2004a); Portugal (Jackes et al. 1997a, b); Italy (Prowse et al. 2008; FitzGerald et al. 2006); and Japan (Ossenberg 1986).

Summary Statement

The earliest practitioners of human skeletal studies in Canada (1848–1958) brought knowledge from England and Scotland and some influence on later works. It was largely in the 1960s, however, that a tradition of Canadian bioarchaeology took root, nurtured by frequent interactions between Canadian and American archaeologists and physical anthropologists. In part, a commonality of research interests in aboriginal cultural areas bordered by Canada and the USA—the Arctic, the Northwest Coast, and the Northeast (Great Lakes)—likely stimulated similar approaches to the studies of past peoples.

A rich methodological tradition developed in the 1960s by James E. Anderson is evident in much of contemporary Canadian bioarchaeology. Population relationships studied through the analysis of non-metric skeletal and dental traits are now being supplemented by ancient DNA studies. Today's palaeopathology includes modern diagnostic approaches along with classical descriptive methods. Modern histological and morphometric approaches have been added to the traditional gross anatomical methods of physical anthropology. International collaborations throughout the world have enriched studies of Canadian collections as well as the research questions and methodological approaches of Canadian scholars. Above all, ethical approaches to the study of human remains form an integral part of Canada's bioarchaeological landscape through collaboration and cooperation between archaeologists, physical anthropologists, and contemporary indigenous and non-indigenous communities.

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Chapter 8
The State of Approaches to Archaeological Human Remains in Greece

Anna Lagia, Anastasia Papathanasiou and Sevi Triantaphyllou

In the last two decades, the study of human skeletal remains in Greece has expanded significantly. Following on developments in the international academic community, it is now practiced not only by specialists in the biology of human bones but also by those interested more in their socio-economic and cultural dimensions. Fundamental to this development has been the expansion of archaeology as a field since the 1970s through its exposure to principles of New Archaeology, the inflow of knowledge from visiting scholars applying methods and techniques developed in the positive sciences, and the attraction to graduate programs abroad. The study of human skeletal remains in Greece has been largely shaped by concepts developed in other scientific and cultural contexts and is now evolving in the local setting.

A number of recent studies investigate the history and current status of human bone studies in Greece (Grmek 1989, 52–56; Agelarakis 1995; Roberts et al. 2005; MacKinnon 2007; Trubeta 2007; Buikstra and Lagia 2009; Eliopoulos et al. 2011; Lagia forthcoming). In this chapter, rather than reviewing the rapidly increasing bibliography, available in the above-mentioned references, we focus on academic and other institutional developments that have shaped past and present-day approaches to archaeological human remains in Greece. Through these we explore the different ways in which human bones are viewed and managed disregarding their multifaceted dynamics. Recent experience worldwide concerning the management of human skeletal remains (Buikstra 2006; Kakaliouras 2011) underlines

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their dual value as unique scientific tools and highly symbolic objects (Walker 2008) urging us to reflect on the ways in which approaches relating to their treatment could be refined.

The Development of Human Bone Studies in Greece

From its inception in the late nineteenth century to the present, the study of human skeletal remains in Greece has been conducted in two, thus far distinct, domains: in institutional establishments of the Greek state and by independent scholars working mostly as members of foreign schools of archaeology or local collaborations. While interaction between these two domains has always been important, in recent years the boundaries between the two have started to dissolve.

Institutional Developments in the Greek State

In Greece at the end of the nineteenth century, as in most European countries, the study of human skeletal remains became entrenched in the medical sciences. The foundation in 1886 of the Museum of Anthropology as part of the Medical School of the University of Athens marked the institutional establishment of anthropology in Greece (Agelarakis 1995, 157–160; Roberts et al. 2005, 36–37; Trubeta 2007, 124–128). Clon Stefanos, the Museum's first director until 1915, pursued his doctoral thesis entitled "La Grèce au Point de Vue Naturel, Ethnologique, Anthropologique, Démographique et Médical" at the University of Sorbonne (Stephanos 1884). He was responsible for the creation of the infrastructure of the Museum, including collections of crania initially curated at the Polytechnic School and the Department of Pathology and Anatomy in Athens, which led to the establishment of anthropology as a discipline (Grmek 1989, 54; Pitsios 1994, 7). The first chair in anthropology was created in his honour in 1915 at the school of medicine but was only later occupied by J. Koumaris, a surgeon by training (Koumaris 1939, 1961).

In 1924 Koumaris founded the Greek Anthropological Association and in 1925 became the first professor of anthropology at the University of Athens (Pitsios 1994, 8). His vision of anthropology as an interdisciplinary field was not welcomed by his contemporaries, reflecting "the then prevailing disagreement about the scope of anthropology in Greece as well as in Europe" (Trubeta 2007, 127–128). As in other parts of Europe in the nineteenth and early twentieth century where anthropology and archaeology were closely linked to the development of national identities (Kotsakis 1991; Detienne 2005; Hamilakis 2007; Damaskos and Plantzos 2008), anthropology in Greece followed nationalistic imperatives seeking intellectual and scientific links with ancient Greece. The Association was meant to foster research that would "provide scientific evidence for proving the phyletic

continuity of the Greeks" (Trubeta 2007, 127). It comes as no surprise that the overwhelming majority of earlier studies focused on prehistory and the establishment of craniometric indices of "Greek skulls". Koumaris' short training in Berlin under the supervision of Eugen Fischer (Agelarakis 1995, 158) most likely explains his alignment with typological thinking and his involvement with the eugenics movement. As in many contemporary societies in Europe and North America, scholars involved in the Greek Anthropological Association during the interwar years were eugenicists from other fields including medicine, archaeology, criminology and public hygiene who debated questions on race, eugenics and population policies. According to Trubeta (2007, 130–136), the absence of a welfare state and the divide between scientists and society at large appear to have deflected the full development and implementation of racial policies in Greece.

Despite Koumaris's zeal to train students in anthropology and his occupation of the chair in the faculty of medicine until 1950, the Museum of Anthropology did not succeed in training professionals in anthropology. It is claimed that Koumaris invited A. Poulianos back to Greece after he had trained in Moscow (Agelarakis 1995, 158). Poulianos was determined to reconstruct the racial history of the Greeks and other peoples of the Balkans (Poulianos 1968). The discoveries of the Middle- and Late-Pleistocene skulls of Petralona and Apidima in 1960 and 1978, respectively, absorbed the long-term interests of scholars working in the region (e.g. Poulianos 1981; Poulianos et al. 1982; Manolis 1996; Pitsios 2001). Poulianos was involved in the establishment of the Anthropological Association of Greece in 1971 and the Ephorate[1] of Speleology and Palaeoanthropology in 1978. His ethogenetic quests had a great impact on the next generation of scholars holding academic positions (e.g. Pitsios 1977; Xirotiris 1986). In recent years, scholars from other departments at the Medical School of the University of Athens have been also involved in the study of human skeletal remains, focusing on the application of molecular techniques in the identification of ancient pathogens (Papagrigorakis et al. 2008).

The political and cultural transformations that followed the regime change to democracy in 1974 and the integration of Greece into the European Union in 1981 resulted in a greater number of disciplines being involved in the study of archaeological human skeletal remains in Greece. While the founding of the Ephorate of Speleology and Palaeoanthropology of the Ministry of Culture in 1978 had a primarily administrative role aimed at the protection of palaeoanthropological sites around the country (http://www.yppo.gr/1/g1540.jsp?obj_id=2465), the Ephorate has also fostered interdisciplinary investigations that have decisively transformed the analysis of palaeoanthropological and prehistoric sites in Greece (e.g. Panagopoulou et al. 2004; Harvati et al. 2003, 2009, 2011, 2013; Richards et al. 2008; Zaatari et al. 2013; Stravopodi et al. 2009; Papathanasiou 2003, 2005, 2012, forthcoming).

[1] The term "Ephorate" refers to regional superintended units of the Greek Archaeological Service pertaining to the Ministry of Culture.

In academia, a chair in physical anthropology was established in the early 1980s at the Department of Animal and Human Physiology of the Faculty of Biology of the University of Athens introducing a curriculum in evolutionary and biological anthropology and opening the way for undergraduate and graduate education in the field (e.g. Manolis et al. 1994, 1995; Manolis 1996; Petroutsa and Manolis 2010). The Biological Anthropology Research Unit (BARU Eliopoulos et al. 2011, 175) of the Department of Biology, currently at a turning point due to economic pressures, has contributed to the education of a number of graduate and undergraduate scholars including overseeing doctoral dissertations conducted jointly with academic institutions abroad. Most importantly, since 1998 it houses and continues to build a modern reference skeletal collection (Eliopoulos et al. 2007) aimed at understanding the variability of morphometric characteristics in local populations and the diverse expression of pathological conditions in the human skeleton (Abel 2004; Brace et al. 2006; Lagia et al. 2007a; Manolis et al. 2009; Mountrakis et al. 2010; Charisi et al. 2011; Fox et al. 2011; Moraitis et al. 2014).

The BARU maintains strong links with the Department of Forensic Medicine and Toxicology of the Medical School of the University of Athens, contributing further to the understanding of pathological conditions and biological variability in local populations from a forensic perspective (Moraitis and Spiliopoulou 2006; Moraitis et al. 2009; Zorba et al. 2011, 2013). The Department of Forensic Medicine of the School of Medicine of the University of Crete has made a similar contribution through the creation of a modern reference skeletal collection for Cretan populations and the production of a number of papers in the field of human identification from the human skeleton (Kranioti and Michalodimitrakis 2009; Kranioti et al. 2008, 2009, 2011; Papaioannou et al. 2012).

In 1993, the Laboratory of Anthropology at the Department of History and Ethnology of the Democritus University of Thrace was founded in one of the most ethnically multifaceted regions in Greece. Through its context, the laboratory maintains an interest in the study of ethnogenetics but specializes also in human anatomy, palaeopathology, contemporary and historical demography, human evolution, primatology and palaeogenetics (http://utopia.duth.gr/~xirot/labor/index.html). The impact of graduate education in scientific institutions in Central Europe on Nikolaos Xirotiris, founder of the Laboratory (Xirotiris 1986), continues today through the close links of his successors with related institutions in Germany and Switzerland that emphasize the development of specialized techniques for the analysis of ancient human tissue (Papageorgopoulou and Xirotiris 2009; Papageorgopoulou et al. 2009, 2010, 2011; Suter et al. 2008; Wanek et al. 2012).

In the early 1980s, with the impact of the New Archaeology and the application of sciences in archaeological method and theory, departments of archaeology in Greece began to expand their curricula and include optional courses in environmental archaeology. The application of quantitative techniques and methods originating from the positive sciences attracted the interests of scholars who attempted to address questions of an ecological and economic nature in the analysis of their material, mostly from prehistoric contexts. In this period, the Department of

History and Archaeology of the University of Athens introduced a course in environmental archaeology. This led to the establishment in 2003 of the Laboratory of Palaeoenvironmental Research, embracing the analysis of archaeological human bones as well as archaeobotanical, archaeozoological and archaeolomalacological remains (http://www.arch.uoa.gr/sylloges-ergastiria/ergastirio-periballontikis-arxaiologias.html).

Gradually other departments of archaeology around the country (the Universities of the Aegean, of Thessaly, and of Crete) started offering courses in the archaeological sciences albeit on a temporary basis. However, not all courses were delivered by scholars specializing in human bone studies. These courses provided an overview of all fields encompassed by the term "bioarchaeology" as differently understood in some European countries as contrasted with North America (Roberts 2006). In the British tradition, the term bioarchaeology has been modified to include all biological remains, not only human, becoming synonymous, in a way, with environmental archaeology. This exposure to fields other than traditional archaeology inspired a large number of students to pursue graduate studies in relevant fields abroad (Roberts 2006, 230–231). A number of these graduates today occupy temporary and permanent positions in the archaeological service and academic institutions.

In 2008, the first faculty position focusing on prehistoric archaeology and osteoarchaeology was created at the Department of History and Archaeology at the Aristotle University of Thessaloniki, building on the department's tradition in environmental studies but also in archaeological theory and method. The official embrace of osteoarchaeology modules by the faculty of Humanities at the Aristotle University of Thessaloniki marks a constant and demanding quest for the desirable convergence of archaeology with human bone studies. Inquiries which focus on the management of death but also on perceptions discussed in modern theoretical literature on the human body and personhood in relation to material culture and social life have inspired a new way of viewing human bone studies. As an instrumental tool, human bone studies illuminate the comprehension of body representations, performances and experiences, the manipulation of the body in life and death or the negotiation of gender, age but also issues such as deviant burials in social life (Crevecoeur and Schmitt 2009; Crevecoeur et al. in press; Ingvarsson-Sundström 2002, 2008; Triantaphyllou et al. 2008; in press a; in press b; Tsaliki 2010).

The combination of required courses that focus on the integration of archaeological sciences and theory along with the systematic training of archaeology students (who later join the Greek Archaeological Service) in fieldwork run by the University has increased awareness of the systematic collection and significance of bioarchaeological remains in the reconstruction of past life ways. Following the deep economic crisis that began in 2009, when Greece and its state higher education were under great pressure, all temporary academic posts were withdrawn and human bone studies in the Departments of History and Archaeology currently are taught on a full-time basis only at the Aristotle University of Thessaloniki.

Independent Scholarship

Throughout the twentieth century but also from the beginning of the foundation of anthropological studies in Greece at the end of the nineteenth century, visiting scholars from a number of European and North American countries have contributed to the study of human skeletal remains as members of scientific teams of, for the most part, foreign schools of archaeology.

The presence of Rudolf Virchow in the Eastern Mediterranean at the end of the nineteenth century is notable and less well known. In 1879, Virchow accompanied H. Schliemann to his excavations in Troy (Virchow 1882) and Cyprus (Virchow 1884), while he also visited Athens to analyse skulls from diverse contexts (Virchow 1893). Virchow underscored the historical and topographical setting of his analyses and meticulously described the archaeological context in which the skeletal remains were found (e.g. Virchow 1893, 6–7). His approach, which included information on burial enclosures, animal and botanical remains, and ceramic, metal and lithic finds along with the human remains, could be termed under modern standards as holistic. Drawings of great detail and refinement accompanied his publications. Curiously, his references to pathological conditions were rare, leading Grmek (1989, 53) to conclude that "in truth, the great pathologist neglected palaeopathology". His observations on foetal remains in clay pots in Troy remain underused as does his search for indications of cranial deformation.

Virchow's use of craniometry, including brain capacity, followed the typological system of Retzius and searched for population movements including differences by sex. He was very cautious about drawing conclusions concerning population affiliations, acknowledging the large gaps in existing data (Virchow 1882, 125–126). Rather than being typological, Virchow's use of craniology and cephalometry was at odds with many of his contemporaries, in that he used them to disprove concepts of racial purity that were prevalent in his era. His frequent reference to the development of muscle insertions and his endorsing the view of platycnemia being the result of plasticity rather than heredity (Virchow 1882, 14–15) attest to his contribution to the development of the tradition in anthropology that "focused on the plasticity and adaptability of the body over a lifetime" (Pearson and Buikstra 2006, 208).

In the early twentieth century, most German, British, Swedish, French and American scholars working in Greece (e.g. Boyd 1900–1901; Duckworth 1902–1903; Fürst 1930; Breitinger 1939; Charles 1958) focused on understanding the biological make-up of the populations they analysed. Observations on pathology were not uncommon (e.g. Fürst 1930, 121–123), while the application of techniques such as sieving (Breitinger 1939, 257) that otherwise needed several years to be utilized in the excavation of cremations is notable. The extensive use of typology in this period to assess provenance and population movement was undermined by the assessment of extensive variability and heterogeneity in the populations under study. Breitinger (1939, 253) in his study of early Iron Age

skeletons from Athens concluded that the "only statement that could be made with certainty was that of extensive racial mixture".

The arrival of J.L. Angel in the Eastern Mediterranean in the late 1930s changed the character of anthropological analyses and laid the foundations for the field of bioarchaeology (Buikstra 1990; Roberts et al. 2005, 40–45; Pearson and Buikstra 2006, 207–210; Buikstra and Prevedorou 2012). Angel, like his mentor Hooton, had training in classics and ingeniously was able to incorporate environmental, archaeological and anthropological parameters in the study of cemeteries. His holistic approach endorsed the analysis of large skeletal samples, which were now available to him through a number of large-scale excavations in Greece, Cyprus and Asia Minor.

Throughout his career, Angel maintained an interest in "tracing migration, blending and internal evolution". He used six morphological types and five subtypes that were geographically and culturally determined, and acknowledged the influence of the environment (climate and disease) in addition to heredity in their formation (Angel 1971, 35). Angel accepted the artificial character of morphological types, which he considered nevertheless necessary to describe the tremendous variability evident in his samples (e.g. Angel 1943, 248, 1971, 97). He reported his craniometric data providing means, standard deviations and variability for each sex, while compared finds among sites and periods (Angel 1944, 334–335, 1971, 96–101).

Angel's theoretical shift and expanded framework of analysis between his early and late work, along with his painstaking efforts to bridge archaeology and anthropology, his numerous contributions and pioneering observations are thoroughly surveyed by Jacobsen and Cullen (1990) and Buikstra and Prevedorou (2012). Certainly, some of his findings and assumptions have required revision, as Angel noted himself in his later publications, for example the issues concerning the identification of porotic hyperostosis and its relation to thalassaemia (Angel 1964, 1967, 1971). Impressive, however, is the number of observations and concepts by Angel that are confirmed today through molecular genetics and stable isotope analysis.

From the late 1970s onward, visiting scholars with diverse educational backgrounds grounded on the physical sciences ranging from anatomy(Musgrave 1976, 1980), dentistry (Foudoulakis 1987) and physical anthropology (Breitinger 1980; Bisel 1990; Duday 1981; Angel 1984; Bisel and Angel 1985; Wall et al. 1986; Agelarakis 1987; Barnes and Ortner 1997; McGeorge 1988) worked in Greece making use of minimal resources, including infrastructure, to conduct their analyses. Their work fostered collaboration with field archaeologists and provided the foundation for later changes, although studies of human bone remains continued to consist primarily of skeletal reports utilized as appendices in archaeological publications.

The scientific landscape changed drastically in the 1990s when an increasing number of students pursued their graduate studies in European or North American universities, while international scholars with relevant training chose to conduct

their research in Greece. What triggered this interest? The impact of "New Archaeology" and a dilatory understanding of the significance of the application of scientific tools in archaeological method and theory as well as the long-term work of early scholars in archaeological human bone collections in Greece almost made it necessary to systematically collect and analyse human remains. The study of human remains was no longer limited to a few specialists from the medical sciences; it now attracted the interest of archaeologists who realized they could address many of their questions through the contextual analysis of the human remains. In the last fifteen years in particular, issues engaging the social aspect of bioarchaeological studies such as diet, physiological and occupational stress factors, demographic profiles and mortality patterns in different population groups, and more recently, mobility patterns and migration and human bone taphonomy and mortuary practices dominate in human bone studies in Greece.

To date research that is independent of state scientific institutions remains an important component of anthropological studies in Greece, sustained by the individual collaborations of scholars with foreign and local research groups (e.g. Liston 2007; Vanna 2007; Lagia et al. 2007a, b, 2013; Rife et al. 2007; Schepartz et al. 2009; Hillson 2009; Nafplioti 2009; Iezzi 2009; Fox et al. 2012). Occasionally, specialists are employed by the Greek Ministry of Culture (e.g. Tritsaroli 2006, 2010; Bourbou and Niniou-Kindeli 2009) but more often than not, cemetery contexts are excavated in the absence of specialists in field anthropology.

Current Conditions Surrounding the Analysis of Human Skeletal Remains in Greece

Legislation and Management

The protection of human skeletal remains encountered in archaeological sites in Greece falls under the auspices of the Ministry of Culture and is administered by legislation that does not differentiate human bones from other archaeological objects (Eliopoulos et al. 2011; Charalampopoulou 2013). Nevertheless, knowledge from field anthropology (Duday 2006) and awareness of the need for a "scientifically rigorous, theoretically relevant and ethically conscious" anthropology (Turner et al. 2006, 219) dictates the specialized handling of human skeletal remains at all stages of their analysis. Given the scope of far-reaching developments surrounding their management (Buikstra 2006; Kakaliouras 2011), it seems imperative that the dual role of human remains as scientific tools and objects with intense symbolism (Walker 2008) be introduced in current legislation taking into account the cultural and religious specificities of the modern state (see also Lagia forthcoming).

Infrastructure

Besides the few positions in state universities, the Ministry of Culture remains today the main employer of human bone specialists in Greece, either on a permanent, or, more often, a temporary basis. It is noteworthy, however, that these specialists have been appointed as *archaeologists*. Therefore, their major responsibility remains the rescue, protection and study of antiquities in general rather than of human bones in particular. As the primary purpose of the numerous units organized by the Greek Archaeological Service is the protection of antiquities, research has a lower priority, further impeded by inadequate funding. A notable void exists in terms of storage in the many local Ephorates and museums across the country and in facilities adequate for human bones analyses. The former creates major problems in the maintenance and curation of skeletal assemblages, resulting in a large number of archaeological human remains not being curated at all.

In terms of analysis, aside from the local Ephorates that occasionally provide basic facilities for their in situ study, high quality anthropological analyses can be conducted at the laboratories of the university departments described above and the Wiener Laboratory at the American School of Classical Studies in Athens. Since its foundation in 1993, the Wiener Laboratory has played a substantial role in the support of interdisciplinary research in Greece including the study of human skeletal remains. Through its fellowships and infrastructure it provides support not yet available from the Greek state. A fellowship honouring the memory of J. L. Angel, one of the founders of the bioarchaeological approach, is offered annually by the Wiener Laboratory besides funding related to all fields of analysis of archaeologically derived material (http://www.ascsa.edu.gr/index.php/wiener-laboratory).

Sources of funding for anthropological research are scarce and mostly stem from private Greek Foundations such as the Onassis and Latsis Foundations and, in addition to the Wiener Laboratory, international institutes such as the Institute of Aegean Prehistory, and the Fitch Laboratory of the British School at Athens.

Current studies

As shown in the overview provided in the first section of this chapter, the study of human skeletal remains in Greece has accelerated in recent years. Over 100 sites have been analysed or are in the process of analysis covering a broad temporal and regional spectrum shown on Fig. 8.1, in which, however, prehistoric sites still predominate. It is worthy of note that this figure reflects only a small portion of what has actually been excavated, collected, stored and rescued after post-excavation treatment, which underscores the potential of human bone studies in Greece (Table 8.1).

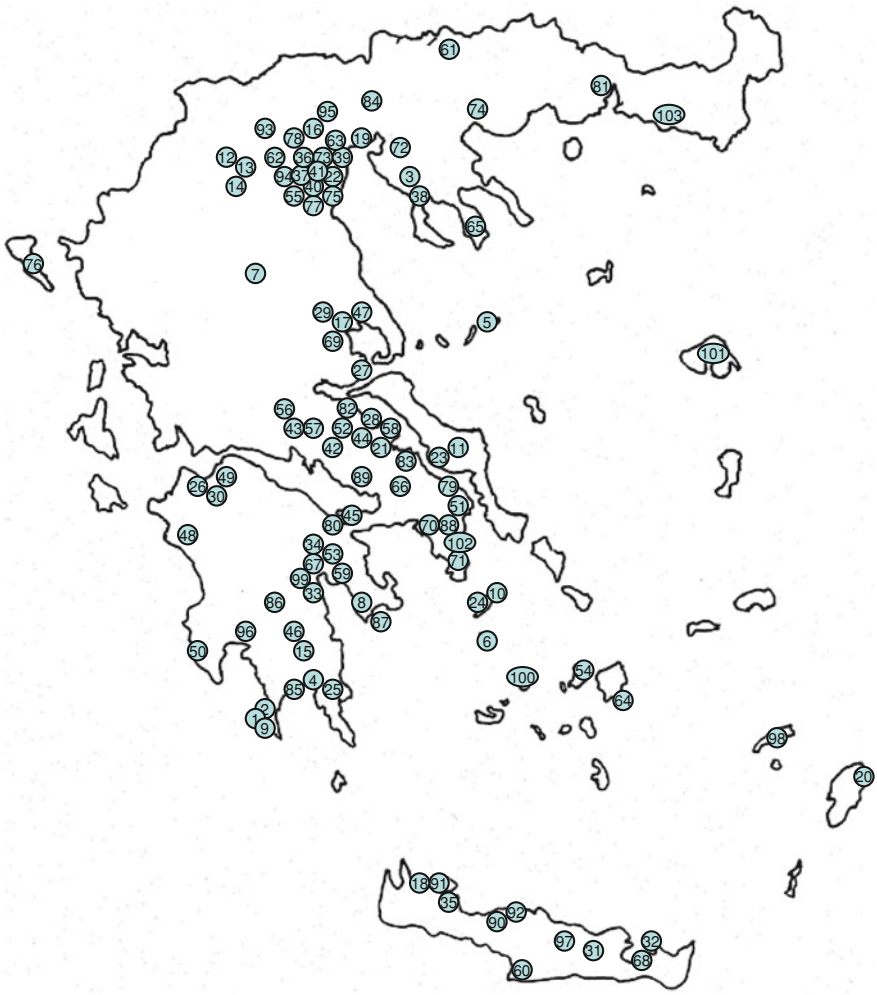

Fig. 8.1 Map of Greece depicting the sites that have thus far been analysed

Apart from the standard exploration of questions addressing health and disease (Buikstra and Lagia 2009, 14–17), a significant area of research in contemporary human bone studies in Greece is the modelling of diet and nutrition through $\delta^{13}C$ and $\delta^{15}N$ stable isotope analysis (Triantaphyllou et al. 2008; Vika 2011; Petroutsa and Manolis 2010; Papathanasiou et al. 2012; Bourbou et al. 2011, 2013) and mobility through $\delta^{34}S$ (Vika 2007), strontium (Nafplioti 2008, 2011) and oxygen stable isotopes (Garvie-Lok 2009). It is remarkable that in the last two decades, Greece has moved from being an essentially *terra incognita* in terms of stable isotopic studies to one of the most intensively analysed regions. Interestingly, a

Table 8.1 Explanatory table to the sites shown in Fig. 8.1

1	Apidima	P	35	Armenoi	B	69	Alos	C
2	Kalamakia	P	36	Koilada	B	70	Athens	C
3	Petralona	P	37	Goules	B	71	Laurion	C
4	Lakonis	P	38	Agios Mamas	B	72	Agia Paraskevi	C
5	Gioura	M	39	Korinos	B	73	Ancient Pydna	C
6	Maroulas	M	40	Spathes	B	74	Amphipolis	C
7	Theopetra	MN	41	Treis Elies	B	75	Olympus tumuli	C
8	Franchthi Cave	MN	42	Modi	B	76	Garitsa/Almyros	C
9	Alepotrypa Cave	N	43	Kolaka	B	77	Karitsa	C
10	Kephala	N	44	Tragana	B	78	Kladeri	C
11	Tharrounia	N	45	Perahora	B	79	Ramnous	C
12	Mavropigi	N	46	Koufovouno	B	80	Korinth	C
13	Pontokotm	N	47	Kazanaki	B	81	Abdira	C
14	Xirolimni	N	48	Agia Triada	B	82	Ag. Dimitrios	C
15	Kouveleiki	N	49	Voudaini	B	83	Akrefnio	C
16	Nea Nikomedeia	N	50	Pylos	B	84	Nea Philadelphia	C
17	Sesklo	N	51	Ag. Kosmas	B	85	Tsirivakos, Gythio	Z
18	Gerani	N	52	Atalanti	B	86	Asea	Z
19	Stavroupoli	N	53	Aspis	B	87	Hydra	Z
20	Kalvthies	N	54	Chalandriani	B	88	Spata	Z
21	Proskvnas	NB	55	Rymnio	B	89	Xironomi	Z
22	Makrigialos	NB	56	Zeli	B	90	Eleutherna	Z
23	Manika	B	57	Kalapodi	B	91	Khania	Z
24	Agia Eirini	B	58	Mitrou	B	92	Stavromenos	Z
25	Sykia	B	59	Asine	B	93	Filotas	Z
26	Spaliareika	B	60	Odigitria	B	94	Aiani	Z
27	Androna	B	61	Faia Petra	B	95	Sourtara	Z
28	Kynos	B	62	Valtos Leptokarias	B	96	Messene	Z
29	Velestino	B	63	Pigi Athinas	B	97	Kastella	Z
30	Kalamaki	B	64	Keros	B	98	Kos	Z
31	Ag. Charalambos	B	65	Kriaritsi	B	99	Andritsa	Z
32	Mohlos	B	66	Thebes	BCZ	100	Sifnos	Z
33	Lema	B	67	Argos	BC	101	Lesvos	Z
34	Mycenae	B	68	Kavousi	C	102	Kalivia	Z
						103	Maronia	Z

P Paleolithic, *M* Mesolithic, *N* Neolithic, *B* Bronze Age, *C* Classical, *Z* Byzantine

variety of laboratories in the UK, the USA and Canada have been involved in these analyses, their results complementing each other (Papathanasiou forthcoming).

Another area that is also evolving is that of ancient DNA. Besides the well-known interest in questions of genetic relatedness, research in this area has extended to include inter-regional affiliations, sex determination of juveniles and the development of techniques of aDNA retrieval and authenticity (Evison 2001; Chilvers et al. 2008; Bouwman et al. 2008; Georgiou et al. 2009; Kovatsi et al. 2010; Kanz et al. 2010). The application of new techniques extends to modelling behaviour and the specialized analysis of dental remains, microwear analysis and histological longitudinal cross sections, to address, respectively, questions relating to gender differentiation in diets in Middle Bronze age populations (Voutsaki et al. 2006; Triantaphyllou 2010), and the study of perinatal death and its implications for mortuary practices (Kanz et al. 2010).

The increase in studies from the late 1970s onwards is all the more impressive given the paucity of research prior to that time. Most early studies can be characterized today as "descriptive" by their limited use of statistical techniques and analytical procedures. Such studies, comprise an important component of anthropological investigations to date, establishing a valuable body of comparative data on sites and periods thus far unknown. Nevertheless, access to this body of evidence frequently requires meticulous searching in monographs, conference proceedings and periodicals largely detached from mainstream journals.

The lion's share of research in flagship journals concerns stable isotopic analyses focusing on diet and mobility, the isolation and characterization of ancient DNA and the development of standards for the assessment of demographic characteristics in local population (see above for references). The engagement of scholars in multidisciplinary projects addressing questions of social and economic importance and culture change, testing alternative hypotheses, analysing larger series of samples and applying state-of-the-art techniques has decisively altered the way human skeletal studies are viewed today. Such developments parallel the study of skeletal remains from palaeoanthropological contexts, radically transformed in recent years through the close collaboration between units of the archaeological service and academic institutions in Greece and abroad.

The Future

An overview of institutional developments in the study of human bones in Greece suggests that instruction has been shared between academic fields that have traditionally been considered disparate. The teaching of anthropology in departments of biology, medicine or even the Department of History and Ethnology of the University of Thrace with their tradition in the exploration of the biology of human bones does not appear to converge with its instruction in departments of archaeology, where emphasis is placed on social questions and questions on meaning. A review of the roots of bioarchaeology in Europe and the USA (Buikstra and

Beck 2006) suggests that it is the consideration of their cultural dimensions, encompassing perceptions about life and beliefs about death, that has been the catalyst in advances in approaches towards human skeletal remains. The fact that today most practitioners begin their studies from archaeology, separated from other branches of anthropology, probably explains the difficulties in integrating the cultural dimensions of human bones in their management and study. It is possible that current movements in archaeology itself requiring the consideration of formation processes (e.g. Schiffer 1987; Weiss-Krejci 2011) and parameters thus far unaccounted for in relation to the management of cultural heritage (such as the public, Sutton and Stroulia 2010) will generate further changes in the management of human skeletal remains.

Even so, a fundamental difference in the perception of bioarchaeological studies between North American and European institutions, where, in the latter, fields other than the study of human skeletal remains are also included, could work positively toward the foundation of multifaceted interdisciplinary institutes. This might result in an enhancement of the already existing institutes of the Ministry of Culture and thus far separate academic institutions such as the Museum of Anthropology of the University of Athens.

There are now initiatives taken among practitioners of diverse disciplines and administrators in state institutions aiming to bridge perspectives in the management of archaeological finds, including human skeletal remains. Recent proposals for a different agenda in the management of cultural heritage (Voutsaki and Valamoti 2013) underscore the importance of increasing awareness of the potential of scientific investigations, of involving specialists in all steps of decision-making surrounding archaeological material, of disseminating scientific results electronically and of remaining ethically conscious not only towards the administrative authorities but to the archaeological material itself.

In this context, decisions surrounding the excavation, storage and provision of permissions for the study and analysis of human skeletal remains need to consider not only their scientific value but also their potential symbolism for living communities (Sutton and Stroulia 2010; Hamilakis 2010). As recently articulated (Fotiadis 2010, 453), the absence of archaeology from formal education in addition to legal strictures surrounding antiquities leave archaeological remains "entirely at the disposal of the state" impacting negatively not only on the success of their management but also on the application of existing legislation aiming to protect finds from the moment of their discovery.

In addition to the large number of visiting scholars contributing major efforts in the analysis of human skeletal remains in Greece, in recent years the number of Greek scholars involved in the field has significantly increased. Still, the largest part of analytical investigations is conducted in foreign scientific institutions in Greece or abroad (Charalampopoulou 2013, 233) highlighting gaps in infrastructure that need to be addressed. Along with these, improvements are needed in the way cemetery excavations are conducted and human skeletal remains are stored. These comprise two steps on the way from the field to the laboratory where the greatest part of information is often lost (Milner et al. 2008, 571–574; Lagia forthcoming).

The furthering of the education of practitioners in field schools where techniques in field anthropology (sensu Duday 2006) are taught; the employment on a permanent basis of specialists in the excavation of funerary contexts in the local archaeological units; the creation of data banks with information on the available collections along with other finds of the funerary milieu; and finally, the application of existing legislation surrounding the protection of human remains from the time of their discovery, are imperative for the future of human skeletal studies in Greece.

It is clear that the requirements for the excavation, curation and management of the many mortuary contexts excavated each year around the country and the administration of the already curated skeletal collections cannot be covered by the permanent and temporary scientific personnel working for the archaeological service in Greece. Nor can existing conditions of storage secure their optimal preservation for the future or their archiving in order to facilitate accessibility and improve efficiency in their management. The misguided excavation of mortuary contexts in the absence of scholars specialized in human skeletal remains affects not only their quantity and therefore the statistical rigour of large-scale analyses, but also nuanced interpretations of funerary practices. As bizarre as the excavation of settlements and temples in the absence of archaeologists and architects would be, so regrettable and with incalculable long-term consequences is the excavation of cemetery contexts in the absence of human bone specialists.

The human resources that can handle these manifold tasks exist and need to be harnessed in a more systematic way than the facultative employment of scholars during excavation and analysis. Current poor economic conditions, besides limiting the already meagre funds allocated to interdisciplinary investigation, have highlighted the domains where present day anthropology must contribute further. Aside from the areas mentioned above, these include the refinement of perceptions on modern identities in relation to past local histories disengaged from nationalistic distortions that have resurged forcefully in the current socio-economic climate.

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Chapter 9
Themes in Icelandic Bioarchaeological Research

Hildur Gestsdóttir

Historical Background

Iceland is situated in the middle of the North Atlantic, just south of the Arctic Circle. It covers an area of 103,000 km^2 (39,769 square miles), only 23 % of which is habitable, mostly along the coastline (Landmælingar Íslands 2012). Iceland has one of the youngest landscapes on the earth; it is an active volcanic island that emerged from the sea over the last 25 million years and one of the few places on earth where the Mid-Atlantic Ridge is exposed above sea level (Guðmundsson 2007). Iceland is also the youngest settlement in Europe. The *Book of Settlements* and the *Sagas of the Icelanders,* the earliest versions of which date from the thirteenth century AD, record that Iceland was settled by Vikings from Northern Norway in AD 874 and state that the entire country was settled simultaneously over a period of 60 years (Karlsson 2000). There are only a handful of archaeological finds predating this (Vésteinsson and McGovern 2012), supporting a late ninth century date for the settlement of the island. In the early years of archaeological research, in the latter part of the nineteenth and early part of the twentieth century, the Sagas were taken to be historically accurate and were frequently used as road maps for archaeological excavations. This is reflected in the excavations of settlement period Viking burials, where the main aim was often to name the "chieftain" buried there based on the relevant Saga. This can be seen Brynjúlfur Jónsson's report of his visit to Hauganeshaugur in 1903, where human skeletal remains were reported to have been exposed by erosion,

> They [the skeletal remains] are probably associated with the battle described in Chapter 28 of Harðar Saga. And Brandur from Miðfell was possibly buried in the mound.
> Jónsson (1904: 19. Translation by the author).

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B. O'Donnabhain and M. C. Lozada (eds.), *Archaeological Human Remains*, SpringerBriefs in Archaeology, DOI: 10.1007/978-3-319-06370-6_9,

By the early decades of the twentieth century, historians and archaeologists alike began to recognize that although some of the people mentioned may have existed, these documents were not accurate descriptions of people and events. By the 1950s, it was generally accepted that the period prior to the twelfth century AD represented the pre-historic period of Iceland's past (Vésteinsson 1998). This change was brought about within archaeology by Kristján Eldjárn, who was a keen supporter of the anonymity of the archaeological record and a move away from a reliance on the Sagas (Gestsdóttir 2012). Despite this, it is still common to encounter the perception that the entire history of Iceland is documented and archaeologists in Iceland today still have to argue that the discipline is a viable independent field, using material culture to interpret the past; not just a subsidiary of historical research, a way of illustrating the documentary sources with no grander aims than to prove or disprove what is written. It is not uncommon for the excavator of human skeletal remains to have to answer questions from interested visitors about the identity of the individuals they are digging. It is therefore curious to note that the question of the ethics and the excavation of skeletal human remains is rarely discussed outside the discipline (Arnarsdóttir 2009).

Human remains in Iceland are primarily recovered from two contexts, pre-Christian Viking inhumation burials and Christian inhumation cemeteries. The Viking burials vary from single inhumations to burial groups, the largest of which excavated to date contained 14 individuals (Eldjárn 2000). Viking age burials in Iceland lack the grandeur of the burials found in other parts of the Viking world. They are usually shallow pits, sometimes lined with stones, usually contain some grave goods and frequently animals, usually horses, and probably never covered with more than a small mound (Friðriksson 2004). The earliest Viking burials are dated to the latter part of the ninth century, and none post-date the middle of the eleventh century AD. The Christian cemeteries typically contain supine burials orientated east–west, with or without a coffin, surrounding a central church or chapel and usually surrounded by some sort of boundary. These are frequently seen to be dated post AD 1000; the documented date of the conversion of Icelanders to Christianity (Karlsson 2000), although recent excavations of early cemeteries indicate a much earlier date for some of the sites (Zoëga and Traustadóttir 2007). It is common to see that an attempt is made to fit any excavated skeletal remains into either of these categories, pre-Christian Viking burial or Christian cemeteries. It is, however, likely that the true story is much more complicated and that much work remains to be carried out on the context of human skeletal remains in Iceland (Fig. 9.1).

Early excavations of burials in Iceland concentrated on the Viking graves. While little bioarchaeological work was associated with this research, it is to the credit of these early pioneers that most of the skeletal remains were curated and are available for analysis at the National Museum (established 1863). In fact, among the earliest acquisitions of the Museum were the skeletal remains from the Viking burials from Hafurbjarnarstaðir in southern Iceland in 1868 (Gestsdóttir 2004).

Bioarchaeological research in Iceland is usually traced back to Jón Steffensen's (professor of anatomy and biophysics at the University of Iceland) participation in

Fig. 9.1 Viking age burial from Hringsdalur in western Iceland, found in 2006. Unprompted by the archaeologists on site, the media started reporting that the remains of Hringur, the settler of the valley had been found. There is, however, no mention of anyone by that name in the Sagas (Photo Adolf Friðriksson)

the excavation of the cemetery at Skeljastaðir in south-western Iceland in 1939, which was the first large-scale published archaeological excavation of a Christian cemetery in Iceland (Steffensen 1943). However, skeletal remains had been removed from cemeteries at two locations previously, although no records of these excavations survive. Skeljastaðir was excavated in 1935 by Eiður Kvaran. The skeletal remains were taken to Germany, where Kvaran died two weeks before the outbreak of World War II: the skeletons and Kvaran's work were never recovered (Þórarinsson 1968). Haffjarðarey in western Iceland was visited in 1905 by Viljhálmur Stefánsson, although he most likely only took bones exposed by the erosion of the island. These skeletons are currently housed at the Peabody Museum of Archaeology and Ethnology in Harvard (Steffensen 1946). This latter collection is the basis of the earliest publication on bioarchaeology in Iceland by Hooton, in the very first issue of the American Journal of Physical Anthropology, focusing on the question of the origin of Icelanders (Hooton 1918). Until his death in 1991, Jón Steffensen was the only active bioarchaeologist in Iceland and he analysed all the human skeletal remains recovered in Iceland during these five decades. Steffensen's chief research interests were changes in stature through time as an indicator of health and craniometrics in relation to the study of the origin of Icelanders

(Magnússon 1992), a topic that features heavily in Icelandic bioarchaeological research today. However, despite working closely with Kristján Eldjárn, focus on the individual did also continue to feature heavily in Jón Steffensen's work. A large part of his report on the skeletons from the 1954 excavation of the cemetery at the bishopric at Skálholt in southern Iceland concentrates on naming individuals, based on inscriptions on coffins, comparisons of skeletons to portraits of known individuals and historical descriptions of burial sites (Steffensen 1988), and the same can be said of one of his last projects, the analysis of skeletons excavated at the cemetery at the bishopric at Hólar in northern Iceland in 1988 (Snæsdóttir 1991) (Fig. 9.2).

Current Status of Bioarchaeological Research in Iceland

Since Jón Steffensen's day, the number of bioarchaeologists in Iceland has more than doubled with a handful of people working in the field, and the number of visiting bioarchaeologists who are involved in various projects is constantly on the rise. Archaeology and anthropology is taught at the University of Iceland. Undergraduate courses in bioarchaeology and physical anthropology are on offer, but it is not possible to specialize in the field in Iceland. Those who have specialized have mostly received their education in England, which has influenced the way bioarchaeology is conducted. What separates Icelandic bioarchaeology from many other countries, however, is that it has always been closely linked with archaeology. Jón Steffensen, although not trained in the field, was a prolific excavator, participating in numerous excavations during his career (Magnússon 1992). Most of the people working in the field today have a background in archaeology and are involved in research in the field unrelated to bioarchaeology. The small number of people in the field reflects one of the issues that defines Icelandic bioarchaeological research the most, that of scale. Not only are there few people working within a relatively short timescale but the populations available for study are small, the largest excavated sample to date consists of about 260 skeletons (Kristjánsdóttir 2012). However, most cemeteries are smaller than that. Known medieval cemeteries do not have more than an estimate of 150 burials, and many of the larger cemeteries are still in use today (Gestsdóttir 2004). Another factor associated with scale is the type of populations available. With the small population of Iceland (the country's population today totals 320,000 people), there is little cultural or status variation between the cemeteries. They served the local population, rich or poor, sailor or farmer, so we do not see, for example, much in the way of high status cemeteries or battle site burials, although in some instances, there is a difference in the treatment of individuals within cemeteries, which might be indicative of status (Eldjárn 1988). This means that most of the population work within bioarchaeological research has focused on the small local medieval cemeteries; many of which were probably mainly family plots, serving the farm on which they were situated, possibly including a few of the neighbouring farms

Fig. 9.2 Jón Steffensen (1905–1991) the first active bioarchaeologist in Iceland, working at the 1954 excavation in Skálholt (Photo Gísli Gestsson)

(Vésteinsson and Gestsdóttir 2011). One exception to this is the excavation at the Sixteenth century monastery cemetery at Skriðuklaustur in eastern Iceland. A hospice was run at the monastery, and preliminary analysis of the material suggests that the cemetery served the hospice, so this collection is a valuable addition to palaeopathological research in Iceland (Kristjánsdóttir 2012).

The total collection for Iceland counts only approximately 1,300 skeletons. These are, however, mostly stored in the National Museum, and all excavated skeletal remains are recorded in a central database (including those curated outside the National Museum), so in most cases, access to the material is easy. In addition, all human skeletons, wherever they are housed, are stored in acid-free cardboard boxes, specifically designed for skeletal remains. This means that any project can include a large percentage of the curated material.

Legally, all material culture, human skeletons included, older than 100 years are classified as archaeology in Iceland and are protected as such. The Cultural Heritage Agency of Iceland oversees these and grants permits for their excavation. The law states that all archaeological material is to be handed into the National Museum of Iceland for curation no later than 5 years after the completion of the excavation. After this, any permission to analyse or take samples from skeletal remains is granted by the National Museum (Zoëga and Gestsdóttir 2010). In the past, most excavations of human skeletal remains were rescue excavations because of either erosion or development-led work. This has changed in the last decade, with an increase in research-led and funded excavations both of Viking Age burials: for example, excavations of several Viking Age burials in Þingeyjarsýsla in northern Iceland (funded by Hið Þingeyska fornleifafélag and the Icelandic government) (Roberts 2008) and Christian cemeteries, for example the excavation of the cemetery associated with the Sixteenth century monastery at Skriðuklaustur

(funded by among others, Kristnihátíðarsjóður, the Leodardo da Vinci progamme, the Culture 2000 programme, the Icelandic Centre for Research and the Research fund of the University of Iceland) (Kristjánsdóttir 1995).

The research theme which possibly characterizes Icelandic bioarchaeology the most is associated with its youth, both in terms of geology and settlement. Studying the origin of settlers and the pattern of settlement features heavily in approaches to research questions. Jón Steffensen's and Hooton's work on craniometrics have already been mentioned (Steffensen 1975; Hooton 1918). More recently, Benedikt Hallgrímsson et al. published an article on the use of cranial non-metric traits to identify the origin of the settlement population (Hallgrímsson et al. 2004). Jón Steffensen and Benedikt Hallgrímsson conclude that to varying degree, Icelanders can trace their roots to Norwegians (in concordance with the written sources) and the Irish (who are mentioned in the written sources, but their importance and numbers are downplayed). This is mostly in agreement with recent DNA analysis of both modern Icelanders and samples taken from the dentition from pre-Christian Viking Age skeletons, which suggests that the matrilineal ancestry of Icelanders is Scottish/Irish, while the patrilineal ancestry is Norwegian (Helgason et al. 2000, 2009).

Current research has expanded these questions, to not just trying to locate the origins of Icelanders, but to study the pattern of settlement in Iceland, and to a larger extent the Viking period North Atlantic, through the use of isotope analysis of dental enamel (funded by the National Science Foundation and the Icelandic Centre for Research). Iceland is an ideal place to study isotopic provenance on human remains because of its unique geological nature within the North Atlantic. The work so far has mainly focused on analysis of strontium isotopes, which has a very low isotopic signature in Iceland, because it is geologically very young, while the most likely places of origin are geologically old, and therefore have a high strontium isotopic signature. Strontium from the environment enters the body through the diet and is stored in the teeth, which of course do not regenerate, so the signature in the enamel reflects that of the environment the individual lived in for the first years of his life. The large difference between Iceland and the likely places of origin means that the difference between those born in Iceland and born elsewhere is very great, and this method can easily be used to identify the immigrants (Price and Gestsdóttir 2006). To date, 83 skeletons from Viking Age burials have been sampled, and of those, at least 27 (39 %) were not born in Iceland. Work is ongoing on carrying out further isotope analysis in Iceland and elsewhere in the North Atlantic to try and identify the places of origin of these individuals, as well as "map" isotopically the North Atlantic Viking Age to try and trace population movement in the area. This work is being carried out under the direction of Dr. Price at the University of Wisconsin, with the collaboration of institutions and universities throughout the North Atlantic—Iceland, Norway, Denmark, Scotland, Ireland and Greenland. Although we cannot as yet say much about from where these settlers originated, the data are providing new insights into the pattern of settlement. For example, there is a much higher percentage of immigrants in Northern Iceland (55 % as opposed to the 39 % in the country as a whole, possibly

indicating that the north was the initial point of settlement) or that the "settlement period" lasted longer there (Price and Gestsdóttir, in press). In addition, these results are raising questions as to how we are identifying the early burials, and whether we are still guilty of using pre-conceived notions based on the written sources on which to base our archaeological interpretations.

The Future of Bioarchaeological Research in Iceland

One of the themes that is starting to feature more prominently in Icelandic bioarchaeology and will most likely affect a lot of work in the future is that of associations, directly and indirectly, with volcanism. One such is the ongoing project analysing sulphur isotopes to look at diet in the human skeletal remains from the site of Hofstaðir in northern Iceland (Sayle et al. 2013), to find a way to correct for the freshwater effect in Iceland. This is caused by the release of 14C-depleted carbon into water systems during geothermal activity, thus making the radiocarbon dating of any species likely to have been consuming freshwater fish in Iceland unfeasible (Ascough et al. 2012) (Fig. 9.3).

Another project more directly associated with volcanism involves the study of the effects of volcanic eruptions on health. A pilot study has recently been carried out in relation to the effects on health of the 1783–1784 volcanic eruption in Laki in south-east Iceland, in particular in relation to fluoride poisoning. The eruption produced the largest amount of lava of any eruption in historical times and was the greatest calamity to affect Iceland since its settlement. The emissions from the fissure decimated the Icelandic vegetation, which, along with acute fluorosis, which is clearly described in contemporary sources, led to the death of most of the livestock over the nine month period of the eruption. A famine swept the country and 10,000 people, or 20 % of the population, died from starvation and disease. Although the effect on livestock was unquestionably greater, there are also contemporary descriptions of bone changes in humans (bony nodules on the ribs and sternum), which could be attributed to fluorosis. The project, which involves palaeopathological and chemical analysis of skeletons of individuals living in the Laki area at the time of the eruption, was instigated by Dr. P. Baxter at the Institute of Public Health at the University of Cambridge and was carried out the Institute of Archaeology, Iceland, and so the research questions are not only associated with the bioarchaeological aspect, but also to further our understanding of the impact on health of such a large eruption. To date, the work has concentrated on trial excavations of cemeteries in the vicinity of the eruption to assess the preservation of the material and how accurately the burials can be dated. Those results have been very promising as in at least one cemetery, Búland, where it is possible to date burials to a very tight time frame, 1783–1845, through the use of tephrachronology (volcanic ash dating, which is widely used in Iceland) (Gestsdóttir et al. 2006a; Gestsdóttir 2011). Recent re-analysis by the author of skeletal remains curated at the National Museum has also indicated that previously excavated

Fig. 9.3 The Eystri-Ásar cemetery in Skaftártunga (seen at the *bottom right* of the picture), on the banks of Eldvatn river, the course of which was changed during the Laki eruption in 1783–1784. The lava from the eruption can be seen on the other side of the river (Photo Peter Baxter)

material has potential for such research with populations showing heavy new bone formation, possibly associated with skeletal fluorosis. As of 2013, this project has been taken up by a Ph.D. student at the University of Iceland.

Due to the small number of people working in the field of bioarchaeology, both Icelanders and visitors, interdisciplinary collaboration features heavily in the work that is carried out in Iceland involving medical doctors, geologists and the field of genetics. Many of the same skeletons were sampled for strontium isotopes and aDNA projects (Price and Gestsdóttir, in press; Helgason et al. 2009), which will give both projects further depth as we will hopefully be able to look at both the geographical origin and biological origin of the early settlers. Genetic research is in the foreground in Iceland. The late settlement of the island, coupled with the relative isolation of the population for most of a millennium and a thorough genealogical record, means it is an ideal population for genetic studies, and this has been utilized by deCODE, a biopharmaceutical company applying its discoveries in human genetics to develop drugs and diagnostics for common diseases. There is already evidence that collaborations between bioarchaeological research and genetics research in Iceland may prove useful for both sides. For example, there has been a lot of work carried out looking at the genetic aspect of osteoarthritis which has found a clear connection between families and osteoarthritis in Iceland. One

Úlfur "skjálgi" Högnason	Björg Eyvindardóttir
845	850

Þjóðhildur Úlfsdóttir	0870
Þorkell "alviðrukappi" Þórðarson	0905
Eyjólfur Þorkelsson	0950
Helgi Eyjólfsson	1000
Ólafur Helgason	1035
Þorvarður Ólafsson	1070
Oddur Þorvarðsson	1105
Áli "auðgi" Oddsson	1140
Oddur Álason	1180 - 1234
Hrafn Oddsson	1225 - 1289
Jón "korpur" Hrafnsson	1255
Sveinn "langur" Jónsson	1280
Jón "langur" Sveinsson	1330 - 1362
Finnbogi "gamli" Jónsson	1360 - 1441
Jón "eldri" Finnbogason	1400 - 1450
Arnfinnur Jónsson	1440 - 1495
Oddur Arnfinnsson	1480 - 1574
Þorgrímur Oddsson	1520 - 1596
Arnbjörn Þorgrímsson	1580
Sveinn Arnbjarnarson	1620
Arnbjörn Sveinsson	1657 - 1706
Guðríður Arnbjörnsdóttir	1692
Jón Eyjólfsson	1726 - 1770
Einar Jónsson	1765 - 1843
Ingveldur Einarsdóttir	1814 - 1851
Einar Gestsson	1843 - 1920
Gestur Einarsson	1880 - 1918
Gísli Gestsson	1907 - 1984
Gestur Gíslason	1946
Hildur Gestsdóttir	1972

Jörundur Úlfsson	0870
Þjóðhildur Jörundardóttir	0900
Leifur "heppni" Eiríksson	0940 - 1020

Fig. 9.4 The relationship of the author to Leifur "the lucky" Eiríksson as demonstrated by the genealogical database available to all Icelanders on www.islendingabok.is (reprinted with permission from Friðrik Skúlason)

such example is the association between osteoarthritis of the hip with families in Árnessýsla in southern Iceland. My PhD research project at the University of Iceland involves looking at osteoarthritis in the skeletal populations in Iceland where there is much higher prevalence of hip osteoarthritis in the skeletal population in Árnessýsla compared to other parts of the country, even dating back to the eleventh century, indicating a certain amount of continuity of settlement (Gestsdóttir et al. 2006b). One of the tools used in the genetic research is a genealogical database, reaching back to the settlement period, although it is accepted that its accuracy diminishes prior to 1703, when the first census was carried out in Iceland, which recorded every single inhabitant's name, age and occupation (Þjóðskjalasafn Íslands 2013). So to end this paper where it started, with the Sagas, Fig. 9.4 shows the author's relationship to Leifur "the lucky" Eiríksson, the first European to visit North America, to emphasize that although we do not take the Sagas literally, Icelanders familiarity with the written past is very much integrated into their lives, and therefore, the way archaeological research is conducted.

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Chapter 10
Human Skeletal Studies in India: A Review

Veena Mushrif-Tripathy

> …… *South Asia remains a vortex of indigenous cultural development into which are swept certain elements of the Western intellectual tradition imported over the course of five centuries. Conversely, the west has sought support for many of its ideas from South Asian written accounts, archaeology, skeletal biology and ecological reconstruction of past events taking place in the subcontinent.*
>
> (Kennedy 2005)

India comprises a huge land mass with a total area of 3,287,263 km^2 (1,269,219 square miles). The northern frontiers are defined largely by the Himalayan mountain range, and it is bounded to the south-west by the Arabian Sea, to the south-east by the Bay of Bengal and to the south by the Indian Ocean. The country, which is a part of South Asia, has evidence of human habitation from the Middle Paleolithic (Table 10.1, Fig. 10.1). Tracing the developments of subjects such as anthropology and archaeology is an enormous task, and the present article is based on a number of earlier review chapters (Murthy 1974; Tavares 1993; Kennedy 2003a, b, 2005; Walimbe 2011a, b). Most of the data presented here are taken from these sources.

The arrival of European colonial powers in late eighteenth century and their curiosity to know about the land and its inhabitants provided the impetus for the start of explorations of different aspects of India. The establishment of geological, botanical and trigonometric surveys by Europeans helped to develop interest in the past. These developments led the foundation of the Asiatic Society in Kolkata by William Jones in 1788, which contributed to the foundation of Archaeological Survey of India in 1861. If we examine the various developmental stages of the subject, we notice that India was at the receiving end of theories that were developed mainly in Europe and were verified, testified and implemented on the subcontinent.

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Table 10.1 Time brackets of different cultures with human skeletal findings from India

Culture	Main regions	Time brackets
Middle palaeolithic homo erectus?	Narmada, Madhya Pradesh	0.15 MYA–40,000 YBP
Mesolithic	Gangetic doab	8000 BC
Harappan culture	North-west part of India, Gujarat	3500–1500 BC
Neolithic-Chalcolithic	Maharashtra, Karnataka, Kashmir	2000–700 BC
Later Mesolithic	Gujarat	2000 BC
Megalithic	Vidharbha, Southern states	1000 BC–2nd century AD
Early historic, medieval and pre-modern	At various places	2nd century AD–17th century AD

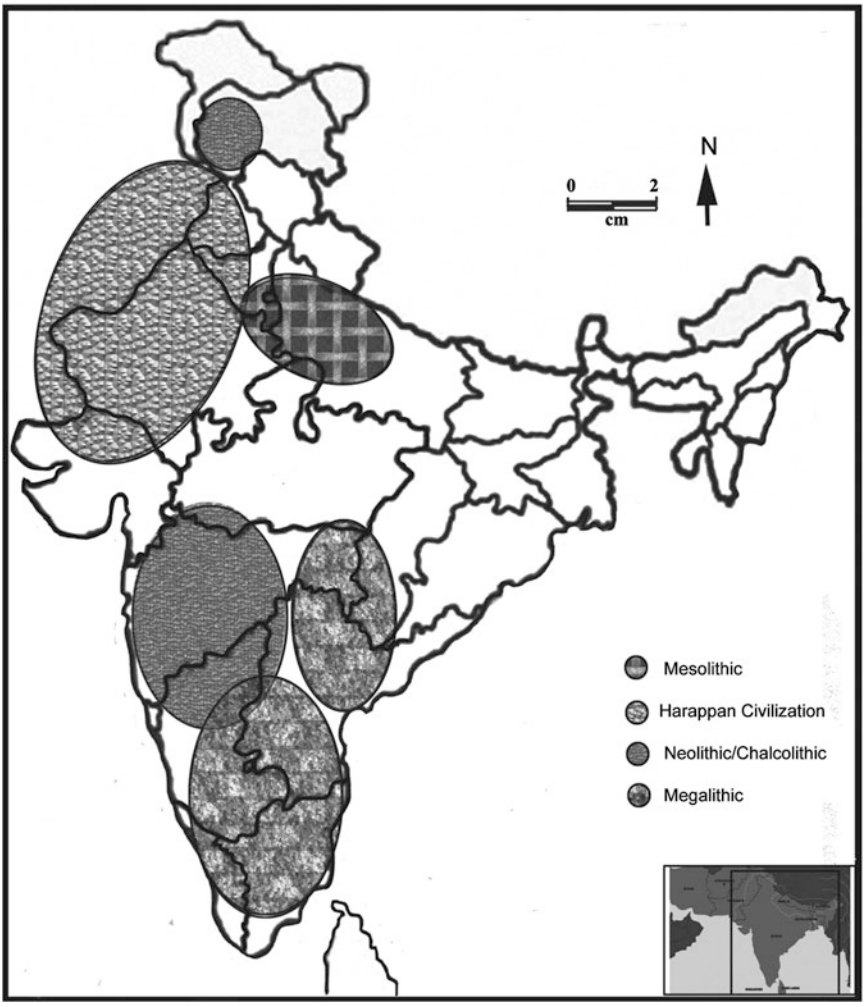

Fig. 10.1 Map of India: geographical distribution of the sites belonging to different cultures

The Era of Discoveries and Racial Classifications

Before the independence of India in 1947 and the creation of the Anthropological Survey of India in 1946, there were many discoveries of human remains from different parts and belonging to various past cultural entities. These discoveries were made and studied by a range of British officials, geologists and enthusiastic amateur explorers/excavators such as Tucker (1846), Taylor (1853), Blanford (1864), Boswell (1872) and Aderson (1883) (references cited in Murthy 1974; Kennedy 2003a). The main focus of these studies was to establish the ethnic identity of the remains, their relationships with contemporary populations and their racial categorization. The cranium was the focal point of discussion and post-cranial bones were collected but only used for age, sex and the stature estimations.

This approach lasted until the late 1970s despite the impact on archaeology of events such as the discovery of the Bronze Age city of Harappa in the 1920s. This was not only a very important discovery in Indian archaeology but also a major event from the perspective of the development of physical anthropology as a discipline in India. Numerous discoveries followed which provided physical anthropologists with many skeletal assemblages for population comparisons. This provided an ideal environment to evaluate theories of migration, diffusions and invasions (Sewell and Guha 1931; Guha and Basu 1938). A 'foreign' population was held responsible or given credit for any new trend or material artefact (mainly during the protohistoric period), rather than ascribing the development to local evolution. At times, foreign invaders were held responsible for the extinction of a culture, and for that reason, it was the necessity to 'classify' the population 'racially' (Walimbe 2011a). British civil servants and Indian anthropologists followed the guidelines of the Biometrika School. Prior to the Second World War, the majority of Indian biological anthropologists who studied abroad received training in Germany. The anthropometric basis for population divisions was not only seen in the colonial mindset, but it was also prominently reflected in the Census of India report in 1931, which was responsible for establishing the model of how the native populations of British India were classified (Guha 1935; Risley 1908). Thus, anthropometry became a very important part of anthropological research in India; cranial shape differences (in the form of dolichocrania or mesocrania) were understood in terms of 'mixing of blood' as well as establishing biological affinities between ancient and living populations on the basis of comparative measurements and morphology.

The Period of Training and Collaborations

This scenario started to change in the 1970s, when processes like adaptation were considered as one of the major factors for population differences. At the same time, concepts such as migration, diffusion and 'mixing of the blood' came under

criticism. The skeletal data were no longer regarded as isolated evidence, but the assemblages were seen in the context of culture. A strong trend persisted though in the use of anthropometric interpretations of population affinities. Many skeletal assemblages were studied during this period at the Anthropological Survey of India and Deccan College Post-Graduate and Research Institute, Pune, two prime places for skeletal studies.

At this stage, it is important to know the role of Indian anthropologists and their foreign collaborators who created a niche for human skeletal studies in Indian archaeology. Under the guidance of Prof. Iravati Karve, an anthropologist at Deccan College, studies of human remains started around 1945. She strove to understand biological variation in extant populations. At the same time, the archaeology department excavated a few sites (e.g. Chandoli, Nevasa, Langhnaj, Mahujhari and Baghor) which yielded skeletal remains. The archaeology department also began a collaboration with Prof. K. A. R. Kennedy of Cornell University in the USA. He studied some skeletal assemblages in collaboration with S. Ehrhardt, a German anthropologist (Ehrhardt and Kennedy 1965). Kennedy encouraged his students to study skeletal findings, while at the same time he also trained his Indian colleagues in different methodologies. Dr. Karve encouraged one of her students, Dr. K. C. Malhotra, to conduct human skeletal studies, and this resulted in a number of publications on the Nevasa human skeletal remains (Kennedy and Malhotra 1966; Malhotra 1965, 1967, 1971).

Beyond Dry Bones: Scenario of 1980s and Forward March

During the early 1980s, skeletal studies gained a new importance within the field of Indian archaeology. Concepts such as adaptation, growth and nutrition and their effects on the skeleton were better understood, and these criteria were used for understanding ancient populations. Models from social anthropology and ethnographic studies on health helped to understand the changes in human body due to different aspects including diet, diseases, infant mortality, life expectancy. This 'biocultural' approach is where skeletal remains are understood as reflecting past societies and not just bundles of bones.

Earlier studies focused only on the human skeletal remains of adults resulting in small samples for understanding the nature of populations. During the 1980s, subadult individuals were incorporated in the analysis. Fragmented bones were also considered for analysis. This resulted in a drastic increase in numbers of individuals available to represent the extant population. The questions of infant mortality rates, age of weaning, the role of infections and malnutrition were prioritized. At the same time, the publication of the edited book '*Palaeopathology at the Origins of Agriculture*' (Cohen and Armelagos 1984) had a major impact on skeletal biologists all over the world.

Deccan College played a prominent role in the development of the subject (Walimbe 2007a). This is only university in India where the post of lecturer was

created in the field of skeletal anthropology at an archaeology department. A laboratory was established for the same purpose from 1980. The research goals of the Anthropological Survey of India shifted from skeletal analysis to projects like 'People of India' which has the biggest human skeletal repository of ancient and modern populations from different regions. As a result of these developments, anthropological research for the last two decades was primarily remained confined to the Deccan College where ancient skeletal assemblages are kept and studied. In India, the subject was developed by Prof. S. R. Walimbe (retired professor, University of Pune). He was associated with Deccan College for a long time and initiated the establishment of the anthropology lab at the College. He has studied more than 40 skeletal assemblages from different sites (Walimbe 1986, 1990, 1994, 1998; Lukacs and Walimbe 1984); (Walimbe and Selvakumar 1998) and (Walimbe and Paddayya 1999). The complete list of work is available at www.adimanav.org. This remains the only working laboratory in India dedicated to work on skeletal anthropology. The present author has worked on many skeletal remains from India and is trying to implement new technologies to improve the subject at the same department (Mushrif and Walimbe 2006; Mushrif et al. 2008; Robbins et al. 2009; Mushrif-Tripathy et al. 2011; Mushrif-Tripathy and Walimbe 2012; Robbins et al. 2006, 2007; Jonnalagadda et al. 2011, etc.). Allahabad University also invited foreign collaborations (Walimbe 2011a) and understood the importance of human skeletal remains.

A few unsuccessful attempts were made for extracting Ancient DNA, as outlined in a chapter published in the American Journal of Physical Anthropology (Kumar et al. 2000). The authors concluded that 'there is insufficient DNA surviving in Indian specimens for analysis from tropical environments', and they also suggested that samples should be collected from sites in non-tropical environments and/or cave sites (Kumar et al. 2000 pp. 132). This situation has changed recently. Collaboration between Deccan College and CCMB (Centre for Cellular and Molecular Biology, Hyderabad) has given a positive result in studies on archaeological DNA. A 'state-of-art' ancient DNA laboratory facility has been created in the premises of CCMB. Studies undertaken in this laboratory on the human remains from Roopkund, a glacial lake in Uttarakand, mark the first ever successful attempts of isolating ancient DNA in this part of the world (Walimbe 2007b).

There are many foreign investigators who directly or indirectly helped the growth of the subject in India. As mentioned earlier, K. A. R. Kennedy was among the first external scholars to engage with the subcontinent, followed by his student J. Lukacs (retired professor from University of Oregon, Oregon). They established new palaeodemographic trends in skeletal and dental research. Dr. Diana Hawkey, another student of Kennedy, worked extensively on the dentition of Indian samples (Hawkey 2002). Lukacs's students B. Hemphill (California State University, Bakersfield) and G. Robbin-Schug (Appalachian University, Appalachian) also worked on Indian material. Robbin-Schug is currently working on a project involving Harappan skeletal remains.

Recent approaches have become more scientific in nature, but at the same time, the disciplines seek many explanations from sociological and cultural angles. This

Fig. 10.2 Some of the pathological changes encountered in remains from India

change in research strategies is reflected in two major ways. One is understanding the role of 'continuous' metric and 'discrete' non-metric (morphological) traits, their relevance in population movements and assessment of micro-evolutionary changes, particularly those seen in at the transition to agriculture; and secondly, in the field of palaeopathology where cultural aspects have become more important and instead of 'what is it?', the quest now is for 'why and how is it there?'.

Palaeopathology has become a centre point as it reflects physiological stress and health during adaptation to different subsistence strategies, economies and environments. Occupational stress markers on skeletal remains indicate the life ways of the population. The presence of maxillary sinusitis, vertebral arthritis, clavicular bone changes, squatting facets on the tibia, dental abrasions and wear patterns are some of the common indicators of habitual activities and disease (Fig. 10.2). India still has some pockets where people are living using primitive technologies. These ethnographic parallels also hint at the health hazards of the bygone population. Unhygienic conditions, repetitive pregnancies and low-nutritious diets in present societies give an indication of past vulnerabilities in terms of malnutrition, high infection rates and increases in child mortality rates.

There are also attempts to incorporate the details from ancient Indian texts to understand bygone societies. These texts contain information about mortuary practices, general life of the people and also pathology. Texts like *Atharvaveda* (around 1200 BC) discuss various health problems and associated remedies, from medico-magical perspectives. *Sushruta samhita* (fifth century AD) deals with surgeries, and *Ayurveda* is very popular even today for its healing capacity.

The 'Aryan Invasion' and Indian Anthropology

While debunking the 'Aryan invasion theory', Walimbe (2011a: 324) discussed how the concept of an Indo-Aryan group of people and their 'invasion' has played a prominent role in explaining the cultural history of the Indian subcontinent. This concept can be traced back as early as the nineteenth century, when Max Mueller (1867), thrilled by the complexity of Indian culture, used the word 'Aryan Race' and thus emerged an imaginary creature 'Aryan Man'. Borrowing from earlier ideas about Aryans in Europe, he propounded the theory that the group invaded the Indian subcontinent around 1500 BCE, later settled in India and that they were the people who destroyed the big cities at Harappa and Mohenjo-daro.

The discovery of Harappa and Mohenjo-daro in 1920s was a very crucial moment from an anthropological point of view. These are huge cities located on the north-west of India that provide early evidence of urbanization. Other than these sites, Chanhu daro, Kalibangan and Lothal show uniformity in their architectural and pottery assemblages and together have been named as Harappan civilization or Indus civilization which flourished from 3000 to 1500 BCE. Around 1500 BCE, there is archaeological evidence indicating the sudden decline of this civilization. This was a big question to address. At Mohenjo-daro, the excavators encountered disarticulated skeletons on roads and in other parts of the city rather than in cemeteries (Fig. 10.3). Many skeletons were either disarticulated or incomplete. Sewell and Guha (1931) attributed plague, famine and 'sudden' events as causes of death. Guha and Basu (1938) suggested that these individuals had been slain by raiders while attempting to escape from the city during a military attack. Several disassociated causes, including the enigmatic absence of a formal mortuary area at the site, were taken as supporting evidence for this 'massacre', and this idea was immediately seized upon as awful proof of the invasion of the subcontinent by the 'Aryans'. Wheeler (1968), while accusing the Aryans of destroying the cities of the Harappan civilization and for the 'massacre' at Mohenjo-daro, cited the Vedic texts describing that the 'Aryan' were brave, efficient and dreadful warriors who knew the bow-and-arrow; that horses were used to pull their chariots; and that they were protected by armour and shields (Walimbe 2011b).

As a result, skeletal analysis of these remains focused on answering questions related to identity including: who were these people and where did they come from? Craniometric data were used to classify and justify the 'foreign element' within the population. The first concise and well-documented report on the skeletal material from Harappa and Mohenjo-daro was by Guha and Sewell in 1931. In 1935, Guha (1935, 1944) recognized four racial groups while describing the Mohenjo-daro population, which he labelled as Mediterranean, Proto-Australoid, Alpine and Mongoloid. This classification became the basis for future studies involving the analysis of skeletal assemblages from different sites. In 1962, Gupta, Dutta and Basu restudied the skeletal findings from Cemetery R-37, Area-G, Area-AB and Cemetery-H at Harappa and classified them into similar categories. According to

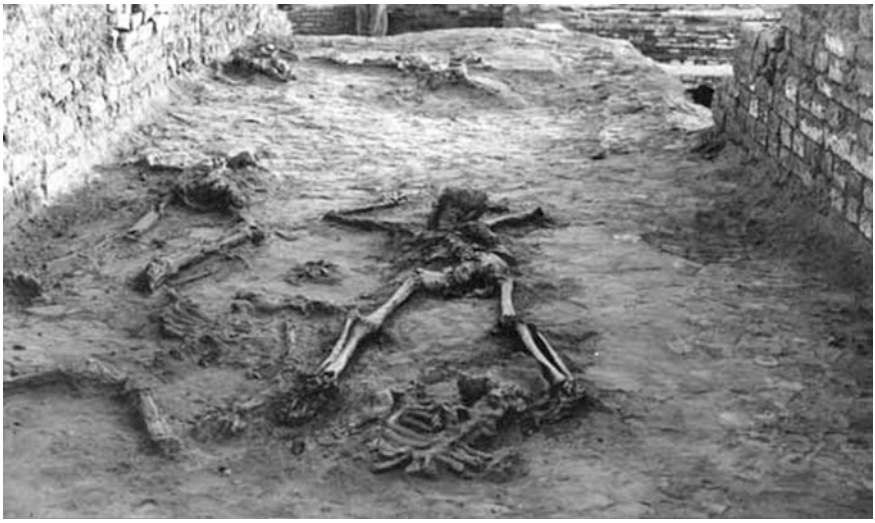

Fig. 10.3 Non-formal disposal of human remains at Mohenjo-daro (from published data)

this latter study, the presence of long-headed (dolichocranial) people was noted in all areas, whereas the round-headed or brachycranial population was only seen in Area-G, concluding that this was a new type.

There have been more recent attempts to understand differences seen in the Harappan population. Many physical anthropologists have studied Harappan crania (e.g. Hemphill et al. 1991, 1997), and Kennedy (1995) came to the conclusion that there is not much evidence to prove the presence of a foreign element in Harappa. Kennedy (1995: 54) mentioned that 'our multivariate approach does not define the biological identity of an ancient Aryan population, but it does indicate that the Indus Valley and Gandhara peoples shared a number of craniometric, odontometric and discrete traits that point to a high degree of biological affinity', thus completely denying the theory of 'Aryan invasion'. With new advances in studies and re-evaluation, no significant phenotypic differences in the population have been found, and even though the Harappan skeletal assemblages come from different deposits, they appear to belong to one homogeneous group. As these assemblages come from Harappan cities, the variation in size and shape can be explained with migrations and immigrations of different population from surrounding areas. As these cities had huge trade networks with other parts of the region, it is possible that many merchants or traders may have travelled to these locations.

The so-called invasion is also called into question from a palaeopathological point of view. A number of studies considered evidence of trauma in the disarticulated skeletal remains from Mohenjo-daro. Dales (1964, 1965) noted that the skeletal collection he studied and that examined by Marshall and Mackay in the 1930s (see above) did not represent a single archaeological time frame. The temporal and cultural contexts of these remains are uncertain, and it may not be

sound to consider them evidence relating to a single tragic episode. Dales (1964) also pointed out that on purely chronological grounds, no definite correlation between the end of Indus civilization and the 'Aryan invasion' can be established. The Harappan skeletal collection was restudied by Kennedy (1984, 1994) in the light of the new methodological approaches in the field of forensic anthropology and palaeopathology. He offered a very critical judgement of earlier narratives. He stated that 'when present, marks of injury are quite specific in their appearance, both microscopic and macroscopic analyses revealing tell-tale features which are not to be confused with abrasions or other marks of erosional and post-mortem origin….To be sure, individuals victimized by trauma may not bear the marks of their assailant or his weapons on their skeletal tissue (as with cases of drowning, strangulation, poisoning, cardiac arrest due to fright, etc.); but in cases of genocide (like military engagements, mass executions, ritual sacrifices) where multiple victims are involved it is usual for some individuals of a group to reveal marks of traumatic stress on their bones and teeth' (Kennedy 1984: 427). Death by an axe or sword may not be registered on the bone if the wound is superficial and if only soft tissues are injured. But it is reasonable to expect actual wound marks in case of unceremonious slaughter, which are not present in Mohenjo-daro specimens.

The proposition of a traumatic end of Harappan culture (Mohenjo-daro in particular) is based essentially on archaeological evidence of the disorderly disposal of the dead rather than on skeletal evidence of trauma. In this case, the problem of interpreting the disarray of skeletons becomes more complicated. This haphazard mode of disposal of the dead might have had some social implications rather than being solely related to violent events. Anthropology or archaeology has no conclusive answer to this puzzle at present. It may be mentioned that some scholars believe that the Mohenjo-daro individuals exhibit a unique pattern of regional phenotypic variability with striking differences that set them apart from skeletal series at other Harappan sites. It has been claimed that the skeletons in question may belong to a post-Harappan period and share no direct biological affinity with the population of the mature Harappan phase (Gadgil and Thapar 1990; cited in Walimbe 2011b).

To strengthen the 'no Aryan Invasion' hypothesis, data from human population genetics generated in recent years show that there is no material evidence for any large-scale migrations into India over the period of 4500–800 BCE. On the basis of the presence of sublineages of U2 frequencies (U2e and U2i), Basu et al. (2003) argue that Aryan speakers possibly came into India in small bands over a long period of time, as opposed to in a single wave of migration.

Peopling of the Indian Subcontinent

India is very interesting country when it comes to diversity, where huge biological and cultural variability can be seen in living populations. As pointed out by the 'People of India' project of the Anthropological Survey of India, there are 4,694

living communities in India (Singh 1998). According to linguistic studies, there are around 325 languages divided into four 'language families', namely Austic (Austro–Asiatic), Dravidian, Indo-European and Sino-Tibetan (Pattanayak 1998). Several attempts have been made to describe and explain these variations. Some claim indigenous origins for these diverse groups while a few other scholars attribute a considerable fraction of this variability to the large-scale migration of people at different time brackets (Walimbe 2007c; Walimbe and Mushrif 2007).

According to Gadgil et al. (1998), the Indian subcontinent has been populated by successive waves of peoples with knowledge of new technologies. The likely migrations according to this theory include:

1. Austric language speakers came soon after 65,000 ybp from north-east
2. Dravidian language speakers around 6,000 ybp from the Middle East bringing knowledge of cultivation of crops like wheat along with the domestication of cattle, sheep or goats
3. Indo-Europeans in several waves after 4,000 ybp introducing horses and iron technology
4. And the forth one, Sino-Tibetan speakers in several waves after 6,000 ybp bringing with them knowledge of rice cultivation.

Other than the first migration, the rest of these migrations occur in the proto-historic period from where the maximum numbers of skeletal remains are available in India. To understand present population affinities, it is essential to understand the peopling of India from ancient times. In this regard, skeletal assemblages are important. As discussed earlier, the skeletal evidence has been used in attempts to solve the 'Aryan invasion' question. But at the same time, there are certain limitations to the use of anthropological and archaeological data to understand population migration and dispersals. In addition, linguistic and other biological tools such as MtDNA and Y chromosome DNA are required to explain plausible scenarios in the process of the peopling of the subcontinent (Walimbe 2011a).

As noted above, 'ethnic' or 'racial' identity was drawn from three cranial indices, namely the cranial, facial and nasal index, which were inadequate to document the affinities in populations. In recent years, emphasis has been placed on traits where there is strong genetic component, with little to no sexual dimorphism, having low susceptibility to environmental changes and lacking age-related morphological changes. The best example of this change in research strategy is seen in Hawkey's study (2002), where examined the population affinities of protohistoric populations in the Indian subcontinent. She analysed 29 dental morphological features which characterize possible genetic affinity, using a large sample size of 4,198 individuals. Walimbe and Mushrif (2007) and Walimbe (2011) summarized the major conclusions of her research as follows.

1. The Indus and Deccan farming/herding communities share similarities with Indian Mesolithic hunter-gatherings reflecting a common origin for the protohistoric communities.

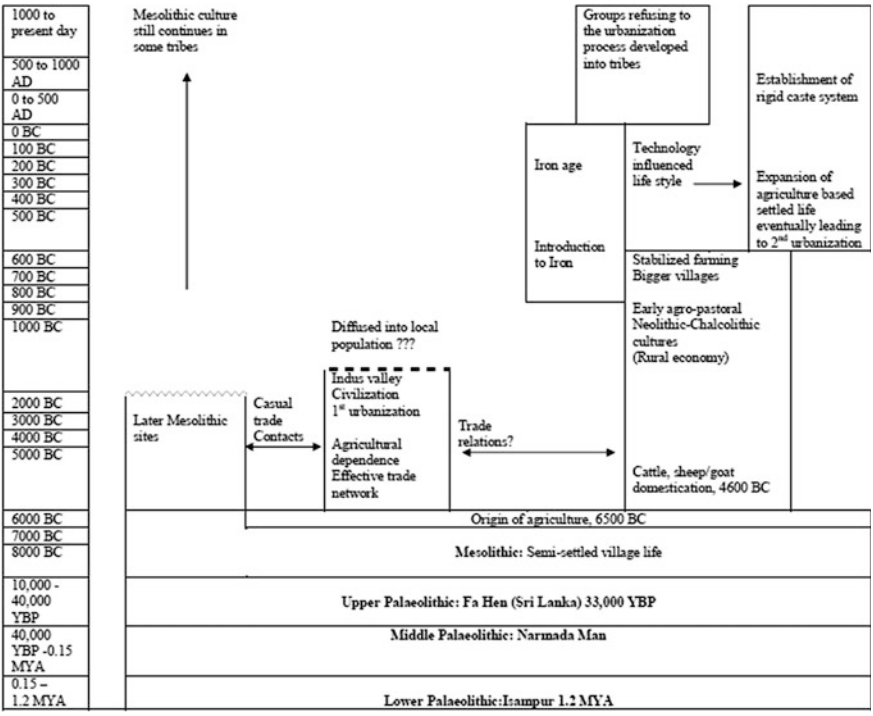

Fig. 10.4 Cultural relationships defined by using physical anthropological data (from Walimbe 2011)

2. There is no substantial gene flow between the Indus and the Deccan farming/hearding communities, indicating the Deccan Neolithic-Chalcolithic groups have evolved directly from the hunting-gathering Mesolithic communities and not from Indus population.
3. Data suggest the origins of the Iron Age populations within central and southern peninsular India and not from north-western regions.
4. The Iron Age and the early historic populations of the Deccan are dissimilar to the contemporary populations from both the north-west and the Indo-Gangetic regions. They, however, maintain affinity with the farming/herding groups of the Deccan. The lack of a closer relationship between the Iron Age/Early Historic populations of the north and Deccan suggests that gene flow between the two regions was disrupted in some manner, possibly due to the adaptation of the vedic caste system and marriage prohibitions after the urbanization process which may have helped produce distinctive regional dental patterns

Reliable and non-adaptive bodily features need to be used in taxonomic studies on skeletal or living populations. Also, the archaeological evidence needs to be re-evaluated independently without linguistic biases. Molecular knowledge can be applied to improve understandings of population movement in the past. The

approach thus demands proper synthesis of genetic, archaeological and anthropological data (Walimbe and Mushrif 2007). Walimbe (2011a, 330) has provided a graphic illustration of cultural continuity on the basis of physical anthropological data from the Indian subcontinent (Fig. 10.4).

I will finish with comments about new trends in Indian palaeoanthropology. Pathological changes not previously documented are being identified in the remains, and new aspects are been added to their interpretation. Ancient Indian literature is also taken into consideration to further our understanding of earlier populations.

New techniques such as isotope analysis, ancient DNA, identification of occupational stress markers on teeth and bones are being used. There are recent studies where strontium and lead are being used to characterize ancient migration, especially among non-adults. The characterization of palaeodiets through chemical analysis and the recording of dental morphological traits are also included in these analyses. At the same time, more and more skeletal assemblages are being analysed from these scientific perspectives.

The present generation of Indian physical anthropologists seeks collaborations with social anthropologists, archaeologists, geneticists, linguists and medical professionals in order to further the development of the subject.

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Chapter 11
The Development of the Contextual Analysis of Human Remains in Ireland

Barra O'Donnabhain and Eileen Murphy

Colonial Background

Ireland is somewhat atypical among its immediate neighbours. While most western European countries were imperial powers during recent centuries, Ireland was an imperial subject. The colonial experience has been a dominant factor in the production of culture in Ireland, including narratives of the past. Kabbani (1986: 6) has argued that 'the ideology of Empire was hardly ever a brute jingoism; rather, it made subtle use of reason, and recruited science and history to serve its ends'. In the context of nineteenth century British imperialism, physical anthropology and archaeology were just two of a number of scientific discourses recruited to legitimise colonialist policies. As was the case in other colonial enterprises, legitimation was in part provided by racialised conceptualisations of local populations in both past and present. In Ireland, an indigenous population that was white presented challenges to British colonial discourse, but these were overcome partly by recourse to the racial contrast between Anglo-Saxon and Celt (O'Donnabhain 2000). The significant English and Welsh contribution to the Irish population since the twelfth century was also problematic, but this was overcome in the post-Reformation reconquest of the island by using the adherence to Catholicism as a means of conflating the aboriginal Irish with the Old English: descendants of medieval settlers who were characterised as having succumbed to the native culture of Ireland (Gibbons 1991). These sectarian and racialised conceptualisations of the population of Ireland were largely the construction of the British, the metropolitan ruling power, with a secondary role played by descendants of sixteenth and seventeenth century Protestant settlers from Britain. Despite an increasing identification with

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Ireland in the later eighteenth century, this Anglo-Irish settler élite had a vested interest in maintaining imperial links and ideational systems. One of the early cultural institutions associated with this colonial ruling class that encouraged archaeological and physical anthropological research was the Royal Irish Academy, founded in Dublin in 1785. By the mid-nineteenth century, the academy was displaying archaeological artefacts, including human remains. This collection was initially catalogued and curated by William Wilde (1815–1876; see also Chap. 6 by Brothwell) and was to become the core around which the National Museum of Ireland developed in the early twentieth century (Harbison 2003). Drawing on narratives from medieval sources, the Anglo-Irish developed versions of the Irish past that emphasised discontinuity by focusing on the theme of recurring invasions. Among other things, this explanatory construct served to naturalise the dispossession by their own ancestors of earlier élites and a social system where a small minority owned almost all land and controlled most of the wealth.

British ideas about Ireland were framed in a broader context of imperial expansion. In the latter half of the nineteenth century, notions of sociocultural evolution provided the ideological underpinning for colonial adventures outside Britain and for justifying the political and social status quo at home. Sociocultural evolutionism was understood to support a view of the past where certain populations or subsets within these had acquired bigger brains that facilitated an accelerated level of cultural progress. Other groups had remained in a primitive, ancestral state so it was held that certain contemporary societies or cohorts of society reflected earlier stages of human development (Stocking 1987). Within the context of the Victorian British state, social categories such as criminals, working-class women and the Irish were often equated with 'savages' or 'primitive men'. This was understood to be demonstrable through 'science'. Specifically, Blumenbach's racial typology of crania provided a biological means of categorising populations and the cephalic index developed by the Swedish anatomist, Anders Retzius (1796–1860), provided a means of comparing both living and dead groups. Retzius had acquired Irish skulls from William Wilde (MacKenzie 1910). One of the earliest applications of the cephalic index involving human remains from Ireland was in Davis and Thurnam's *Crania Britannica* (1860), in which the Irish data were subsumed with those from the neighbouring island, ignoring any contextual differences. Comparative anatomy was also seen to reinforce Victorian ideas of Irish populations as evidenced by the work of John Beddoe (1826–1911). Beddoe (1870) reported how he had developed an 'Index of Nigrescence' to chart racial differences (for another perspective on Beddoe, see Chap. 6 by Brothwell). Beddoe concluded that the Irish were of mixed race and had a high index of nigrescence. Beddoe, along with Francis Galton, played important roles in the establishment of the short-lived Dublin Anthropometric Laboratory (1891-c. 1900) located at Trinity College (O'Donoghue 2010). The laboratory was established with the contrastive aims of testing the mental capacity of the university students (then almost exclusively of Anglo-Irish descent) while also investigating the different racial types argued to be found on the west coast of Ireland.

The attitudes and methodological approaches of people like Beddoe are typical of Victorian British approaches to Ireland and would be of little interest were it not for the fact that the racially motivated models they constructed had a lasting influence that can be traced into the twentieth century and possibly the twenty-first. In 1910, for example, MacKenzie argued that ancient skulls from Ireland show a mixture of primitive British, Scandinavian and Iberian types. The presence of each of these types was explained in reference to medieval pseudohistory while regional differences within Ireland were explained in terms of a hierarchy of primitiveness. Those perceived to be most primitive were to be found on the west coast, farthest away from Britain. This particular construct that the population of the west of Ireland was a relic of earlier, primitive groups is a recurring theme in the literature of the physical anthropology of Ireland. In the same decade that MacKenzie's volume was published, university departments of archaeology were established in four of the five universities on the island. However, there was very little engagement with archaeologically retrieved human remains in the work of these departments. This was primarily due to an inheritance from British academic traditions where physical anthropology was located within departments of anatomy (see Chap. 6 by Brothwell).

Partition and Divergence of Approaches

Radical political changes occurred in the 1920s that impacted on the production of narratives of the biology of past and present. A little over 80 % of the island of Ireland achieved independence in 1922 while the remaining portion became a self-governing province within the United Kingdom. Perhaps not surprisingly given the narratives developed in the nineteenth century, the partition of the island was justified on the basis of sectarian and racial differences. In Northern Ireland after 1922, archaeology was enlisted as a means of identity formation and rapidly produced archaeological and thinly disguised racial narratives that stressed the distinction of the newly partitioned province from the rest of the island while emphasising the deep antiquity of linkages with Scotland (Stout 1996). Racialised notions of the Irish population were also embraced by southern Irish nationalism even though this involved internalising ideas of biological difference with nuances of otherness, subordination and inferiority that had their origins in Victorian Britain. After independence, the development of archaeology and physical anthropology in southern Ireland took a different course from that in Britain or Northern Ireland as successive governments of the new state deliberately avoided looking to Britain for scientists to fill key posts in cultural institutions.

This changed political context is reflected in the two major typological studies of the Irish population that were undertaken during the early 1930s. The first was carried out by an anatomist, Cecil Martin, who was drawn from the colonial ruling élite of the pre-Independence era while the second was directed by Earnest Hooton under the aegis of the Harvard Anthropological Mission to Ireland of

1932. Martin's work was based on cranial metrics and in keeping with earlier conceptualisations of the Irish, he argued that the population was relatively undisturbed by the factors that were thought to have shaped the pattern of racial variation seen in Britain and continental Europe (Martin 1935). In particular, the west of Ireland was again understood to have preserved some pristine or ancient racial type that has been lost or diluted elsewhere in Europe:

> It appears probable that the remnants of very primitive peoples may have reached this land and persisted there, simply on account of the remoteness of the land. Strains of these very early people may even still persist among the modern population, just as we find strains of primitive people along the western shores of Africa…where they were driven into a similar cul-de-sac by later invaders coming from the east (Martin 1935: 3).

Hooton's racial analysis of the Irish was considerably more sophisticated and dealt primarily with living subjects (Hooton and Dupertuis 1955). Cranial and other metrics were obtained from thousands of people (mostly men) from all parts of the island, including Northern Ireland. Like Mackenzie, Martin, and others, Hooton uncritically accepted narratives from medieval pseudohistory that Ireland had been subjected to multiple incursions by different peoples, understood by Hooton to represent different racial types. Hooton's voice was as authoritative in Ireland as it was elsewhere, and his conclusions were influential. He used sectarian difference as one of the principal means of organising the survey data: comparing Catholics with Protestants. This racializing of the religious divide in Ireland was not new, but Hooton's results served to strengthen the perception of perceived differences as being 'proven' by 'science'. In most of his major conclusions, Hooton recapitulated many of the nineteenth century colonialist concepts of the Irish, including the racial primitivism of some of the population, with the population of the south western seaboard characterised as 'upper palaeolithic people'.[1]

Impacts of the New Physical Anthropology and the New Archaeology

By the time of the publication of the Harvard study in 1955, significant changes were occurring in physical anthropology that curtailed morphological studies devoted to the identification of racial types (e.g. Washburn 1951). The abandonment of physical type resulted in an inertia in approaches to ancient human remains in Ireland, and the typological study published by McLoughlin (1950) was the last significant analysis of large archaeologically derived skeletal collections to

[1] It was noted in the same sentence that this was "the part of Ireland from which the Irish in America are mostly derived" (Hooton and Dupertuis 1955: 239). The expedition may in part have been motivated by a need to understand this group more fully as Hooton stated in his preface that "Here in Massachusetts we live among Americans of Irish extraction; …most of the time we are governed by them" (Hooton and Dupertuis 1955: 5).

be undertaken on the island until the 1980s.[2] This inertia was also reflected in the archaeology departments on the island where up until the 1970s, cultural change in Irish prehistory was being explained in terms of the displacement of long-headed early Neolithic groups by more advanced round-headed peoples (e.g. Herity and Eogan 1977). In doing so, these institutions were unwittingly perpetuating earlier colonial racialised narratives of the past.

Between the 1950s and 1980s, what little analysis of archaeological human remains that did occur was carried out by anatomists, and while some small reports appear as appendices to articles within journals such as the *Journal of the Royal Society of Antiquaries of Ireland* and the *Ulster Journal of Archaeology*, most of this work was never published. It was acknowledged by some archaeologists that this situation was unsatisfactory. In the mid-1970s, Professor MJ O'Kelly of University College Cork noted with some exasperation that in the previous decade, he had reburied a collection of protohistoric skeletons without analysis because he was unable to access the appropriate expertise. It was during that decade that the impact of the New Archaeology began to be felt in Ireland and one outcome of this was the first serious questioning of the hypothesis of recurring invasions that had dominated Irish archaeological discourse since the nineteenth century (Waddell 1978). At the university in Cork, O'Kelly was instrumental in inaugurating further change in the early 1980s when environmental archaeology was added to the curriculum which now included some osteology-related teaching. The primary focus was with faunal remains, but some attention was also paid to archaeological human remains. O'Kelly facilitated students seeking postgraduate training in the USA and undertaking research degrees in bioarchaeology and palaeopathology (Power 1984; O'Donnabhain 1985). This pattern of seeking training abroad continued through the 1990s and into the new millennium when a second wave of students trained primarily in Britain (e.g. Murphy 1994). As a result of these external linkages, two academic lineages dominate praxis in Ireland: that of the North American bioarchaeology (specifically the 'anthropological question' tribe: see Chap.16 by Rakita) and the British human osteoarchaeology. Coincident with the curricular developments in Cork in the early 1980s, environmental archaeology also made a significant impact in Northern Ireland during the 1970s and 1980s with Queen's University Belfast also becoming an important centre for palaeoenvironmental research.

Recent Decades

Since the early 1990s, the increase in fully trained archaeologists with expertise in bioarchaeology has brought a new vigour to the study of ancient human remains in Ireland and a significant increase in publications has occurred over recent decades.

[2] Hooton's student, W. W. Howells, published a typological study of a medieval assemblage (Howells 1941), and these data were subsequently used by Giles and Eliot (1963) in their research into metrical methods of sex determination.

These have included publications in general-reader journals, particularly *Archaeology Ireland* which has also been a venue for the publication of numerous articles concerning case studies in palaeopathology. These articles have helped to raise the profile of the study of archaeologically retrieved human remains within Irish archaeology and with the general public.

In 1999, the Heritage Council (a statutory body established to advise the Irish government on issues related to natural and cultural heritage) commissioned a study on all aspects of human remains in Irish archaeology. This found that there is a generally positive view across all sectors of Irish society of the work of archaeology and recognition of the value of the excavation and study of archaeological human remains (O'Sullivan et al. 2002). One point of departure between those in heritage-related professions and the general public was on the long-term curation of remains, though demands for reburial of archaeological human bone are relatively rare. When early modern remains, from children's burial grounds or workhouses, for example, have been excavated in advance of development, the National Museum of Ireland has negotiated with local communities regarding the reburial of these emotive assemblages. Similarly, in Northern Ireland, excavations on Church of Ireland sites generally have involved an agreement that the human remains will eventually be reburied following completion of scientific analyses.

In addition to general-reader articles, a number of papers on Irish skeletal material have appeared in academic publications. These have included palaeopathological case studies as well as a number of synthesis papers on topics such as diet, tuberculosis, trepanation, leprosy, scurvy, children's burial grounds, identity, mobility, past violence and isotopic studies. There was a resurgence of interest in the population history of Ireland at the turn of the millennium, mostly as a result of a government-funded project entitled 'Irish Origins: The Genetic History and Geography of Ireland' (e.g. Hill et al. 2000; O'Donnell et al. 2002). This included DNA research based on abstracting backwards from modern populations. Ancient DNA work on human bone has been less successful though recent collaborations between researchers at University College Dublin and Trinity College Dublin are promising. The composition of past populations has been approached through the study of morphological variability (O'Donnabhain and Hallgrímsson 2001, 2013). Some of the early work by geneticists provoked considerable controversy in that simplistic and naïve approaches to archaeology have resulted in the resurfacing of older narratives rooted in colonialist images of the past (e.g. Bodmer 1992). Again, the population of the west of Ireland has been characterised as a relic of early waves of prehistoric colonisers of Western Europe (Zschocke et al. 1997). Physical anthropologists have also fallen into similar traps through cavalier attitudes to context: a 1995 study that reanalysed Hooton's data included a cursory review of the cultural background that was rooted in nineteenth and early twentieth century conceptualisations of the archaeology of Ireland (Relethford and Crawford 1995). Not surprisingly, this led to interpretations that replicated older narratives that are rooted in racially motivated colonialist fantasies. This lack of appreciation of cultural context has also hampered some recent health-related syntheses where it has been considered appropriate to amalgamate data derived from Irish

populations with those derived from neighbouring Britain despite the significant differences in the archaeological records of the islands for most periods of the past. The dangers of this decontextualised approach have been highlighted by a Ph.D. project recently completed at University College Cork that has demonstrated significant regional differences in patterns of non-specific stress both within and between the two islands (Tesorieri 2014).

Recent decades have also seen the development of a number of forums for bioarchaeologists working in Ireland. This began in 1992 with the formation of the human and animal remains discussion group (HARDG). During the final years of the 1990s, the huge growth in developer-funded excavation led to a quantum increase in the volume of human remains being excavated. Questions concerning sampling strategies, curation and best practice regarding human remains led to the formation of the Human Osteoarchaeological Sub-committee of the Irish Association of Professional Archaeologists (IAPA), who produced a guide for the wider profession outlining best practice in relation to the excavation of human remains (Buckley et al. 1999). With the objective of continuing the work of these groups, an Irish Section Newsletter of the Palaeopathology Association was developed in 1998. The newsletter was produced annually up to 2009 and was an attempt to enable communication among the growing number of bioarchaeologists working on Irish material, while also reaching a wider audience. In 2006, the Irish Association of Professional Osteoarchaeologists (IAPO) was established with the aim of promoting communication and providing support and education for professionals working in the field of bioarchaeology in Ireland. The economic downturn that began the following year had a devastating impact on contract archaeology in Ireland. This has led to many bioarchaeologists having to seek employment elsewhere, and there has been a loss of talent as a result.

More positive developments include specifically bioarchaeological projects such as the Spike Island Archaeological Project and the Ballyhanna Research Project. The former is a collaboration between University College Cork and the Institute for Field Research and explores a nineteenth century convict prison and associated cemeteries. The project is run as a field school, combining research excavation with education in field methods and bioarchaeology in a fieldwork model that is increasingly used in Ireland. The Ballyhanna Research Project is a collaboration between the National Roads Authority, Queen's University Belfast and the Institute of Technology, Sligo. This cross-border initiative has resulted in the funding of a PhD and two MSc projects (later upgraded to PhD projects) which involve the study of 1,000 Late Medieval skeletons recovered from Ballyhanna, Co. Donegal. Cross-border collaborations are a reminder that two legal jurisdictions exist on the island of Ireland. There are legal controls on archaeological excavations on both sides of that border. Excavations can only be carried out with the permission of the respective government heritage services. However, there is a significant difference in the legal status of archaeological human remains between the jurisdictions. In the Republic of Ireland, archaeological human remains have been explicitly recognised as archaeological artifacts since 1994 and are therefore the property of the state with the National Museum of Ireland charged with their

protection and curation. Destructive analysis cannot be carried out without permission, nor can remains be exported without a licence. In Northern Ireland, archaeological human remains are the property of the landowner. Fortunately, since the early 1990s, it has become standard practice in both jurisdictions that archaeological human remains are subject to bioarchaeological analysis. While numerous skeletal reports have been published as components of excavation reports, or as publications in their own right, one of the biggest problems remains the poor record of publication of excavations. Unfortunately, this problem has direct repercussions for bioarchaeologists, and the published record currently represents only a fraction of the bioarchaeological analyses that have been undertaken. This problem has been addressed in recent years by a number of projects whose aims include providing online databases and syntheses of archaeological and bioarchaeological data (Corlett and Potterton 2010; Murphy et al. 2010; Cahill and Sikora 2011). The first two of these publications relate to Heritage Council funded projects that have specific bioarchaeological components: the Mapping Death Project and the People of Prehistoric Ireland Project, respectively.

The ending of decades of violent conflict in Northern Ireland has also had an impact on bioarchaeology. The Independent Commission for the Location of Victims' Remains (ICLVR) was established by the Irish and British governments in 1999 with the aim of recovering the remains of 16 victims who 'disappeared' during the conflict. The Commission has employed forensic archaeologists whose undergraduate training in bioarchaeology was obtained in Ireland. Bioarchaeological studies in Ireland have played an important role in the study of forensic taphonomy for the purposes of designing searches conducted by the ICLVR. In a related development, it is now more common practice for bioarchaeologists to work alongside the state pathologists and the two police forces in their respective jurisdictions in cases where human skeletal remains are discovered.

The last two decades have seen considerable achievements in bioarchaeology in Ireland. The profile of the discipline has been raised, and despite the impact of the recent economic downturn, the number of archaeologists gaining the necessary specialist skills has finally reached critical mass. The year 2001 was a milestone for the teaching of the discipline, with the establishment of two lectureships, one in human osteoarchaeology at Queen's University Belfast (EM) and one in bioarchaeology at University College Cork (BOD). This led to the first dedicated MA programme in bioarchaeology at UCC in 2004. The first PhD from the department in Belfast was conferred in 2010 (McKenzie 2010) while that from Cork was awarded the following year (Mullins 2011). Elements of bioarchaeology have more recently been added to the curricula at the Institute of Technology, Sligo and at University College Dublin with the latter supporting doctoral research projects and making its first permanent appointment in bioarchaeology in 2012. The focus in Irish bioarchaeology is now on synthetic and thematic projects and a number of initiatives are currently underway which will go some way towards furthering understanding of the past populations of Ireland.

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Chapter 12
Past, Present and Future Perspectives in Maya Bioarchaeology: A View from Yucatan, Mexico

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In this chapter, we wish to approach the core topic of this volume—i.e. global research perspectives in the study of archaeologically retrieved human remains—from the Peninsula of Yucatan. Being part of Mexico and at the same time a cultural component of the broader Maya area, which spreads over four other countries further south, Yucatan constitutes a unique academic setting, where Mayanist skeletal research shows distinctive (ethno) historical, cultural and political underpinnings. The following paragraphs explore each of these components, which have come to influence past and present research agendas. Drawing from the current status of studies of archaeological human remains, at the intersection of different academic traditions and political realities, we provide viable perspectives regarding future approaches that combine population and cultural data sets and propose guidelines that conform to socially sensitive, integrated, and theoretically informed scientific undertakings in archaeologically retrieved skeletal research.

Post-contact History

When the Spaniards set foot on the Yucatan Peninsula early in the sixteenth century, they encountered a complex native civilization that was the most sophisticated of those they had met in the New World until then. Here, ruling elites, who were knowledgeable in reading and writing, and performed complex astronomic and calendar counts, administered a densely settled cultural geography. European domination was not accomplished in Yucatan for decades after initial contact, partly due to the decentralized nature of native governments and the dense

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bushy forest, which effectively enabled the Maya population to sustain a guerrilla-like armed confrontation. Once installed, the new Spanish order doomed the natives to forced labour and cultural assimilation, along with which came disease and cultural breakdown. Native rebellions were on the order of the day, culminating three centuries later in the so-called Caste War (1847–1901). After the Mexican Revolution (1910–1920), native Yucatecans, although still poor and marginalized, have been gradually assimilated within the Mexican and peninsular geopolitical setting. Today, Yucatecan Mayan speakers constitute the largest of the more than 30 Maya modern language groups, a checkered amalgam of Maya cultural traditions and native-Hispanic identities. At the time as the living Maya Yucatecans have strongly drawn the attention of social anthropologists and linguists, their archaeological remains have evolved into one of the main focal points in global archaeology, to the extent that one of the Maya's best-known archaeological symbols in Mexico, the "Castillo" at Chichén Itzá, has been popularly voted as one of the new Seven Wonders of the World.

Archaeologically Retrieved Human Remains

While the cultural vestiges of ancient Maya society have proved a powerful attraction for both local and foreign scholars, one important source of information has been left relatively underutilized: the physical remains of the Yucatecan Mayas, those very people who contributed to build the society that is now much appreciated from the archaeological perspective. Today, studies of archaeological human remains still lag behind other approaches in the data-rich environment that characterizes Maya research (Cucina and Tiesler 2005: 30, Ortega and Tiesler 2011), namely epigraphy and archaeology. These disciplines have succeeded in reconstructing an ever more detailed and comprehensive picture of ancient sociocultural development and in further understanding many of the undercurrents of social change. Compared to our present state of knowledge on ancient Maya material product and written language, there is still no overall grasp of the biological composition of those who settled the cultural territory attributable to the Maya language family. While the maps of Maya geopolitics have been redrawn and the commercial distribution of goods are relatively well documented (Sharer and Traxler 2006), there is still no broader understanding on the population dynamics or their biocultural expressions.[1]

Several factors probably account for this shortcoming. Firstly, the ancient Maya used to bury their dead in close proximity to their living quarters rather than cemeteries. Only under specific circumstances did they employ central ceremonial buildings and civic spaces for mortuary purposes (Cobos 2003: 35; Tiesler 1996).

[1] The term "biocultural" refers to a large array of features in the human skeletal remains that are linked to cultural elements despite their biological substrate (Tiesler 1999).

The fact that most archaeological work still focuses on ceremonial centres and site cores has led in practice to a bias in the population profiles of human skeletal assemblages, which do not likely reflect the structure of the ancient living populations. The absence of true cemeteries also restricts the possibilities of prospective bioarchaeological research designs and the recovery of representative skeletal series. Furthermore, the aggressive tropical environment that characterizes most of the Maya world engenders the notoriously degraded state of the majority of archaeological human remains, translating into reduced sample sizes, lack of information and analytical possibilities. Modern looting, which specifically targets tombs, further aggravates this situation.

Academic reasons for the drawbacks in skeletal research can be found specifically within the geopolitical context of academic traditions and national cultural politics, which in the case of Mexico have been strongly centralized, concentrating the archaeological heritage around its capital Mexico City and the surrounding highlands (see Marquéz and González 2011).

Conventional archaeology in Mexico, on the other hand, has tended to treat human remains mostly as peripheral evidence. Consigned to the annexes of archaeological reports or extricated works on skeletal biology, skeletal studies typically still appear disengaged from the data sets considered essential for understanding the broader social networks of the past (Cucina and Tiesler 2008a: 65; Tiesler 2006). While this situation has started to change in recent years, many Mexican archaeologists still appear to be unaware of the great potential that skeletal data sets have in cultural reconstruction.

Academic Traditions

Skeletal studies on archaeologically retrieved remains from Yucatan have traditionally centred around topics set forth by either conventional Mexican physical anthropology (Márquez and González 2011) and, more recently, bioarchaeological frames of interpretation, promoted by peninsular and international scholarship (Buikstra 1997: 222; Cucina and Tiesler 2005).[2]

Firstly, Mexican physical anthropology has always been based in Mexico's capital, where it is taught in the classrooms of the governmental university, the *Escuela Nacional de Antropología e Historia* (*ENAH*), and studied in the laboratories of the Mexican *Instituto Nacional de Antropología e Historia* (*INAH*) and Mexico's National University (UNAM). Apart from Mexico City, governmental research on archaeologically retrieved remains is mainly carried out in the INAH's

[2] "Bioarchaeology" may be described broadly as a thematic specialization in archaeology or physical anthropology that studies human remains in their context and as part of the archaeological body of information employing explicit biocultural approximations (see Blakely 1977; Buikstra 1997; Powell et al. 1991).

state departments. Universities have started to incorporate increasingly physical anthropologists, trained at the ENAH.

Eurocentric research frames have always been prominent among Mexican physical anthropologists. This focus can be traced to the discipline's pivotal figure, Juan Comas, a Spaniard who found exile in Mexico during the Spanish Civil War (Faulhaber 1980). On a political scale, Mexican physical anthropology has been closely tied to the recovery of the nation's indigenous roots (*indigenismo*), considered not as "others" but uniquely "*lo nuestro*" ("our own"). Emphasis was and still is upon investigating the evidence from those populations that gave rise to Mexico's past splendour, along with the physical attributes of the native groups that now shared its territory (Serrano and Villanueva 1997). It must be stressed that the majority of human skeletal research in Mexico has been carried out on non-Maya populations, due to these patterns of centralization. In fact, until 1990, all Mexican researches on peninsular human remains from Yucatan have been carried out either by visiting scholars from Mexico City or directly in the capital, where collections like those from Jaina, Chichén Itzá or Cozumel have been shipped for study and curation.

Within the province of Yucatan, the University of Yucatan (UADY) in Mérida is the only academic institution to offer degrees that enable students to carry out active bioarchaeological research, aiming at promoting regionally based Maya studies and new frames for interdisciplinary research. For obvious reasons, the UADY's geographical location within the Maya region has allowed the development of a specific line of research oriented towards Maya skeletal remains. Here, and also in other parts of Mexico, explicitly bioarchaeologically oriented research has started to overlap in the last decade with more conventional research on ancient human remains.

There are differences in the manner in which Mexican-based research within local Maya scholarship has developed when compared to the bioarchaeological work conducted in the other countries sharing the Maya realm. Guatemala, Belize and Honduras, for example, do not offer training programmes in physical anthropology and therefore receive mostly foreign scholars to conduct research on human remains recovered from archaeological contexts. These come mainly from the North American continent, while having attracted fewer European or, in general, non-USA scholars. This trend relates in first instance to the geographical proximity between North America and Mesoamerica, which facilitates academic interaction.

The lack of integration of local scholarly efforts in Maya bioarchaeology is noteworthy. This dearth is underlined by the lists of contributors to two of the most cited American volumes on Maya bioarchaeology published in the 1990s (White 1999; Whittington and Reed 1997). These volumes include only two contributions by Mesoamerican-based scholars. Most of the USA-based scholars' attention has been directed to Belize, Honduras and Guatemala (as the two above cited volumes clearly indicate), where regulations for foreign archaeological undertakings are more lenient than in Mexico. This has led to a dominance of English-speaking

research and publications in non-Mexican Maya bioarchaeology, with a still reduced amount of comparable published data on the Mexican side of the Maya territory (Cucina and Tiesler 2005: 33).

Mexican Legislation, Human Remains and Yucatecan Maya Communities

Apart from the above circumstances, the way archaeologically retrieved human remains are studied is conditioned by the way archaeological research is being conducted and regulated. In Mexico, ancient physical remains are considered as archaeological material just like any other remains associated with pre-Hispanic and colonial human activity. As such, they fall under Federal Law that regulates the preservation, public management and investigation of the Mexican archaeological heritage, watched over by the Archaeological Council (*Consejo de Arqueología*) of the INAH (Anonymous 1990; see also Marquéz and González 2011). Since 1972, only professional archaeologists are permitted to preside over field projects that deal with archaeological material, including human remains. While this measure has benefited the professionalism of field research in general, in practice it has led to an unbalanced weighting of architecture and material culture in archaeological recording. At the same time, this situation has discouraged active field collaboration with non-archaeologists, such as many skeletal biologists, who have been relegated to merely assistant tasks during excavation (Buikstra 2007: 295; Cucina and Tiesler 2008a: 65).

It may come as a surprise, given the worldwide repatriation discussions (Buikstra 2006), that there are no vociferous native Yucatecan movements at present seeking the repatriation of ancestral human remains in Yucatan. This apparent lack of interest is echoed by native Guatemaltecan leadership and indigenous committees that claim different priorities in their social movements, although naturally perceptions do vary (Demarest 2007: 602–603).

We feel that the above situation is related to Mexico's history of colonization and native oppression, where the Spanish crown used forced assimilation of the Maya as a means to forge the new colonial society under European rule. For the Maya natives, this strategy involved forced Christianization, cultural repression and active destruction of native heritage (Mallafe 1973; Redondo 1995). Not only did the subsequent acculturation trigger a profound cultural repression, but also acted as forceful cultural scissors that separated pre- and post-contact Mayanhood identities (Tiesler and Zabala 2010). Naturally, this policy, which led to cultural amalgamation and biological admixture among the native and non-local populations, stands in sharp contrast to the colonization tactics of other imperial powers, namely the English crown, which clearly prioritized economic exploitation over social integration.

Today, Maya communities tend to trace and understand their ethnic identity through shared cultural elements and recent history that sometimes goes back to the colonial times. Their pre-Hispanic heritage tends to be regarded as remote and somewhat unrelated to the current ethnic setup.[3] Nowadays, although perception varies, indigenous Yucatecans generally do not see themselves as "Maya" but *mayeros* (Maya speakers).

Analytical Methods and New Socially Sensitive Approaches

While present research goals in Mayanist archaeology are not particularly different in from those pursued in the past decades, the paths to approach these goals have increased considerably in number in recent years, incorporating epigraphical research, statistics and an increasing amount of sophisticated special analyses. As noted above, the Mexican Maya territories have been the object of more recent explicitly "bioarchaeological" studies. Direct correlations between subsistence patterns, paleopathology and social status distinguish a number of recently published works (see Cucina and Tiesler 2003, 2007; Cucina et al. 2011a; Tiesler et al. 2010). Two long-standing Maya cultural traditions, that of head-shaping and dental decoration, have provided fertile research topics for contextualized biocultural research on a supra-local level (Tiesler 1998, 2000). Other works have scrutinized health and population structures and put these into context with single sites' ecology and economy, like for example the Classic period site of Xcambó in northern Yucatan (Cucina 2011; Cucina et al. 2003, 2011a; Méndez et al. 2009), the costal dwellers of Chac Mool (Marquéz et al. 2006) and El Meco (Ortega 2007), or the economic, social role and status of a colonial multiethnic society in Campeche (Tiesler et al. 2010).

Related to bioarchaeology is also the study of human remains from the taphonomic point of view, i.e. the study of *post-mortem* changes suffered by the body in order to reconstruct the varied and often complex posthumous body treatments that characterize ancient Maya traditions. Human taphonomic research, based on the concepts set forth by the French *anthropologie de terrain* (Duday 1997), has been applied to case studies (Pereira and Michelet 2004), and mortuary behaviour in general, either reverential or post-sacrificial (Tiesler 2004, 2007).

Together with a growing awareness and an effort to promote bioarchaeology, research has profited in the last few years from the proliferation of sophisticated analytical methods (see for example Cucina et al. 2011b; González-Oliver et al. 2001; Hodell et al. 2004; Price et al. 2006, 2008). The incorporation of these new tools as some sort of standard, default analyses that benefit from the combined

[3] Fortunately, it would be a mistake to think the modern Mayas are unaware of the origins and historical transcendence of their traditions and languages, a perception that has been fostered in recent decades by governmental programmes.

expertise of local and foreign scholars, coming from different fields such as physics or material engineering to name a few, has already provided valuable novel input on resolving old and new hypotheses on Maya migration, population history or diet.

Migration patterns through the detection of individual provenance is a fairly recent topic in Mexican Maya archaeology, which up to now has relied almost exclusively on the distribution of goods to infer population movement. While such analyses have already been performed in other parts of Mesoamerica (Price et al. 2000), their application is still in their infancy in Mexico's Maya area (Cucina et al. 2011b). The recent works on Calakmul, or the recognition of the earliest African immigrants unearthed in the early colonial cemetery of Campeche (Price et al. 2006, 2008), demonstrate the enormous potential of these methods for new generations of Maya bioarchaeologists and archaeologists alike.

Parallel to this, a series of dental studies, widely applied elsewhere in the Maya territory, are being adopted increasingly also in site collections on the Mexican side of the border (Cucina and Tiesler 2008b; Cucina et al. 2008). Although hampered by interobserver variations and limited sample sizes, the combined cross-regional results should soon offer a starting point for a new overall appraisal of Maya biological group affinities and macro-regional developments in an effort to foster a new biological grounded definition of what is Maya (Cucina 2013).

Apart from regulations, todaýs scholarly voices reiterate the need for accessing skeletal collections that are adequately preserved, documented and large in number, a fundamental problem in conducting Maya bioarchaeology. It is undeniable that without adequate samples, it is almost impossible to formulate inferences that go beyond assumptions and tendencies, and that modern techniques are of paramount importance to get out of the descriptive tunnel in order to learn more about the human facets of Maya society.

It must be underscored that most recent work in Maya bioarchaeology is at least theoretically informed; methodological and statistical approaches are more rigorously scientific as is data recording and elaboration. However, regardless of the methodological know-how and ability to use new techniques in a practical phase of the analysis, only an integrated knowledge of the ancient Maya will permit a shift from a methodological (though highly sophisticated) application of bioarchaeological approaches to truly interpretive academic outcomes. More and more Mexican undergraduate and graduate students have been focusing their interest in bioarchaeological approaches in the area. This is a very promising sign that indicates that bioarchaeology will grow and formalize. The challenge within this trend will be to channel efforts towards unified frames to reconstruct and interpret ancient Maya people and their life ways.

Besides research per se, a word about the suitability of osteological work as a venue for cultural reassertion of the modern Maya. The museum displays the recently opened Maya Museum in Mérida, which has been designed to reach out also to indigenous visitors, and includes 3D facial reconstructions of the skull of Bernadino Cen, a Maya Caste War hero, and of four more pre-Hispanic individuals, with the specific aim of making history come alive. These are accompanied

by a video module titled "the bones speak" ("*los huesos hablan*"). It recounts, in their own words, the hypothetical lives of a youngster from a coastal village, who lived during the first millennium AD, a boy who is about to be ritually immolated at Chichén Itzá. Also two females are given a voice: a young queen from Calakmul and a housewife from the Postclassic period town of Mayapán. Needless to say, all live narratives are grounded in archaeologically retrieved skeletal information.

One last issue concerns socially sensitive bioarchaeology in the Maya area, where natives still count among the marginalized and underprivileged, although efforts are made to raise the education and living standards of rural areas. We feel that, rather than in repatriation dialogues, the social impact of archaeologically retrieved human remains lies in their potential for comparing and teaching about past and present living conditions. Quite like other lines of archaeological research, the methodologies used in bioarchaeology have been derived from criteria developed from modern skeletal populations. Although the information extracted from human remains is admittedly restricted when compared to today's detailed medical histories and even full-body mummy examinations, it does provide unique glimpses of human diet, disease and overall living conditions of the remote past. Compared to subjective written sources, skeletal data sets, as material vestiges of the past, have the advantage of representing archaeological populations more objectively, including those members of past societies about whom history tends to remain silent: the underprivileged, women and children. Importantly, the techniques that are commonly applied to the investigation of past skeletal series may also be applied to modern populations.

The qualities, described above, make bioarchaeological approaches a powerful tool for objective, diachronic comparisons of aspects of present and past public health, and some of the locally based research efforts in bioarchaeology are currently going in this direction. A modern—and growing—skeletal reference sample of approximately one hundred individuals of Yucatecan origin and of known sex and age is being accrued from the municipal cemetery of Mérida. This series is curated and open for forensic and bioarchaeological research at the Universidad Autónoma de Yucatán (Chi Keb et al. 2013). Beyond its uses as a regional reference sample for the standardization of osteological techniques, it is also suitable for the examination, from an "ethno-bioarchaeological" perspective so to speak, of what is currently afflicting modern peninsular society in comparison with non-globalized ancient lifestyles. Contrarily to the standard approaches that use the present as proxy to reconstruct and interpret the past, the ethno-bioarchaeological approximation goes into two directions, which includes learning from the past to improve the present and the future.

The comparative potential of bioarchaeology gains importance specifically for the present rural Maya communities in the Yucatan Peninsula, which have paid the cost of progress and globalization in recent decades with important losses in long-standing eating habits, resulting in astounding rates of caries (Vega 2011), diabetes, obesity and malnutrition (Balam-Pereira et al. 2002). Here, well designed, targeted comparative studies of pre-Hispanic and colonial skeletal cohorts with modern cemetery series, or simply dental casts of selected rural populations, would

be a strong tool for measuring objectively the (mostly negative) impact of modern society in marginalized rural communities. They could provide new arguments and impetus for public education, in favour for readopting the balanced dietary habits of the past and to benefit public health in general.

One of the present endeavours for Mexican Universities is social transcendence. Agendas like that of the University of Yucatan (UADY) (2010) invite us to put our academic knowledge directly to the service of sectors of our society. We feel that this type of academic outreach has not been discussed enough to date for bioarchaeological endeavours in living Maya communities who still suffer marginalization in the face of rapid global change. What can bioarchaeology offer? What can be learned from the dead that can assist the living? There is still a long way to go; hopefully, we will see progress along this path in the years to come.

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Chapter 13
The Emergence of Bioarchaeology in Peru: Origins and Modern Approaches

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The Andean region, and Peru in particular, has many unique ecological and historical features that make it particularly well suited for the study of human remains from various archaeological contexts. Perhaps the most distinctive characteristic is the extremely arid climate in the coastal regions and highlands that preserves a wide range of organic materials, including human remains, textiles, faunal and floral materials. An analysis of human remains in Peru can, therefore, include not only standard osteological analyses, but also a variety of additional tests that increase our ability to interpret past human behaviour. Additionally, many Peruvian communities maintain some aspects of their cultural heritage that can be traced to the rich pre-Hispanic past. As such, there is a wealth of ethnographic and ethnohistorical data that can be used to develop contextual frameworks for the interpretation of archaeological data. These features make the Andes an extremely important area in which to evaluate past models of biological identity and mobility, patterns of health and trauma, and population dynamics. Yet in examining the emergence of bioarchaeology as a discipline in Peru, it is quite surprising to find that the study of skeletal collections from archaeological contexts is a relatively recent phenomenon, as it started at the end of the seventies. Nowadays, however, the incorporation of osteological data within a broader corpus of Andean anthropological discourse has become a common practice in the Andes (Blom et al. 2008; Guillén 2012; Shimada and Vega Centeno 2011; Verano and Lombardi 1999).

Excavations of human remains have occurred since the initial archaeological foreign expeditions were conducted in the Andes late in the nineteenth century. In fact, particular attention was given to the recovery of "ancient Peruvian skulls" by foreign scholars, such as Ales Hrdlicka, whose research included the history of migration in the American continent through the lens of morphological variability (Hrdlicka 1911). Field activities were carried out under the sponsorship of European and American institutions, and while the "skull" was the focus of such

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expeditions, virtually no attention was given to post-cranial remains or archaeological context.

Similarly, extensive mortuary excavations in Peru were conducted to collect ceramics and other grave goods. For example, Max Uhle's excavations at the turn of the century in Pachacamac provided this German scholar the basis for the development of cultural horizons based on stratigraphy and seriated pottery from funerary contexts still used today (Shimada and Vega Centeno 2011). While the excavations of cemeteries were instrumental to the emergence of Peruvian archaeology, the study of human remains followed a different path and was rarely integrated until fairly recently.

Echoing European and American academic traditions in Peru, archaeology was conceptually considered to be a sub-discipline of anthropology, whereas the analysis of human remains was inextricably linked to the physical anthropological and medical realm. Within this academic milieu, researchers were more concerned with the development of cranial typologies and the description of bone abnormalities, including practices of intentional cranial modification, than with archaeological models and/or anthropological questions.

Perhaps the earliest example of an interdisciplinary approach by a Peruvian can be traced to Dr. Julio C. Tello, a medical doctor who is today recognized as the "father of Peruvian archaeology". With his research beginning in the early 1900s, he was one of the first Peruvian scholars who studied human remains from archaeologically derived contexts and was sensitive to the cultural interpretation of his findings (Burger 2009; Daggett 2009; Guillén 2012; Lothrop 1948; Matos Mendieta 1986). More broadly, as a medical doctor by training, Tello was considered to be a leading intellectual in Peru, and reconstructing the Andean past was only one of his many interests (Burger 2009; Daggett 2009). His research in archaeology was strongly influenced by the work of Uhle, who hypothesized that Andean civilizations were the result of cultural diffusion, as these could not have emerged in the Andes (Lumbreras 2007; Shimada and Vega-Centeno 2011). Dr. Tello, who himself was of indigenous background, rejected this hypothesis and set out to disprove the theories of Uhle regarding the formation of complex societies in Peru. As such, Dr. Tello was more of a social theorist and historian who used archaeology in addition to a variety of other disciplines to explore theories of socio-cultural origins and change in the Andes, both in the past and present. Collectively, Dr. Tello's work, along with other social scientists, intellectuals and artists, led to the development of "*indigenismo*" a pro-indigenous movement in Peru during the first decades of the twentieth century (Burger 2009; Shimada and Vega-Centeno 2011).

Tello's career was publically acknowledged on 17 November 1908, when a brief article announcing the brilliant defence of his research paper entitled "*La antiguedad de la sífilis en el Perú*" was published in El Comercio, the most prominent newspaper in Peru at the time (Moreno 2007). This research was a requirement for his bachelor's degree in medicine from the Facultad de Ciencias of the Universidad Nacional de San Marcos in Lima. Due to his unique academic talents, he received an award from the Peruvian government to continue his studies

at Harvard in 1909, where he interacted with well-renowned American anthropologists. After receiving his MA degree in the United States, Tello continued his training in Paris, London and Berlin, returning to Peru in 1912 to join a number of academic institutions in a politically volatile climate over the control of the National Museum and resources used for archaeological research (Daggett 2009). In 1918, he received his doctorate from the Facultad de Ciencias, with his multidisciplinary research "*El uso de las cabezas humanas artificialmente momificadas y su representación en el antiguo arte peruano*" (Astuhuamán and Daggett 2004). Although both theses were based on ancient human remains from archaeological sites, they were accepted for his degrees in science and medicine, highlighting the long-lasting association between these fields (Guillén 2012).

Before he died in 1947, Tello wrote more than a hundred articles, and a substantial part of his research was published posthumously (Astuhuamán and Daggett 2004; Daggett 2009). Among his published manuscripts, at least ten were osteological studies in which he discussed themes such as syphilis, trepanation, palaeopathology, uta or leishmaniasis, health and disease (Dagget and Burger 2009). A detailed analysis of his pioneering syphilis BA thesis reflects a true multidisciplinary approach to diagnosis and interpretation of past diseases. Tello conducted a detailed and extensive ethnohistoric, linguistic and medical analysis of syphilis, as well as a comprehensive osteological examination of nine pre-Columbian crania. Although he was not trained as an osteologist, his observations of age, sex, as well as bone lesions were methodical and detailed, and remarkably similar to contemporary palaeopathological studies. After careful deliberation and a complete differential diagnosis, he concluded that syphilis was a pre-Columbian disease, an assertion that is still the subject of debate today.

With respect to his archaeological endeavours, Tello recovered a staggering number of burials from various sites in Peru, including Paracas, Pachacamac and Nazca; however, he did not oversee any comprehensive studies of these human remains. In this respect, Dr. Tello's career highlights the separation between archaeology on the one hand and the analysis of human remains on the other. He performed very sophisticated medical analyses of ancient human remains, but he did not conduct systematic studies with the vast number of burials that he himself had helped to excavate. Additionally, his palaeopathologic studies of pre-Columbian remains were exceptional though his research rarely answered archaeological questions, but focused instead on the history of diseases. After his death, he left a few students and collaborators in archaeology such as Toribio Mejia Xesspe and Rebeca Carrion Cachot. While not being a pupil per se, Tello influenced the work Dr. Pedro Weiss, who followed his interest in the study of human remains from archaeological contexts.

Within the intellectual and social climate that Dr. Tello helped to shape, Pedro Weiss became an active participant in the "*indigenismo*" movement. Weiss, known as the "Father of Pathology" in Peru, identified, described and characterized native diseases in living Andean communities, again attempting to demonstrate that certain diseases were native to the New World. Within this context, he studied osteological collections from archaeological sites in order to understand

the evolution of indigenous diseases in the Andes. For instance, he coined the term "Prehistoric Epidemiology" and suggested that Espongio hiperostosis or Hrlicka's Osteoporosis simetrica was related to malaria (1956). Two years later, he published "*Osteología cultural: prácticas cefálicas*" (1958), which was influenced by Tello's work. Departing from Tello's medical approach, Weiss explicitly wrote in this seminal work that the archaeological context from which skeletal remains are recovered offers a rich frame in which to interpret certain bone traits or features with past activity patterns, such as the presence of auditory exostosis in individuals that were exposed to marine activities. Furthermore, Weiss discussed topics such as trophy heads, trepanations, cranial modification styles and some pathological conditions. He framed his osteological studies within meaningful cultural patterns, through an analysis of the archaeological setting. This perspective paralleled the intense scrutiny of "the indigenous nature of Peru", and similar to Tello, Weiss was at the heart of this nationalistic intellectual and social movement in Peru. Tello and Weiss did not work in isolation in Peru, as they were familiar with research by foreign and leading physical anthropologists at the time such as Hrdlicka in the United States, the Spanish born physical anthropologist Juan Comas in Mexico, and the Italian born José Imbelloni in Argentina.

Still, palaeopathology and archaeology continued to evolve separately, and neither physical anthropology nor osteology was recognized as independent disciplines in Peruvian academic institutions (Burger 1989; Osterling and Martinez 1983; Oyuela-Caycedo et al. 1997; Shimada and Vega Centeno 2011). In fact, aside from the published work of Tello and Weiss, there are only a few isolated studies from Peruvian scholars or physicians that studied human remains from archaeological contexts. Tello initiated some osteological studies in the Andes; however, most of his legacy today is principally acknowledged as the creation and administration of museums. On the other hand, while Weiss's research of ancient human remains was more sensitive to the archaeological context, he worked within the medical sphere as a researcher and a professor in epidemiology. The lack of institutionalization of osteological analysis in Peruvian universities may be attributed to the fact that archaeology itself was not fully incorporated within the Peruvian academia until relatively late, that is, from 1930–1940, when compared to countries such as Argentina and Chile (Matos 1986). As stated earlier, Tello had a myriad of interests, and while he influenced others, teaching was not at the forefront of his career. Upon his death, the Instituto de Antropología, from which many renowned archaeologists started their prolific careers, was founded in 1946 (Matos 1986).

In the absence of a local development of research in the analysis of human remains, Peruvian archaeology was influenced by the North American tradition, which merged with those started by Tello, among others, in Peru (Burger 1989). Physical anthropology and osteological analysis, however, continued to be excluded from these interactions. Medical anthropology, on the other hand, seemed to have had a productive and lasting momentum during the first decades of the twentieth century. Juan B. Lastres, a physician mentored by Weiss, wrote extensively about the history of Peruvian medicine. As attested by his many

publications, including the detailed analysis of the colonial chronicler Guaman Poma de Ayala's images for the evidence of smallpox and tuberculosis in the pre-Columbian Andes (Lastres 1941), Lastres' goal was the careful documentation of disease and surgical intervention throughout the prehistory and history of Peru. His monumental work, summarized in three volumes, was published in 1955 to celebrate the fourth centennial of the Universidad de San Marcos in Lima (Guerra 1960; Lastres 1951). He died at a relatively young age, leaving behind not only solid medico-anthropological studies but also a strong academic legacy with his pupil and close friend Dr. Fernando Cabieses Molina, a Mexico-Peruvian neurosurgeon who would become instrumental to the future studies of human remains from archaeological contexts in the Andes.

Both physicians co-authored a book entitled "*La trepanación del cráneo en el antiguo Perú*" in 1960, but unfortunately, as acknowledged by Cabieses in the introduction of the book, Lastres died the year the book was published without seeing its final version (Lastres and Cabieses 1960). A close examination of this treatise reflects Weiss' strong influence, as well as a solid understanding of Andean perceptions of diseases through a careful analysis of colonial documents, ceramics, iconography and skeletal remains. This joint effort transformed Cabieses' professional career and marked the beginning of many of his studies associated with Andean health patterns and practices. Although this treaty is one of only a few studies conducted on skeletal remains by Cabieses, he published a plethora of manuscripts and books on ancient and contemporary health in the Andes, including his well-known book "*Dioses y enfermedades: la medicina en el antiguo Perú*" (1974). While Cabieses was neither an archaeologist nor a physical anthropologist, he recognized the importance of studies of human health and nutrition derived from living Andean communities (Guillén 2012). Considered a "Renaissance man" by many, he was also a member of the Consejo Nacional de Cultura, Insituto Nacional de Cultura, founder of the Museo Peruano de Ciencias de la Salud and the first director of the Museo de la Nación. Cabieses' prestige extended beyond Peru, and he was partly responsible for the creation of projects including Programa Contisuyo in 1982, a multidisciplinary Peruvian–American endeavour created for the study of Andean prehistory in southern Peru (Watanabe et al. 1990).

It was not until the mid-seventies, however, that data derived from the analysis of human remains were used in Peru to answer critical archaeological questions. Perhaps the best example of this combined approach comes from prominent American researcher Robert A. Benfer, a biological anthropologist who conducted extensive excavations at the Pre-ceramic cemetery of La Paloma in the Chilca valley. In fact, Benfer's 1976 project in La Paloma represents the first bioarchaeological project in Peru and involved the University of Missouri and the Peruvian Universidad Nacional Agraria, La Molina (Benfer 2012). Benfer's study provided osteological data regarding coastal adaptations and its effects on demography, health and nutrition at a time where the controversial "Maritime Foundation of Andean Civilization" hypothesis by Michael Moseley was being debated (Sandweiss 2008). Moseley's hypothesis proposed that agriculture was not

essential to the emergence of Andean complex societies and that the rich coastal environment provided enough resources to sustain stratified societies in the past (Moseley 1975).

The 1970s in Peru also witnessed a strong revival of the study of ancient diseases through the work of Dr. Marvin Allison. This American pathologist conducted systematic dissections of mummies, and among his many contributions to the study of past diseases worldwide was the first identification of tuberculosis by himself and his collaborators in a Nasca-affiliated mummified child of eight years, dated to 700 A.D. (Verano and Lombardi 1999; Guillén 2012). Allison's multidisciplinary, local team included Dr. David Mendoza, a physician, Mr. Alejandro Pezzia, an archaeologist, and the Argentinian pathologist Dr. Enrique Gertzen. While Dr. José Elías García Frías had already reported the presence of tuberculosis in a mummy in 1940 (Guillén 2012), with this team Allison incorporated the use of radiographs, tissue sampling, cultural context and radiocarbon dating (Allison et al. 1973).

Although Benfer and Allison represented two very different approaches to the study of the past through the analysis of human remains, their research was truly innovative at many levels (Allison 1984; Benfer 1984). The publication of their papers in "Paleopathology at the Origins of Agriculture" (1984) summarized some of the bioarchaeological approaches that both Allison and Benfer were conducting at the time in Peru. Rather than presenting isolated case studies, they stressed the importance of archaeological context and population-based approaches to examine the biological and health changes that coincided with the transition from pre-agricultural to agricultural societies in the Andes. These studies were hailed both inside and outside of Peru and attracted additional investigators who continued to shape the discipline of the study of human remains in Peru.

During the 1980s, osteological and mortuary studies along the north coast were started by John Verano, an American who was then a graduate student from University of California, Los Angeles. As part of the larger archaeological project directed by Christopher B. Donnan, Verano's doctoral research focused on patterns of biological relatedness between the Moche burials at Pacatnamu through a study of cranial metric data and multivariate statistical analysis. This study is yet another example of the new approach to the study of human remains, in which osteological data were used to test an archaeologically derived hypothesis (Verano 1986, 1997).

Slightly later to the osteological research in central and northern Peru started by Benfer and Verano, similar developments were occurring in southern Peru, largely through the initiatives of Programa Contisuyo. This multinational effort included leading institutions such as the Museo Peruano de Ciencias de la Salud directed by Dr. Fernando Cabieses and the Field Museum of Chicago with Dr. Michael E. Moseley (Watanabe et al. 1990). Archaeological research was partially supported by the large mining company, Southern Peru Copper Corporation, and other American funding agencies. Under the aegis of this project, with a grant from the National Science Foundation, in 1985 Drs. Don Rice, Geoffrey Conrad, and Jane E. Buikstra developed a multidisciplinary project to test the applicability of John Murra's hypothesis of Andean verticality (Stanish and Rice 1989). The study of

human remains, directed by Buikstra, was at the core of this project as the Andean verticality paradigm proposed the interaction and population movement between highland, mid-valley and coastal societies during the Late Intermediate Period, ca. 1000 AD. Similar to Benfer and Verano, Buikstra and her graduate student, Sloan Williams, developed protocols for excavating a representative number of tomb types at the pre-Inca Estuquiña site, participated in the mortuary excavations and conducted the systematic analysis of the recovered human remains (Williams et al. 1989).

It was during the late seventies and early eighties that Peru witnessed the introduction of the term "bioarchaeology" through leading American scholars. Buikstra redefined this term in 1977 as the study of human remains from archaeological contexts in order to address questions regarding population movement, nutrition and diet, health and trauma, status and identity (Buikstra 2006). In southern Peru, Buikstra herself directed the Chiribaya bioarchaeological project in 1989, which opened the door to many researchers and students from both Peruvian and foreign institutions (Blom et al. 2008; Guillén 2012; Lozada and O'Donnabhain 2013). In this context, Programa Contisuyo was particularly helpful in this endeavour, as it offered logistical support to many scholars of various institutional and national affiliations that continue to follow in Buikstra's footsteps.

Similarly, Dr. Verano who has remained mostly in northern Peru offered training and research opportunities to his students, among them Dr. Guido Lombardi, a Peruvian physician who specializes in the study of soft tissue from mummies. Both researchers have collaborated and co-authored relevant papers among them a pioneering article regarding the status of palaeopathology in the Andes (Verano and Lombardi 1999). In the same vein, Dr. Benfer, although now retired, has remained in Peru promoting institutional collaboration between the University of Minnesota and the Peruvian Universidad Agraria de la Molina.

Dr. Sonia Guillén, former collaborator of Dr. Cabieses, is a key figure in the history of bioarchaeology in Peru. Although trained at the University of Michigan under the tutelage of leading archaeologists, Sonia Guillén was also influenced by Buikstra when she attended her osteology course at Northwestern University in 1977. Furthermore, in 1983, she spent significant time at the Smithsonian Institution working with Lawrence Angel, Douglas Ubelaker, T. Dale Stewart and others. In the southern hemisphere, she continued her education with Dr. Marvin Allison, who after his stay in Peru in the 1970s became a palaeopathologist at the University of Tarapacá's archaeological museum in Arica, Chile (Guillén 1992). After obtaining her PhD from Michigan in 1992, Guillén founded two centres for bioarchaeoelogical research in Peru, one in Ilo, located on the south coast of Peru, and the other in the Amazonian region of Laymebamba. These centres represent the first and only training programmes in bioarchaeological methods in Peru, offering courses and research opportunities in skeletal biology and mummy studies to Peruvian students.

Yet another educational and research venue of the study of human remains, although one that is more aligned with the medical sphere, can be found at the medical Universidad Cayetano Heredia in Lima. As a posthumous recognition of

Pedro Weiss's contribution to medical anthropology, Dr. Uriel Garcia, former Peruvian Minister of Health, created the "*Cátedra de Patología Pedro Weiss*" in the 1990s. Dr. Lombardi, who also holds a Master's degree in physical anthropology from Tulane University, has been an associate professor in this well-renowned department and has published extensively on the health of ancient Peruvians.

Interest in the field of bioarchaeology also came from violent political events during the late 1980s and 1990s. Over the last 30 years, increasing evidence has come to light documenting violence, abuse and disappearance of many thousands of individuals throughout Peru during the political conflicts between 1980 and 2000. In 2007, la Pontificia Universidad Católica del Peru, under the guidance of Dr. Sonia Guillén, created a master's programme in forensic anthropology and bioarchaeology in part to satisfy recommendations from the Truth and Reconciliation Commission (TRC), a group of specialists dealing with the resolution of human right violations during the two decades of political violence. Among the many courses, this programme included human osteology, analysis of human remains and dental anthropology and was taught by leading international specialists. This master's programme was geared not necessarily towards researchers interested in the past, but to social activists, members of the Peruvian police division, and government officials. Along the same lines, José Pablo Baraybar, a Peruvian forensic anthropologist, founded the internationally renowned "*Equipo Peruano de Antropología Forense*" with the mission to systematically search for individuals that disappeared under political upheaval, to offer social and psychological healing and to empower those affected by such tragic circumstances. Under Baraybar's leadership, this forensic team has also worked in countries such as Venezuela, Chile, the Philippines, Nepal, Thailand and the Democratic Republic of Congo (EPAF 2014). Other important international events organized by Guillén, such as the "IV Congreso de Paleopatología en América" at the end of 2011, brought leading scholars to Lima, highlighting the rich and unique Andean past where the extraordinary preservation of human remains allows the diachronic and evolutionary examination of diseases such as tuberculosis, leishmaniasis, juvenile rheumatoid arthritis and many other health conditions worldwide.

The net effect of all of these cumulative national and international events and changes has been the recognition of bioarchaeology as a distinct and important discipline within contemporary Peruvian academic, social and political spheres. Unfortunately, while bioarchaeology has become firmly established in many universities throughout the world, there is no academic institution that offers a degree in bioarchaeology in Peru. In the early 80s, there were few bioarchaeologists, most of whom were trained outside the country by Jane E. Buikstra; however, today, there are more Peruvian researchers representing diverse schools of bioarchaeological investigation throughout Peru. In addition to Dr. Sonia Guillén, Dr. Guido Lombardi and José Pablo Baraybar, bioarchaeological research has also been conducted by Peruvians such as the author (Lozada and Buikstra 2002), Elsa Tomasto in Lima (Tomasto 2009), Elva Torres in Cuzco (Andrushko and Torres 2011) and Mirza del Castillo in Arequipa (Tung and del Castillo 2005). Judging from recent

trends, this number will likely increase, as Peru represents one of the few countries where mortuary excavations and the analysis of recovered human remains are possible.

I have argued previously that a certain degree of indifference to archaeological and bioarchaeological studies exists in Peru, as the past does not appear to be as important in the construction of a strong modern indigenous identity in contemporary society there (Lozada 2012). In this respect, Helaine Silverman states that modern Peruvians often have a contradictory relationship to the past, as their descendants were socially denigrated and politically disenfranchised during the last 470 years of colonial and postcolonial oppression (Silverman 2002).

Peru has offered bioarchaeologists unique tools to study ancient human behaviour, but it did not always have the institutional context and financial conditions to support this critical academic tradition. Although osteological analysis was rooted in Tello's work 70 years ago, the full potential of bioarchaeology as a discipline, as defined by Buikstra in the seventies, is evolving and growing in Peru. It is a privilege to be part of the transformation of an academic field that offers so many new and innovative ways to reconstruct both individual life histories as well as population events in the Andean past.

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Chapter 14
Controversies About the Study of Human Remains in Post-Apartheid South Africa

Alan G. Morris

South Africa is a place rich with the fossil evidence of the early ancestors of humanity. Sites with the skeletal remains from the Plio-Pleistocene to the Holocene have been discovered during the past century and as a result, South Africa has had, and continues to have, a very active archaeological and palaeontological programme of research (Morris 2009). Although there has been little controversy about the study of the ancient remains, the study of the Holocene and recent peoples has been more contentious because of issues about race and racial politics, and also, especially in the last decade, about claims of ancestry and demands for reburial of human skeletons in museum and medical school collections.

To understand these conflicts, it is important to understand South Africa both as a colony and as an independent country struggling for an identity complicated by racial politics. Although eighteenth and nineteenth century science did touch the shores of South Africa, it was very much in the form of European scientists visiting the colony and either making records of their observations or gathering specimens to take back to their respective fatherlands. Human skeletal remains in particular were considered to be part of the native fauna of distant lands, and no European natural history collection could be considered complete unless it contained a representative quantity of human skulls (Morris 1987). What this meant was that by 1850, African skeletons and especially the skeletons of Khoesan people could be found in nearly all of the major European museums. Most of these skulls or skeletons were donated by or purchased from travellers who had acquired them as curiosities during their visits to southern Africa. The active collection and curation of skeletons in South Africa did not begin until late in the nineteenth century, but by 1910, large series were present in a number of South African museums and several could boast an appreciable sample of Khoesan and a smaller set of black African crania. The South African collections differed from their European counterparts in the large number of individuals represented and in their

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regional specificity, but it must be emphasised that the majority of these specimens collected during the twentieth century were drawn from archaeological contexts rather than as specimens of racial types (Morris 1992).

Biological Anthropology and the Study of Human Skeletons in South Africa

South African anthropological research began first in the museums, but later manifested itself in the new universities and in the medical facilities attached to the Native Labour Associations of mining companies (Morris 2005). By 1918, natural history museums containing human skeletal remains were present in Bloemfontein, Kimberley, Pretoria, Grahamstown, Port Elizabeth and Cape Town. Each of these museums had research posts linked either to anthropology in general or to archaeology, and Cape Town in particular had a special interest in physical anthropology under the direction of Louis Péringuey (Summers 1975). By the same year, South Africa had its first two universities (Cape Town and Stellenbosch) and the proclamation of a third university in Johannesburg was well under discussion. Cape Town's medical school had begun research into the anatomy of the 'native races' with the appointment of its first anatomist in 1911, and this focus on biological anthropology was followed by the new University of the Witwatersrand when it hired its first anatomist in 1919 (Tobias 1990).

The programmes of anthropological research in both the South African museums and universities followed the European pattern of separating physical anthropology and archaeology from social and linguistic studies. Physical anthropology in particular was lodged in the domain of the anatomists in the medical schools. Research in the museums focused heavily on the nature of racial types of native populations and then concentrated on palaeoanthropology after the discoveries of early human fossils especially in the 1930s. This separation of social and physical anthropology was not seen as an issue at the time, but in hindsight, it was a major factor in preventing physical anthropology from engaging in the sociopolitical development of the country during the years of apartheid. By the 1940s, social anthropology had divided into two distinct camps. The Afrikaans-speaking universities (and the Departments of Anthropology in the State Museums) taught anthropology as 'volkekunde' in the form of descriptive anthropology based on the German 'ethnos' theory—the cultural analogue of biological typology. Each 'volk' (people) was said to have its own culture linked to inherited physical and mental characteristics, and students of volkekunde concentrated on culture traits that differentiated between groups (Sharp 1981). Their interpretations were strongly Social Darwinist because of this historical and evolutionary approach. Social anthropology in the English-medium institutions was distinctly British in its comparative examination of social phenomena, and its focus was on the commonality of human behaviour and how all humans have the ability to adapt to local conditions (Kuper 1983). These social anthropological debates had particular importance as the idea of apartheid arose in

broader South African society. Although the development of apartheid was strongly influenced by theologians and politicians (Dubow 1995), its intellectual heart was provided by the volkekundists as the apartheid policy of the separation of races was rolled out in the 1950s (Sharp 1981; Gordon 1988).

Separate from both of these philosophical groupings were the physical anthropologists. Although they had an express interest in racial variation and racial origin, these scientists chose to avoid the political debate about apartheid and were not involved in the development and administration of the apartheid policies (Tobias 1985). There were absolutely no editorial or other published comments about the new policy on race in the pages of the *South African Journal of Science* between the years 1948 and 1955. Despite this apolitical approach, their writings effectively supported the underlying logic of apartheid by providing fixed typological models of race that fit comfortably in with the rigid cultural models being propounded by the volkekundists. The marginalization of physical anthropology from the debate continued even when alternative views were expressed in the 1960s and 1970s by the newer generation of physical anthropologists represented by Ronald Singer and Philip Tobias (Morris 2012).

The implications of this academic debate for the study of human skeletal remains from archaeological contexts were profound. Morris (2005, 2012) has labelled the era between the 1920s and the 1950s as the 'Age of Typology'. The description of cranial types that could be used to identify past populations from South Africa was a characteristic of the work of Raymond Dart, Robert Broom, Thomas Dreyer and Matthew Drennan. Racial origins were a central focus, especially with the addition of archaeologically derived types such as Boskop and Kakamas, both of which became planks in the discussion of the origin of the living Khoesan peoples of the region. Sites such as Mapungubwe and Bambanyanalo which are today understood as complex African states developing out of the Bantu diaspora a thousand years ago (Steyn 1997, 2007) were presented in the 1930s and 1940s as mysterious remnants of ancient Khoesan peoples based on the analysis of cranial features said to be typical of the 'Boskop type' (Galloway 1959). The typology of the period also presented native peoples in general as primitives who were left in a kind of cultural and biological backwater (Morris 2012). The breaking of the typological trap in the 1970s and 1980s came too late to influence the development and application of the racial policy by the apartheid government, but it did have influence on the development of archaeology and attitudes towards research on human skeletal remains that we have today.

Politics, Archaeology and Human Skeletons in the 'New' South Africa

The 1983 South African Association of Archaeologists meeting in Gaborone heard a motion from its members in support of an explicit statement on the condemnation of apartheid along with other proposals to control the direction of research,

but the resolution was not carried. It is unlikely that the overwhelmingly white membership was overtly racist, but the archaeologists were displaying the same occluded vision as the physical anthropologists in the belief that science and politics should not be mixed. The result of the failure of the motion to pass resulted in some members withdrawing from the Association, and it set the stage for the larger conflict that played itself out 2 years later in England as part of the anti-apartheid academic boycott of the country. In 1985, 19 South African and Namibian archaeologists were refused permission to join the meeting of the International Union of Prehistoric and Protohistoric Sciences (IUPPS) to be held in Southampton. There was acrimonious debate in the journals and in the newspapers in which arguments were aired both for and against the academic boycott and in the end the issue caused the IUPPS itself to split and the World Archaeological Congress (WAC) was launched in September 1986 without the South Africans. The academic boycott had relatively little effect on physical anthropology during these years. It remained very much a field of study limited to the medical schools and was therefore isolated from the debates about racial identity which polarized the Afrikaans and English social anthropologists. Contact with foreign academics was frequent for both archaeologists and physical anthropologists, but research foci remained local.

The situation changed significantly after the end of apartheid in the early 1990s and the first non-racial democratic election in 1994. The greatest impact of the end of apartheid was not so much academic as it was political, manifesting itself as a debate about ethnicity amongst previously disadvantaged communities. Under apartheid, ethnicity was determined by government dictate with four large 'racial' categories and a myriad of smaller 'ethnic' groupings based on language and tribal or historical association. The 'racial' category determined an individual's access to housing, schools, employment and political expression, but although the 'ethnic' category could complicate life (for example, by dictating which 'homeland' an individual was linked to), it was the 'racial' categories that had carried the larger impact. The national election of 1994 was a political transformation in which it was assumed that ethnicity and race would be of little importance compared to their role under apartheid. Despite that, the new government immediately began to apply racial quotas for access to government contracts and jobs. The stated objective was redress and equity, and preference was given to those who were drawn from 'previously disadvantaged groups'. Quotas for employment in government departments were calculated on the basis of national racial statistics using the four broad apartheid categories of 'white', 'coloured', 'indian' and 'black'. The new government faced a conundrum in trying to correct the inequalities of the past by using historic apartheid racial categories, yet avoiding giving these same groups race-based political rights.

Even more important was the fact that the government had initiated a process of land claims to redress the injustices of the past, but they had made a specific decision to limit their considerations only to those who claimed land taken from them after 1913. That was the year that the Union of South Africa promulgated the Land Act which segregated land ownership into 'black' and 'white'. For the

Khoesan people of South Africa, their dispossession happened long before 1913 and because of this, the only legitimate claim that anyone could make for restitution of land taken from them before 1913 was if they could demonstrate a link to traditional tribal leaders of groups whose names appeared in the old historical records. This was paired with the rise in claims for ethnic rather than racial identities. Under apartheid, people of mixed genetic ancestry had been lumped into a racial category called 'coloured', but in the new South Africa many wanted to claim an ethnic link to the Khoesan in order to claim heritage legitimacy. In the same way, many black communities were focusing on their ethnic/tribal identity for specific land claims. Ethnic identities were resurfacing as communities contested access to a 'fair share' of the economic and land redistribution pie.

Critical to the ethnic resurgence of the mid-1990s was the ancestral claim to archaeological and historic skeletons. Two events during this period provided an opportunity for descendant communities to identify themselves ethnically and to claim their archaeological ancestry. In 1997, the University of the Western Cape along with the University of Cape Town and the National Monuments Council organised a conference at the South African Museum entitled 'Khoisan Identities and Cultural Heritage'. Nearly half of the invited delegates came from the various Khoesan communities around southern Africa. Only a few presented papers in the scientific part of the programme, but all were involved in discussions afterwards. One group in particular, the Griqua National Conference (GNC) of the Griqua people, chose the gathering to begin its claim to represent all Khoesan people and to demand the return of the remains of Sara Baartman to South Africa. Baartman had been taken to London in 1810 and exhibited as 'the Hottentot Venus'. She died in France in 1815, and her skeleton, brain and sexual organs were accessioned to the Musée de l'Homme where they still resided. The GNC was also prominent in January 1999 when the University of Cape Town hosted the fourth World Archaeological Congress. The conference was very much a welcoming of South Africa back into the international fold of archaeologists after the long dark period of apartheid. The fact that the exclusion of South Africans in 1986, as the cause of the formation of WAC, made the 1999 Cape Town conference an especially important symbol of a new era in archaeology. The presence of Khoesan and other descendant communities from all over southern Africa as delegates gave them a voice in a venue that could be heard by the professional body of scholars. The GNC's call to reclaim the remains of Sara Baartman started a process that unfolded over the next few years in the form of a national debate that only ended in 2002 when Baartman's remains were returned and given a state funeral near Hankey in the Eastern Cape (Tobias 2002; Crais and Scully 2009).

The 1999 WAC conference sensitised archaeologists to the place of indigenous peoples in the discovery of their own history through archaeology at exactly the time when South African legislators were considering new legislation that would transform the face of heritage management. Although the context was local, WAC delegates from overseas provided information about their own experience in dealing with human remains in museum repositories, including the important guidelines provided by the Vermillion Accord as part of the WAC Inter-Congress of 1989.

Heritage Legislation, Science and Descendant Communities

Nearly all South African legislation was re-examined in the years after the first democratic election in 1994, and heritage was not excluded. The new National Heritage Resources Act (NHRA) of 1999 changed the professional structure of archaeology to a significant degree and has had a major impact on excavation and study of human skeletal remains. Chief amongst these changes has been the shift from the emphasis on the regulation of scientific investigation (and storage of excavated material) to a broader focus on community participation and heritage stewardship (Nienaber and Steyn 2011). The legislation has firmed the role of the South African Heritage Resources Agency (SAHRA) and has set the framework for provincial heritage resources authorities to administer archaeological work at the provincial level. Under the Act, all archaeological and palaeontological material continue, as in earlier legislation, to be the property of the state and all excavations require a permit, but new rules have been legislated to deal with the sensitive issue of human burials.

The NHRA defines all graves older than 60 years to be heritage assets and requires that no excavation of such sites can be carried out until every effort has been made to trace relatives or descendant communities. There must be a documented process of public participation and social consultation, and descendant communities must be consulted about the ultimate deposition of the skeletons in terms of the study of the remains and re-interment (Nienaber and Steyn 2011).

Where human remains are discovered accidentally or in the course of development, the age of the grave must be established in consultation with the police, and if it is older than 60 years and is outside a formal cemetery managed by a local authority, then a similar process to the formal archaeological excavation noted above must be facilitated.

The new 1999 legislation focused only on the excavation of human remains, and it did not consider skeletons already excavated and currently stored in museum or medical school collections. The decisions about access to study and reburial have been left to the repository institutions themselves although national legislation is currently under discussion. The McGregor Museum in Kimberley sponsored a workshop in September 2001 to discuss what to do about skeletons in museums that had been collected specifically as specimens from race science in the early twentieth century. The curators of the major skeleton collections were invited along with a wide range of Khoesan representatives from the Northern Cape. One of the outcomes of the workshop was the decision to identify such specimens in all of the museum collections and to ensure that such individuals are reburied. In the following years, similar discussions and policy decisions were also made at the University of the Witwatersrand in Johannesburg and at Iziko Museums in Cape Town. Wits drafted a policy in 2003 that recognised the right of descendant communities to claim ancestral remains to which they are culturally affiliated, and under this policy returned a series of Griqua skeletons excavated in the 1960s for formal reburial at Campbell in the Northern Cape Province. The Iziko Museum in

Cape Town developed a formal policy between 2003 and 2005 to allow study of its collection of human skeletons. This included the creation of an advisory committee made up of scientists, theologians and members of descendant communities who would consider each independent request. Permission would only be granted for study of the bones if it was felt that such investigations would add further knowledge about the people in a manner that gave due respect to the remains themselves.

The issue of the disturbance of graves and the reburial of previously excavated human skeletons has been at the forefront of discussions of both professionals and the lay public, but not all issues have been resolved satisfactorily (Sealy 2003). There is a strong movement for the reburial of all archaeological human skeletons whether or not such studies would add knowledge or not. Several skeletons which had been previously studied including the slave grave from Vergelegen (Sealy et al. 1993), the Gold Burials from Thulamela (Steyn et al. 1998), and the Griqua graves mentioned above have been reburied with the local community's knowledge and co-operation, but not all such attempts have gone smoothly. The discovery of a large eighteenth century cemetery in Prestwich Street during commercial redevelopment in Cape Town in 2003 was particularly unpleasant. Opposition to the excavation was voiced from a group based at the District Six Museum. The debates took on a distinctly racial overtone by implying that it was white colonialists who had oppressed these people in the past and now white developers were going to make money out of the land in which they were buried. Eventually, the acrimony resulted in the Minister of Arts and Culture having to make a final decision. The excavation was allowed to proceed, but the developer had to fund the construction of a mausoleum for the storage of the human remains that would also act as a memorial museum to the people of old District One in Cape Town. The one area excluded from this agreement was the study of the skeletal remains (Morris 2011). The exclusion of further study of the human remains from Mapungubwe was also a factor in the discussion about the reburial of these remains. The site and its human burials are of World Heritage importance, and it was argued that future research on the skeletons would lead to a better understanding of the rise of African civilisations. Although a request was made to provide access to the skeletons in the form of a vault, the final decision was to permanently bury the remains without future access (Nienaber et al. 2008).

Despite the problems at Prestwich Street and Mapungbwe, bioarchaeological research continues in South Africa. The Lotto-funded Green Point Burial Ground Project under the direction of Antonia Malan is collating and digitising the available archaeological and skeletal biology information from the historic burial grounds of Cape Town including Prestwich Street. Stable isotopes and past human diets have been the focus of research projects covering human remains from deep evolutionary antiquity right up to historic times (Cox et al. 2001; van der Merwe et al. 2003; Mosothwane 2010). Both the University of Pretoria and the University of Cape Town have developed forensically oriented programmes that include aspects of human variation (past and present) and osteological pathology (Morris and Steyn 2012), but interests in archaeological specimens continues at both

schools. Over 500 archaeological skeletons in the museum collections have now been dated, and this has dramatically increased the value of these specimens because research can focus on progressive temporal changes in different regions of the country. The remains of Later Stone Age peoples have become a particular interest of a combined South African–Canadian research group under Susan Pfeiffer of the University of Toronto. Morris and Pfeiffer are currently working on a new edition of Morris's (1992) Catalogue of Holocene Human Skeletons which will include all the new radiocarbon dates and reference to over 100 papers that have been published on southern African skeletons since 1992. A series of papers on African skeletons in regional and overseas institutions has recently been the focus of a project by Steyn and Mosothwane at the University of Pretoria supported by the *South Africa Netherlands Research Programme on Alternatives in Development* (Steyn et al 2013). The most recent development in this debate has been the call for a national register of human skeletal remains in museum collections and a more formal national regulation of future research on them. The National Heritage Council of South Africa (2011) published a position paper on a policy framework for repatriation in which the need to accommodate the views of both scientists and other interested parties was a central issue. This is consistent with the ethos of the NHRA of 1999 in which heritage needs to be developed as a resource for rectifying the past and to deepen the understanding of cultural diversity through research (Nienaber and Steyn 2011). This is not solely a function of science but requires empowered communities who share in the custodianship of the remains. With this in mind, the Association of South African Professional Archaeologists (ASAPA) has also taken a role in this by developing a mentoring programme to draw students of 'indigenous' origin into the field.

Although the question of the study of human skeletal remains in South Africa remains a contested issue, the importance of archaeology and physical anthropology to the nation as a whole must not be understated. The combination of the long archaeological record with its complexities of foragers, pastoralists and agriculturalists sharing the landscape with the evidence of our ancient human roots in the form of the early Hominin sites gives South Africa an ancient heritage that few places on earth share.

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Chapter 15
The History of Physical Anthropology in Turkey

Handan Üstündağ and Gökçe Bike Yazıcıoğlu

The establishment of physical anthropology in the Republic of Turkey is intricately tied with the political history of the country. After the collapse of the Ottoman Empire following World War I (1914–1918), the Turkish War of Independence (1919–1922) was fought in Anatolia[1] against the occupying forces of the European nations and the Republic of Turkey was founded in 1923 as a modern and secular nation-state. As such, the founding father of the nascent Republic, Mustafa Kemal Atatürk, and his inner circle of advisors were faced with three major challenges. The first was to establish the founding principles of the "nation" in order to formulate a new sense of identity, homogeneity, and unity among the multi-ethnic, multilingual and multi-religious populations of the fallen Ottoman Empire, who had now all become Turkish citizens (Tanyeri-Erdemir 2006). The second challenge was the radical shift from the Islamic rule of the Empire to the secular democratic rule of the Republic, which necessitated not only modernizing reforms in all areas of social life, but also a new rhetoric and a redefinition of "civilization". The intellectual elite dissociated themselves from the Ottoman past and began to seek alternative sources in the deeper past, such as the Central Asian Turkic ancestors and the ancient Hittite Empire of Anatolia, to redefine "Turkish civilization" (Aydın 1996; Yazıcıoğlu 2007). The third challenge was to define the place of the new nation-state on the international scene. In this period, "to reach

[1] Anatolia is the peninsular land mass surrounded by the Mediterranean, the Aegean, and Black Sea and comprises the bulk of the national territory of the Republic of Turkey, besides eastern Thrace. In archaeological literature, Anatolia and Turkey are used interchangeably to refer to the same geographical area.

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the level of modern civilizations" became the motto of the new Republic and a rapid westernization process began as positivism replaced religious faith. The Turkish State embarked upon a mission to reinvestigate and rewrite the history of the Turkish nation by way of exploring the historical, linguistic, cultural, and racial characteristics of Turks with scientific methods (Tanyeri-Erdemir 2006).

In the following pages, we will first discuss the early assessments of Anatolian "races" by foreign scholars before the foundation of the Republic of Turkey. Secondly, we will review the institutional history of Turkish anthropology in its formative period (1923–1940s) and outline the nationalist rhetoric of the state, which shaped the research agendas of physical anthropology in Turkey. Then, we will briefly discuss the impact of World War II (1939–1944) on the regression of physical anthropology and the impact of the founding of new universities on the revival of the discipline during the late 1990s. Finally, we will comment on the promising directions for future research in physical anthropology in Turkey.[2]

Assessments of Anatolian Races Before the Republic of Turkey

The earliest physical anthropological studies on archaeologically retrieved human remains in Turkey were conducted by German and Austrian researchers at the end of the nineteenth century, when the country was still ruled by the Ottoman Empire. This initial stage of research consisted of craniometric studies, which reflect the predominant notions of race at the turn of the century in Europe and around the world. Within this paradigm, scholars categorized modern human populations into races according to skull forms and sought to trace direct ancestry from ancient inhabitants. As such, we often see the category "Turkish" as a misnomer used for ancient populations of Anatolia, although the earliest Turkic tribes are known to have immigrated to Anatolia in the eleventh century AD.

Among notable studies of this period, we should first mention Augustin Weisbach's "Die Schädelform der Türken" published in *Mitteilungsblatt der Anthropologischen Gesellschaft* in 1873. Weisbach was an Austrian medical doctor with a personal interest in anthropology and craniometrics, who worked in Istanbul (the capital city of the Ottoman Empire) for 18 years. Weisbach's study was based on the measurements of 78 skulls and concluded that the characteristic skull type for the "Turkish race" was brachycephalic .[3]This study was followed by Rudolf Virchow's (1882, 1884, 1896) craniometric studies on excavated human remains from

[2] This chapter mainly focuses on the ideological background of physical anthropology in Turkish academia and only briefly mentions the research of foreign scholars. Further details on current research in Turkey can be seen in Üstündağ (2011).

[3] Vyslozil et al. (1996) also mention limited studies on Turkish skull types by Blumenbach, Carus, and Retzius predating Weisbach's work.

archaeological sites dating to various periods in western Anatolia and Cyprus. A few years later, Houzé's (1903) study on skeletons excavated in prehistoric cemeteries concluded that the ancient inhabitants of Anatolia were mainly of dolicocephalic type. Von Luschan (1911), on the other hand, characterized the modern population of Turkey as a synthesis of "Hittite, Semitic and xanthochrous Nordic" elements, in his manuscript titled "The Early Inhabitants of Western Asia".

Institutional History of Turkish Physical Anthropology in the Formative Period (1923–1940s)

At the end of the nineteenth century, a modernization project had started in the Ottoman Empire, and an Academy of Sciences (*Darülfünun*) was established in Istanbul in 1900. After the foundation of the Republic in 1923, this modernization project was transformed into a westernization process, and "positivism" became its most prominent component in tandem with the secularist regime that replaced the Islamic rule of the Empire. The first decades of the Turkish Republic (1920s–1940s) were critical in the establishment of physical anthropology and archaeology as academic disciplines. Institutes and university departments were founded by the state, and research was directly funded by the government in order to propagate a new national identity. Physical anthropology gained particular significance in Turkish academia not only because it was a pure positivist science, but it could be conveniently appropriated as an ideological tool, as well. The state sought to provide scientific evidence for the racial homogeneity of ancient and modern inhabitants of Turkey, and their racial equality to Europeans through physical anthropology.[4]

The Turkish Anthropological Research Center (*Centre des Recherches Anthropologiques de la Turquie*) was first established in 1925 as a subdivision within the Medical School of the Istanbul Academy of Sciences (*Istanbul Darülfünunu Tıp Fakültesi*) with the initiative of an anatomist, Dr. Nureddin Ali Berkol. In the same year, the first issue of the Turkish Anthropological Journal (*Revue Turque d'Anthropologie*) was published, bilingually in Turkish and French.[5] This Research Center aimed at training young scholars, who would establish the place of Turks among all the racial groups of the world through scientific research

[4] For other critical overviews of the development of anthropology, physical anthropology, and archaeology in Turkey and their use in the formation of national identity see Atakuman (2008), Aydın (1996, 2000, 2005), Özbudun Demirer (2010), Özdemir (2003), Pulhan (2003), Tanyeri-Erdemir (2006), and Yazıcıoğlu (2007).

[5] This journal continued to be published until 1939. After a long break, in 1964, the Anthropology Department of the Ankara University began to publish the journal again with its new format and new name, *Antropoloji Dergisi*. Except for a four-year break (1998–2001), the journal has continued uninterruptedly until present day. The journal includes physical anthropology, palaeoanthropology, bioarchaeology, and social anthropology articles, which are mainly in Turkish.

(Kansu 1940). Between 1925 and 1929, skulls were collected from Turkish-Islamic cemeteries in Istanbul to be measured at the Research Center and the studies published in the early issues of the Turkish Anthropology Journal mainly contained comparative anthropomorphic studies of various ethnic groups in Istanbul. In 1929, the Center became an institute and its faculty (Dr. Mouchet, Dr. Süreyya Ali, Dr. İsmail Hakkı, and Dr. Neşet Ömer İrdelp), who were all anatomists by training, formed the editorial board of the journal (Uluçam et al. 2002). Famous individuals from the elite circles of the early Republic, as well as statesmen, had taken active part in the foundation of the Center, which demonstrates how important the research agenda of this institution was for the nascent Turkish State (Aydın 2000, 2001). The Minister of Education, Hamdullah Suphi Tanrıöver, was the honorary director of the editorial board, and French anthropologists like Prof. Papillault of *Ecole d'Antropologie de Paris* and Prof. Mac-Auliffe of *Ecole des Hautes Etudes de Paris* were among its honorary members (Uluçam et al. 2002).

Meanwhile, the government launched an initiative to foster the education of Turkish anthropologists in Europe and in the USA. Between 1927 and 1934, state funds were used to send Turkish students for higher education at the anthropology departments of *École des Hautes Études de Paris*, Harvard University, University of Berlin, and University of Geneva (Kansu 1940). It can be said of this early period that the racial paradigm of the German school of physical anthropology and the social paradigms of French idealists laid the methodological and theoretical foundations of physical anthropology in Turkey. However, the agendas for which Turkish scholars employed the empirical study of human remains were particular to the ideological milieu of the nascent republic.

The Impact of Nationalism on Anthropological Research

To understand the political environment in which physical anthropology was born in the Republic of Turkey, we need to discuss the role of the Turkish History Thesis (*Türk Tarih Tezi*). This Thesis was written by influential scientists, historians, and ideologues of the time and was propagated by the Turkish Historical Society (*Türk Tarih Kurumu*), which was founded in 1930. The Thesis was based on the idea that Turks had a common origin in prehistoric times and preserved their language, culture, and racial characteristics since then. Accordingly, the Turks were a group of people, whose homeland was Central Asia, where they created a great civilization in prehistoric times. These people moved out of Central Asia through episodes of migration and spread civilization to different parts of the world such as China, India, Egypt, Mesopotamia, Iran, Anatolia, Greece, and Italy (İnan et al. 1930). As such, the Turkish History Thesis problematically accepted the indigenous prehistoric populations of Central Asia as Turkic, despite the lack of any evidence for genealogical connections between archaeological and living populations (Atakuman 2008). At that time, it was also argued by some European researchers

that Central Asia was the origin of Aryans or Indo-Europeans (e.g. Berthelot 1930). İnan (1932) argued that since Turks were the earliest peoples of Central Asia, what modern European researchers called "Aryan" or "Indo-European" were actually prehistoric "Turks", which also meant that Turks were the ancestors of Indo-Europeans. Furthermore, the Hittites, who had built an ancient empire in Anatolia, were also regarded as the direct ancestors of Anatolian Turks (İnan 1932). Since the Hittite language is the oldest written Indo-European language, the Hittite presence in Anatolia was seen as supportive evidence for this ancestral association between the Indo-Europeans and Turks. By claiming Anatolia to be the cradle of civilization, the supporters of the Turkish History Thesis created an alternative narrative to the birth of Western civilization in Mesopotamia and/or Greece.

In the formative period of the Republic, the main theme that occupied the intellectuals' agenda was to prove to the world (especially the Western world) that the Turks were not barbarians, but a proud nation who created an influential civilization. The suggestion that Turks had lived in Anatolia since the beginning of history was also important for the legitimization of the presence of the new Turkish Republic in this territory (Tanyeri-Erdemir 2006). One of the most important goals of this Thesis was to show that Turks were equal to Europeans, not only in terms of their achievements in history, but also in terms of their racial characteristics. According to the Turkish History Thesis, the ancient as well as the modern Turks were brachycephalic, similar to central Europeans. The defenders of the Thesis decided to fight against a Western prejudice at that time, which considered Turks as "barbarians of Mongolian race". The racial agenda of the Turkish History Thesis was to disprove the statement that Turks belonged to the Mongoloid race or to the Near Eastern races (Aydın 2000, 2001; Atakuman 2008).

The first and second meetings of the Turkish Historical Society in 1932 and 1937 are critical for understanding the key role of physical anthropology, as well as archaeology, in the intellectual atmosphere of the early Republican period in Turkey. The Turkish History Thesis was openly announced at the First Turkish Congress of History, organized by the Turkish Historical Society, which took place in 1932 in Ankara. The participants of the meeting were Turkish scholars, intellectuals, and history teachers. Mustafa Kemal Atatürk, the founding president of the Republic of Turkey, attended every session, which shows the political significance of this meeting. The participation of school teachers, on the other hand, shows the intention to disseminate the Thesis through public education (Tanyeri-Erdemir 2006). The objective of this meeting was to formulate the hypothetical basis of the Turkish History Thesis and to propagate it. At the Congress, it was decided to initiate research projects to produce scientific evidence in support of the Thesis. In this period, positivism was highly valued by the intellectuals of modern Turkey and scientists gained a remarkable degree of political influence. In particular, anthropology and archaeology, as the positivistic sciences of human past, had a double potency to provide factual basis for a nation's imaginative past and to place its national history within the universal history of civilizations (Atakuman 2008). While archaeology

was an ideal discipline to reveal the ancient lines of descent from glorious civilizations, physical anthropology was ideal to prove descent from a distinguished race.

Soon after the First Congress, a unique Language, History, and Geography Faculty (*Dil ve Tarih, Coğrafya Fakültesi, DTCF*) was established at Ankara University, in the new capital city of the Republic, under the direction of Atatürk. The Anthropology Research Center from Istanbul moved to this location with its full staff, materials, and equipment, and a laboratory was founded where skeletal remains were curated. The Research Center became an Anthropology Department with physical and cultural anthropology divisions. The research projects undertaken by this department included the study of archaeological human remains, searching for and studying fossils, prehistoric site surveys, and lithic studies (Kansu 1940). The Turkish Historical Society initiated several archaeological excavations, which were funded by the state and directed by Turkish archaeologists. From 1930 onwards, Turkish anthropologists began to participate in archaeological excavations, as well.

In 1937, an enormous anthropometric research project was conducted under the direction of Atatürk, in which 64,000 people from all over Turkey were measured by numerous medical staff and teachers (İnan 1947). The aim of the study was to determine the racial characteristics of the Turkish population. İnan presented this study as her PhD Thesis at Geneva University in 1939, under the supervision of Eugene Pittard. Pittard stated that this anthropological inventory initiated by the Turkish State was an unequalled effort in world history (İnan 1947). For the survey, which constituted the basis of İnan's dissertation, the government had not only allocated considerable money from the state funds, but had also placed the staff of the Ministries of Health, Education, and National Defense at İnan's service (İnan 1947). İnan's study was conducted on the living population of Turkey. İnan concluded in this study that (1) the Turkish race was homogenous (2) there was little influence of the Mongoloid races, and (3) in general, Turks belonged to the Alpine race.

The Second Turkish Congress of History took place in 1937 in Istanbul. Physical anthropologists, linguists, and archaeologists from different European countries were invited to the meeting. The purpose of the Second Congress was to share the archaeological and anthropological evidence for the Turkish History Thesis with the international scholars in attendance. Tanyeri-Erdemir (2006) states that this second meeting aimed to show the world how Turkey had became a modern nation-state with a proud history and with good scientists, capable of investigating their own past. However, there were also some critics against the arguments of the Thesis at the Congress. The Second Congress was the last international platform at which Turkish researchers supported the Thesis.

Post-World War II Regression in Anthropological Research and Revival of the Discipline in the 1990s

After the Second World War, the political atmosphere had changed in Turkey and the Turkish History Thesis became outdated. The publication of İnan's dissertation in 1947 by the Turkish Historical Society can be seen as the last effort to promote the ideology of the early Republic, although the idea had already lost its validity by this time (Aydın 2000, 2001). In the post-war period, the racial emphasis of Turkish nationalism gradually diminished and was transformed into a cultural and ethnic nationalism (Aydın 2005).

During the 1940s, the popularity of physical anthropology diminished significantly as government support was withdrawn from anthropological research (Özbudun Demirer 2010). Having lost its relevance for the sociopolitical agendas of the country, the physical anthropology department at the Language, History, and Geography Faculty became marginalized (Aydın 2000, 2001). In the post-war environment, the racial paradigm of the early twentieth century in physical anthropology was abandoned in Europe and around the world. It is interesting to note, however, that the practice of physical anthropology in Turkey continued to be restricted to cranial morphology and descriptive analyses of human skeletal remains as late as the 1980s (e.g. Çiner 1965; Tunakan 1971), mainly due to the fact that Turkish anthropologists remained isolated from the practice of physical anthropology around the world and continued to produce in the only one scholarly tradition that they knew. Until the establishment of an anthropology department at Hacettepe University in Ankara in 1976, the department at the Language, History, and Geography Faculty remained the only institution for physical anthropological research and training in Turkey for forty years.

In the 1990s, as part of the Turkish state's efforts to join the European Union, several new universities were established in Turkey, some of which also included anthropology departments. This initiative was followed by the establishment of more universities in the 2000s with new anthropology and archaeology departments and physical anthropologists were employed in some archaeology departments, as well.[6] Another new initiative in this decade was the National Biological Anthropology Meeting (*Ulusal Biyolojik Antropoloji Sempozyumu*), which first took place in 1996, and the fourth meeting was held in 2010 in Ankara. Before this convention, physical anthropological studies were presented only at the Archaeometry branch of the annual "International Excavation, Survey and Archaeometry Symposium in Turkey" organized by the Ministry of Culture.

In the 1980s, significant palaeoanthropological excavations were initiated in Turkey at Miocene fossil sites such as Paşalar, Bursa (Alpagut 1990) and Çandır, Ankara (Güleç and Begun 2003). In the following decades, upon the return from the USA of the renowned Turkish forensic anthropologist Mehmet Yaşar Işcan,

[6] For details see Üstündağ (2011).

forensic anthropology advanced as a new field in Turkey, as well, most notably at the Institute of Forensic Medicine in Istanbul and the Department of Physical Anthropology in Ankara (Güleç and Işcan 1994). With this line of research, Turkish anthropologists began to interact with the international anthropological community. Since late 1990s, Turkish anthropologists have been increasingly publishing in international periodicals. These publications focus on specific issues pertinent to archaeological human remains in Turkey, such as palaeopathology (e.g. Özbek 2005; Erdal 2006; Uysal 2006a, 2006b; Üstündağ and Deveci 2011), dental anthropology (e.g. Özbek 1995; Erdal and Duyar 1999; Duyar and Erdal 2003; Erdal et al. 2006; Koca Özer et al. 2006; Öztunç et al. 2006; Erdal 2008), skeletal morphology (e.g. Özer et al. 2006; Özer and Katayama 2006; Güngör et al. 2007), non-metric skeletal variations (Eroğlu and Erdal 2008; Eroğlu 2010), cultural cranial deformation (Özbek 2001), trephination (Erdal and Erdal 2011), trauma (Erdal 2012), and trace element research (Özdemir et al. 2010).

Conclusions and Routes for Future Research

As we have reviewed above, the establishment of physical anthropology as a scientific discipline in Turkey was a direct outcome of the foundation of the Republic. Until the 1940s, it was believed that the discipline was essential for determining the biological/racial identity of the Turkish nation. As such, the institutions for physical anthropological research were directly founded by the state, and anthropological research on the modern and ancient populations was generously supported by the government. However, "racial identity" lost its value in the changing political climate in Turkey after the 1940s, which led to a long quiet period until the 1990s and Turkish anthropology remained isolated from the international arena despite its long history. In the 1990s, with the foundation of several new universities and active collaboration between archaeology and anthropology departments, physical anthropology became a more vibrant field and specific, question-oriented research agendas gradually replaced the earlier deterministic studies. Today, Turkish researchers are joining international associations and increasingly publishing in international journals with scientific standards.

The national territory of the Republic of Turkey, encompassing Anatolia and eastern Thrace, has hosted a multiplicity of cultures and witnessed multiple episodes of demographic movements through the ages. As a result, many archaeological sites in Turkey contain multiple habitation levels dating to distinct cultural periods of ancient history. However, given the discrete disciplinary histories of various periods in European and Turkish academic traditions and the period focus of many scholars (such as Prehistory, Ancient Near Eastern Archaeology, Classical Archaeology, and Medieval Studies) as well as the identity politics discussed above, the human remains from various phases of the archaeological record of Turkey have received relatively little attention.

Archaeological excavations at classical Greek and Roman sites in what is now Turkey began in late nineteenth century, during the period of Ottoman imperial rule. These were undertaken by various European archaeology institutes as well as by the Istanbul Archaeology Museum. However, since these excavations were focused on uncovering monumental architecture, sculptures, and small objects worthy of display in museums, human skeletal remains were generally discarded. In the 1930s, Turkish archaeologists and physical anthropologists focused their efforts selectively on preclassical cultures of Anatolia, such as the Hittites, who could be characterized as the distant ancestors of "the Turkish race" in support of the Turkish History Thesis. Skeletal series from these early excavations were studied with great care and curated in museum collections. In subsequent decades, archaeological research on classical Greek and Roman sites revived. This involved the active collaboration of many Turkish scholars who had completed their higher education in German universities. This research had the financial support of the Ministry of Culture as the potential of these sites for augmenting foreign tourism was recognized. However, this revival coincided with the dormant period of physical anthropology between the 1940s and 1990s, during which the study of skeletal remains at many excavated sites was neglected, regardless of cultural affiliations. Archaeological work at Byzantine and Islamic sites of the Medieval Ages was much delayed in Turkey, since these periods have been generally regarded as a subject of study for historians.[7] Skeletal series from the Ottoman period are almost entirely absent from museum collections as the archaeology of this period is a newly emerging field in recent decades.

As a result of the academic departmentalization in Turkish universities, research agendas and methods of physical anthropology have been incorporated in prehistoric studies. In contrast, Classical Archaeology has assumed a more art historical approach and the study of human remains has rarely been on the agenda of expeditions to classical sites. It can be said that the latest levels of occupation dating to Medieval and Ottoman periods on multilevel habitation mounds in Turkey and neighboring countries have suffered the most from the discrepancy of research methods and lack of communication between different academic departments. In many archaeological excavations at significant prehistoric and Bronze Age sites, later levels of habitation and cemeteries have been removed without meticulous recording in order to reach earlier habitation levels that are the primary target of the research agenda of the expeditions. As for the Greek and Roman period sites with monumental remains, their visibility have made them an easy target for extensive looting activity fueled by the antiquities trade, which has resulted in the disturbance of graves and loss of human skeletal remains.

The archaeological record of Turkey bears great potential for various issues pertinent to biological anthropology: to begin with, the Miocene primates,

[7] Excavations at Saraçhane in Istanbul, conducted in 1960s by Dumbarton Oaks and the Istanbul Archaeological Museum can be cited as the first notable excavation of a Byzantine site. Human skeletal remains from this excavation have been studied by Brothwell (1986).

Palaeolithic *Homo erectus* (Kappelman et al. 2008), *Neanderthal* (Şenyürek 1949), and Upper Palaeolithic human remains[8] discovered in Turkey have a lot to contribute to the debates on human evolution. Turkey also hosts some of the earliest Pre-Pottery Neolithic settlements, which shed light on anthropological issues surrounding the transition from hunter-gatherer to sedentary and agricultural communities. Although research on Neolithic skeletal series has a long history in Turkey, research agendas of physical anthropologists have only recently begun to go beyond descriptive publications and are converging with the research agendas of anthropological archaeology, such as changes in dietary regimes, the impact of sedentary life on health and stature, as well as the emergence of hybrid populations and a new demographical profile. In this sense, the new campaign of excavations at Çatalhöyük under the directorship of Ian Hodder can be seen as a promising model for collaborative research, where the research agendas of various specialists are integrated to bring forth a comprehensive understanding of the Neolithic society at the site.[9]

Archaeological excavations at Bronze Age sites in Anatolia have been yielding a complete array of permanent settlements of various sizes, but also of rich extramural cemeteries which reflect diverse mortuary customs. The rise of urbanism, economic specilization in craft production and trade, crystallization of political authority, interpolity competition and violence, as well as the creation of multi-ethnic complex societies emerge as important anthropological issues for this period. Physical anthropological research on the skeletal series from Bronze Age sites will contribute immensely to our understanding of these complex societies, if the analyses target questions such as the impact of craft specialization, metallurgical production, economic inequality, differences in social status and the changing gender roles on diet, health, and life expectancy. Moreover, a contextual evaluation of these factors in conjunction with genetic traits and isotope analyses seems like a promising research direction for establishing a more fluid understanding of ethnic and cultural identity as an alternative to the racial paradigm of the earlier decades.[10] And finally, Turkey hosts innumerable classical Greek and Roman sites with extensive cemeteries, as well as medieval sites of the Byzantine and Islamic periods, which have received less attention. These late period sites have yielded large skeletal series, which have great potential for the study of health, diseases, trauma, diet, social status, occupation, migrations, and hybridization of populations, which can be guided by and supported with textual sources.

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[8] For Upper Palaeolithic human remains at Üçağızlı Cave at Hatay, Turkey see http://web.arizona.edu/~hatayup.

[9] http://www.catalhoyuk.com.

[10] Strontium and Oxygen isotope analyses around the world has contributed immensely to our understanding of human mobility over great distances, as well as immigration of small human communities and the integration of culturally distinct groups, all of which are pertinent to creating a more realistic understanding of cultural and ethnic identity in Turkey. Sr and O isotope research is at a pioneering stage in Turkey. Welton's (2010, in press) dissertation on Ikiztepe cemetery and Yazıcıoğlu's ongoing dissertation research on Kültepe (Kaneš) can be cited as examples.

As we can observe from the narrative presented above, the demographic complexity of Anatolia continues to present a challenge to physical anthropologists, archaeologists, and ancient historians. Given the location of Anatolia, neighboring as it does with Mesopotamia, the Caucasus, the Black Sea basin, Greece, and the Balkans, it is necessary to establish correlations between the skeletal series of Anatolia and neighboring regions in order to establish regional standards and to shed light on past human migrations. Osteological studies in Turkey have accelerated considerably in the last decade and have begun to converge with current biological anthropology paradigms in international circles. On the other hand, however, interdisciplinary studies in this field are still at a nascent stage and need to develop further. Immediate needs in the field are standardization of methods and establishment of a database for archaeological skeletal series. Above all, we believe, biological anthropology in Turkey will benefit immensely from communication between foreign and Turkish scholars and the development of interdisciplinary collaborative projects.

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Chapter 16
Bioarchaeology as a Process: An Examination of Bioarchaeological Tribes in the USA

Gordon F. M. Rakita

> *Bioarchaeology clearly has grown into a well-established method for investigating past populations in many areas of the world.*
>
> Perry and Buikstra (2012: 1)

> *Bioarchaeology is currently experiencing growth in a number of regions of the globe, but nowhere is the growth as explosive as in North America.*
>
> Larsen (2002: 145)

Introduction

We are slightly over 35 years after the original definition of bioarchaeology by Jane Buikstra at a small regional anthropological conference. From that humble beginning, a vibrant interdisciplinary approach to human burials and the skeletons they contain has developed. As the scholars quoted above indicate, bioarchaeology is now a well-established methodology in the USA and one that is growing in terms of both practitioners and research results. We are thus now in a position to assess the field's development and evolution. Clearly, there have been significant connections, contiguities, and parallelisms between bioarchaeology as practiced in the USA and throughout the world. Indeed, this volume speaks to these connections. However, here I take as my task a brief summary of the history of bioarchaeology principally in the USA. Histories of the field now abound (Agarwal and Glencross 2011; Armelagos and Van Gerven 2003; Buikstra and Beck 2006; Larsen 2002; Zuckerman and Armelagos 2011). Additionally, views of bioarchaeology's development in the USA from outside North America also exist (Knüsel 2010). I do not attempt to synthesize or otherwise summarize these perspectives, but rather offer one of my own.

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I begin with an examination of how bioarchaeology has grown in the USA, from fairly meagre beginnings to its current popularity. Then, I discuss the way new bioarchaeologists are trained in the USA. How one views and describes the history of a field is dependent upon how one defines the field. Therefore, I next discuss how various scholars have defined bioarchaeology and what sorts of scholarship and publications are included under the moniker of "bioarchaeology". In doing so, I discuss academic lineages and two "tribes" of bioarchaeology that I perceive to have developed in the USA. Finally, I end with a summary of recent trends in contemporary US bioarchaeology.

The Growth of Bioarchaeology in the USA

The history of bioarchaeology in the USA begins in the late 1970s and early 1980s. As numerous histories of the field (Armelagos 2003; Armelagos and Van Gerven 2003; Buikstra 1991; Buikstra and Beck 2006; Zuckerman and Armelagos 2011) have acknowledged, the theoretical underpinnings of the approach are twofold. The first influence was the "new" physical anthropology promulgated in 1951 by Washburn. Washburn called for problem-oriented, population studies rather than typological or merely descriptive approaches. While Washburn's call occurred 25 years before Buikstra coined the term "bioarchaeology" he clearly spurred a similar emphasis on populations and focused research design in bioarchaeology. Equally influential was the "new" archaeology of Binford (1962). Now usually referred to as processual archaeology, this theoretical reaction to what was seen as the sterilely descriptive Culture–History approach in North American archaeology revolutionized the field. Binford's approach drew its inspiration from neo-evolutionary approaches in anthropology which saw culture as "man's extrasomatic means of adaptation". Moreover, Binford (1971), along with Saxe (1970) and Brown (1971), re-awakened a long-dormant interest in analysis of human funerary practices grounded in social theory (see Rakita and Buikstra 2005). To these two theoretical developments, Buikstra (1977) called for an interdisciplinary methodology with a regional-scale focus. She also called an approach that brought archaeologist and physical anthropologists together to collaboratively design research projects that spoke to anthropological questions.

In the USA today, bioarchaeology is experiencing a period of methodological innovation, intense theoretical discourse, and phenomenal growth in practitioners and publishing output. Larsen (2006: 373) is right that "Bioarchaeology is enjoying a period of robust growth". However, the contemporary frisson over bioarchaeology is a relatively recent affair. For much of bioarchaeology's 35 year history, publishing output was modest. Moreover, Buikstra's call for bioarchaeologists to move from laboratories and appendices to be integrated and active participants in project design was rarely followed. That North American bioarchaeology experienced a rather long "adolescent" period is borne out by examinations of publishing trends.

In an effort to quantify the growth of bioarchaeology in North America, I conducted an EBSCOhost database[1] search for publications that contain the term "bioarchaeol*" in either their title or their abstract. I refined my search to peer-reviewed publications. The results included articles, book reviews, published abstracts, and review essays; I excluded dissertations and duplicate entries were removed. In all, the results included 615 citations published in a wide range of international, nation, and region journals including the *American Journal of Physical Anthropology* (representing 30 % of the publications, no doubt due to its publishing of conference abstracts), *Journal of Archaeological Science* (5 %), *American Anthropologist* (3 %), and *American Antiquity* (3 %) among many others. Obviously, such data can only capture a portion of the scholarly output of US bioarchaeologists. It does not include those works published as chapters in edited volumes, and this is a venue popular among adherents to newly emerging fields given the sociology of peer-review processes. It also does not take into account the fact that many early adherents may not have utilized the terms "bioarchaeology" or "bioarchaeological" in their titles or abstracts given the novelty of the field. Thus, my data do not capture every bioarchaeological publication over the 1973–2013 time frame, but should represent broad scholarly trends, especially as book reviews of bioarchaeology-themed volumes and abstracts are included in the data. These data are presented in Fig. 16.1. To this I have added indications of when key publications or events in the history of US bioarchaeology occurred.

The data show a long period of limited explicitly bioarchaeological publications in journals, and a review of the publications in the early period shows that many are using the term bioarchaeology as coined by Clark (1972) to refer to the study of non-human, organic materials recovered from archaeological sites. After 1977, there is a two-decade long period of anaemic peer-reviewed publishing despite considerable methodological developments. For example, in (1981), Ortner and Putschar publish their classic reference on pathological conditions in human skeleton that built on earlier contributions by Steinbock (1976) and Jarcho (1966). Another example is Bocquet-Appel and Masset's (1982) "Farewell to Paleodeomography" article which prompted decades of debate over the usefulness and paleodemographic techniques and (ironically) productive methodological developments (Frankenberg and Konigsberg 2006). Other important methodological developments included the use of chemical analysis of archaeologically recovered tissues. Trace elemental analysis was already being explored in the late 1970s (e.g. Robbins 1977); however, I mark its emergence in Fig. 16.1 with the 1986 School of American Research seminar later published as *The Chemistry of Prehistoric Human Bone* (Price 1989). Nor did this 25-year period (1977–1997) suffer from an absence of examples of important questions that bioarchaeological research could address. As but one example, I indicate on Fig. 16.1 the 1984 publication of *Paleopathology at the Origins of Agriculture* by Cohen and Armelagos.

[1] EBSCOhost draws from the Social Science Citation Index, Science Direct, Science Citation Index, Academic Search, and publisher provided full text and other sources.

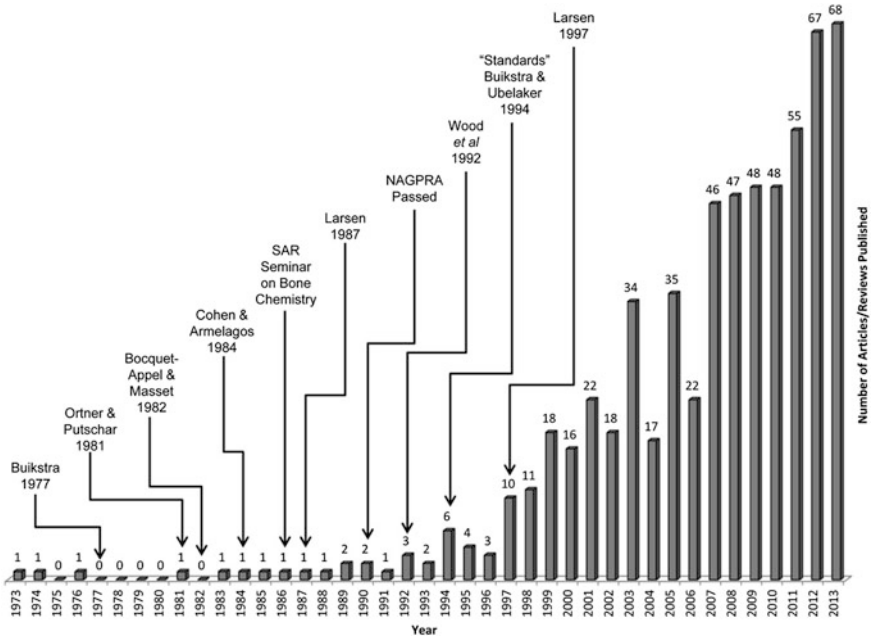

Fig. 16.1 Publications by year and significant events

The various contributions in this influential work examined the impacts to health caused by the Neolithic shift from foraging to food-producing subsistence strategies a key research agenda of both early and contemporary bioarchaeology (Armelagos 2003; Bocquet-Appel and Naji 2006). This adolescent period also saw highly visible explications of the field containing examples of its promise, such as Larsen's (1987) frequently cited article in the Advances in Archaeological Method and Theory series.

Despite these various methodological contributions, the field was generally unresponsive in terms of publication quantity in journals. This observation is mirrored by Goldstein's (2006) analysis of journals where she found limited sharing of knowledge and different "trajectories" for archaeology and physical anthropology. In 1991, *What Mean These Bones*?, an edited volume of bioarchaeological studies from the American southeast is published and the editors lament (Powell et al. 1991: 1):

> Despite the number of ongoing archaeological projects that include research on human skeletal remains, few are characterized by active collaboration between archaeologists and physical anthropologists from the planning stages onward. An unfortunate lack of coordination in research goals, sampling strategies, and recovery methods is the common result, with neither group realizing the maximum return for their efforts.

At the time, Powell and colleagues noted that while bioarchaeologists were publishing in AJPA, these reports were rarely read by archaeologists. Similar concerns were echoed by Chase (1994) in his review of the volume:

> That the book stimulates a dialogue between archaeologists and physical anthropologists is not entirely convincing. Only two of the papers deal with both material culture and biological data. The rest leave both groups firmly entrenched within their individual disciplines. Jane Buikstra, in the concluding chapter, indicates that, despite a great deal of effort on the part of bioanthropologists, mutually designed research strategies with archaeologists remain an elusive goal.

The data in Fig. 16.1 indicate that bioarchaeology's growth (as measured by peer-reviewed publications and book reviews) included a considerable juvenile and adolescent period. Certainly, in its first two decades of "life", the discipline saw few publications in journals read by North American scholars.

The significant upswing in bioarchaeology publications noted in Fig. 16.1 occurs after 1997[2] the year Larsen publishes his volume. Prior to this, though, were two linked events that no doubt had an important role in setting the stage for the post-1997 explosion in bioarchaeological publications. These two intertwined events are the 1990 passage of the Native American Grave Protection and Repatriation Act (NAGPRA) and the publication in 1994 of *Standards for Data Collection from Human Skeletal Remains*. The face of contemporary bioarchaeology in the USA is much influenced by NAGPRA. The Act not only transferred ownership of all Native American remains recovered from federal lands or under federal permit to tribal governments but it also required most federal museums (or those institutions receiving federal funds) to complete inventories of their native collections (skeletal and funerary). Buikstra (2006b: 398–402) describes how inventory efforts were hampered by lack of necessary funds, personnel, and acrimonious debates over how to define "cultural affiliation".

However, in 1990, NAGPRA-prompted inventory efforts were no doubt hampered by the lack of a commonly agreed upon data collection standards for human skeletal remains existed. Recognizing the increasing Native calls for repatriation of remains during the 1980s, the Paleopathology Association began the process of formulating common standards. These were published in 1991. A seminar at the Field Museum of Natural History that same year resulted three years later in the publication of *Standards* (Buikstra and Ubelaker 1994). I would suggest that though the data in Fig. 16.1 provide only indirect evidence of, the significant increase in explicitly bioarchaeological work published after 1996 is the result of (1) NAGPRA-prompted inventorying of skeletal collections and (2) the common data collection protocols outlined in *Standards*. Simply put, NAGPRA forced data collection from and aggregation of information from both human skeletons and their associated funerary objects. This vastly increased the amount of data

[2] A similar upswing in the use of the term "bioarchaeology" can be viewed in a Google Ngram Viewer analysis: http://books.google.com/ngrams/graph?content=bioarchaeology&year_start=1960&year_end=2008&corpus=15&smoothing=3&share=.

available to bioarchaeologists. Indeed, bioarchaeologists whose careers matured in the late 1990s were no doubt trained in bioarchaeological techniques at institutions where recordation was a visible and high-priority effort. They may even have participated in the process themselves as graduate students. The publication of *Standards* facilitated the recordation process and established common data conventions that also eased comparisons of osteological data from multiple sources (both institutional and archaeological).

What is not in doubt is the impressive outpouring of bioarchaeological research being published since 1996. While Fig. 16.1 gives a graphic picture of this upswing in journal publishing, the trend is not contained to those venues. Indeed, nationally recognized academic presses are publishing more and more bioarchaeology-themed volumes each year, and some like University Press of Florida have established book series. Methodological advances have continued to propel the approach including the use of heavy isotopes and advances in ancient DNA to examine population migration and biological affinity. Other trends emerge out of renewed engagement with anthropological and other social theory trends, and I discuss these below. However, the increasing visibility of bioarchaeology has attracted criticism of the approach from both outside and within the field. For example, Zuckerman and Armelagos (2011: 15–16) correctly identify the critique of fields like bioarchaeology from scholars like Segal and Yanagisako (2005) who see such biocultural approaches as being reductionist, evolutionary, adaptationist, and racist. Zuckerman and Armelagos dismiss such critiques as based on misinterpretations of the biocultural perspective and brands current proponents of this view with the racist "original sins" of earlier anthropologists [see Schultz (2009) for a similar defense]. Yet, denunciations of bioarchaeological practice also come from within the field. For example, Armelagos and Van Gerven (2003: 61) in discussing recent methodological debates within bioarchaeology express concern that such debates are driving younger bioarchaeologists towards racist or typologically descriptive work that characterized skeletal biological studies of the first half of the twentieth century:

> Many students, believing that bioarchaeology has been mortally wounded, shy away from both the risk and the controversy by pursuing more conservative research. Our point is this: Criticisms of bioarchaeology and biocultural reconstructions do not require a retreat back to race, descriptive typology, and diffusionism.

In the same publication, Armelagos and Van Gerven point out that criticism and debate are not only signals of, but necessary to "a vibrant science". Thus, we may conclude that given robust publishing numbers and healthy debate both within the field and the discipline generally, bioarchaeology has left the growing pains of its adolescence and is in the full flush of young adulthood.

Training of Bioarchaeologists in the USA

How bioarchaeology is practiced in the USA is strongly influenced by the nature of how new bioarchaeologists are trained. Due to the history of how anthropology emerged in the USA, the four field of archaeology, physical anthropology, sociocultural anthropology, and linguistics are bundled into one department at most institutions. While the four-field faculty at most small, non-Ph.D. granting institutions must by necessity regularly interact and collaborate on curriculum to train undergraduates, the same cannot be said of the universities training graduate students. At large, research-intensive graduate programmes in the USA, the faculty in the four fields typically maintains separate curriculum for their graduate students. While some may require a common core course or two, the majority of a student's courses are drawn from only one of the subfields. Interdisciplinary students like bioarchaeologists in such a setting are required to declare their official membership in one of the four fields and cobble together cross-field training in an ad hoc, haphazard fashion.

For the bioarchaeologist, this typically means declaring oneself as an archaeology or physical anthropology student. The results of this curricular siloing are bioarchaeologists with heavy training in one side of the bioarchaeology spectrum and limited training in the other side. Students receive the vast majority of their training within one subfield. Those who recognize the equal importance of competency in both subfields seek out as much additional training in the other subfield as is possible given time, financial, and credit hour constraints. Many bioarchaeology students seek out thesis committee members from the opposite subfield in order to gain the insight from that subfield into their research. However, these are often stopgap measures.

The end products of this situation are physical anthropologist with some background in or experience with archaeology, but often without the theoretical sophistication to examine archaeological data critically or archaeologists with some knowledge of physical anthropology, but without the depth of methodological issues or experience. These two breeds of bioarchaeologists represent opposite and extreme poles of a spectrum or gradation, with any given bioarchaeologists falling somewhere in between. However, I think the point is still apt and appropriate. Most bioarchaeologists, and I include myself here, feel more comfortable on either one side of the archaeology–physical anthropology spectrum or the other. And this plays out in research agendas and in the job market.

Those who experienced the archaeology graduate training path received heavy doses of the history of archaeological thought. Indeed, they were inoculated with the multitude of theoretical paradigms that now exist in archaeology. They were trained in archaeological classification, sophisticated dating methods, and field techniques. They may have been encouraged to take course work in advanced quantitative methods, but most probably were able to pass their comprehensive exams without even being able to explain what a chi-squared test is. These students may have taken courses in human skeletal biology, but probably not

advanced work in paleopathology, demography, hominid evolution, human biological distance studies, or evolutionary theory. Upon graduation, these newly minted researchers often find employment in the Society for American Archaeology job listings. They are hired as archaeologists, published in *American Antiquity*, and their work often reflects interests in mortuary practices and ritual behaviour.

Those that passed through the physical anthropology path received an alternative training regimen. Typically, these students were concerned with only one theoretical perspective: evolution. They were trained and tested on their understanding of primate ecology and evolution, disease processes in humans, and hominid evolution. They were encouraged to complete laboratory work in DNA sequencing or recordation of human remains for NAGPRA purposes. Moreover, they were required to take advanced course work in quantitative analysis, discriminant function analysis, Monte Carlo simulations, ANOVAs, MANOVAs, PCA, and a variety of other acronym*ed* statistical procedures. However, these students were rarely exposed to ethnographic accounts of living human groups, theories of how mortuary ritual may impact the representativeness of a given skeletal series, or the issues surrounding sampling strategies in archaeological excavations. Upon completion of their degree, these students find jobs listed by the American Association of Physical Anthropologists, published in the *American Journal of Physical Anthropology*, and focus on health and disease or biological interactions within prehistoric populations.

Indeed, academic departments are not the only issue as other structural aspects of the anthropological field in the USA are at work as well. For example, research funding by the National Science Foundation is divided into archaeology and physical anthropology programmes. Thus, bioarchaeologists are subtly encouraged to tailor their proposals to one or the other of these venues. These structures make sense from an organizational and practical standpoint. However, they do have important consequences for bioarchaeology as a field. Additionally, the tremendous growth and success of bioarchaeology have made functional competency in all aspects of the field simply impossible these days. While in the last decades of the twentieth century, it may have been possible to someone to competently command the methodological and theoretical literature well enough to make contributions in both fields, and this simply is not possible. Goldstein notes (2006: 377):

> It is possible, and even likely, that some physical anthropologists have started to ignore archaeological data because physical anthropology has gotten complicated and requires such specialized training that researchers do not have time to do everything they have to do for their specific analysis, plus work with the archaeological data as well. It is also possible that archaeological data are different enough that they are hard to interweave into the osteological analysis. Archaeological data are often "messy", requiring more interpretation and more work than osteological data.

Training of bioarchaeologists is also influenced by the idiosyncrasies of the mentor–student relationship and academic lineages. In this way, bioarchaeology is not unique, as others have shown similar academic lineages in evolutionary biology (Hull 1988) and archaeology (O'Brien et al. 2005). A recent website is

dedicated to documenting the academic phylogeny of physical anthropologists (http://www.physanthphylogeny.org/). A review of the intellectual progeny of key bioarchaeologists shows that advisors have an influence on the approaches, methodologies, and research questions adopted by their students. These academic lineages also map rather robustly onto different "flavours" or approaches to bioarchaeological research. I discuss these below, and how the boundaries between these different "tribes" of bioarchaeologists are diminishing as the number of practitioners increases. Influential bioarchaeologists include Armelagos and his students from the University of Massachusetts—Amherst and Emory, Buikstra and hers from Northwestern, University of Chicago, University of New Mexico, and Arizona State University, Larsen and his from University of North Carolina and Ohio State University, and Walker and his students from the University of California—Santa Barbara. Interestingly, all four can trace their academic lineage back to Earnest Hooton (Buikstra and Walker through Merbs and Laughlin, Larsen through Wolpoff, Giles, and Howells, and Armelagos through Kelso, Theime, and Washburn). These are, of course, not the only institutions and advisors producing bioarchaeologists in the USA; however, these do represent prolific (in terms of both students and publications) centres of bioarchaeology.

Defining "Bioarchaeologies" in the USA

So how is bioarchaeology defined and practiced in the USA? Buikstra (2006a: 348) indicates that there is diversity in definitions of the approach. Moreover, those definitions have changed over time with some scholars presenting significantly modified definitions at different points in their careers. Zuckerman and Armelagos (2011: 19) point out that "Definitions of both the biocultural approach and bioculturally oriented bioarchaeology have shifted over the past three decades, following changes in research agendas and theoretical orientations in biological anthropology". The appendix presents a selection of definitions of bioarchaeology from Buikstra's (1977) original to those being presented by current scholars. A review of these definitions shows that bioarchaeologists, of all stripes, share several core concepts (Armelagos 2003; Buikstra 2006a). Most see bioarchaeology as an interdisciplinary endeavour that uses methodologies from archaeology and physical anthropology and allied fields. It is concerned with data derived from human burials. It is focused on regional, population-scale data. Finally, it is interested in understanding human adaptation from a biocultural perspective.

Agarwal and Glencross (2011) present an interesting history of bioarchaeology recognizing three broad "waves" of "theoretical engagement". The first wave is represented by "population-based bioarchaeological studies that strive to interpret indicators of health and disease as adaptive responses of the skeleton to large-scale change, such as shifts in subsistence, political or economic change, or periods of contact". Their second wave is characterized by studies employing "state-of-the-art technologies (like isotopic studies) and critical examinations of the

representativeness of skeletal samples (the "osteological paradox")". The third wave or "…current research seeks to integrate elements from biological, behavioral, ecological, and social research" and seeks to "transcend the skeletal body into the realm of lived experience and to make a significant contribution to our understanding of social processes and life in the past" (Agarwal and Glencross 2011: 3). Their historical reconstruction is interesting though I might suggest that their third wave is only a "current" development of bioarchaeology if you exclude from bioarchaeology examinations of mortuary practices. If mortuary studies that emphasize social theory are included as I and others (Buikstra 1991; Goldstein 2006; Torres-Rouff 2010) argue, then the integration of biological, behavioural, ecological, and social research is not a new or current development in bioarchaeology (contra Sofaer 2006).

Certainly, any categorization of bioarchaeologist will be an over-simplification. Such classifications de-emphasize subtly and nuance in each scholars approach. Moreover, they tend to ignore the fluid way that scholars publish collaboratively and may change publishing habits across their careers (e.g. see Rakita 2013). Goldstein (2006: 386) makes a similar point:

> Blakey (2001) makes an interesting distinction between what he calls the "biocultural" approach and the "forensic" approach in physical anthropology…his forensic approach is what I am concerned about with some of the current trends in bioarchaeology, and his biocultural approach is what I would call good bioarchaeology…I think this distinction is somewhat of an overstatement, and there are people trained by other individuals and institutions in the country who can be said to practice each approach, but his point is worthy of note in terms of the history of the discipline.

Nonetheless, rather than Agarwal and Glencross's three temporally successive waves, I prefer to view the different bioarchaeologies as falling into two "flavours" or tribes. These tribes can best be viewed as representing two ends of a spectrum. I also think that my camps take into consideration the intellectual lineages mentioned above. For a European view of these tribes, see Knüsel (2010) and Sofaer (2006).

The first of these tribes is what I will refer to as the "biological adaptation" tribe. This is the approach advocated by Larsen (1987, 2002). Practitioners of this sort of bioarchaeology often use "skeletal biology" or "osteology" as synonymous appellations for their approach. Their research questions usually revolve around assessments of the biological (or evolutionary) adaptation of human populations especially as it relates to health status and diet. Their utilized methodologies include almost the full range of bioarchaeology including paleopathology (both non-specific and specific), dental pathology and wear, investigations of growth and stature (and disruptions thereof), examinations of trauma and injury and activity patterns. They tend to ignore or pay limited attention to cultural, intentional body alteration (e.g. cranial modification). They eschew biological distance studies as racist, accept Bocquet-Appel and Masset's eulogy of paleodemography, and are largely unconcerned by Wood et al. (1992) osteological paradox. To the extent that they consider mortuary ritual at all, they tend to accept the Saxe-Binford approach to social status reconstruction for the deceased. Theoretically, this tribe seems to

have held onto the functionalist, systems, and adaptationalist approach of processual archaeology longest (Zuckerman and Armelagos 2011: 20). In Agarwal and Glencross's schema, these bioarchaeologists are represented by their "first wave".

This biological adaptation tribe is perhaps the most visible bioarchaeology in the USA. The popularity of the approach may be due to the prolific publishing of its adherents and strategic recasting of the nature of bioarchaeological research. As Goldstein (2006: 377) notes:

> Larsen has redefined bioarchaeology as something exclusive to physical anthropology—he sees it solely as the study of human remains recovered from archaeological settings (Larsen 1997, 2002). This is in dramatic contrast to the definition and interpretation of several other scholars [such as Buikstra's (1977: 69) "active participation of both archaeologists and physical anthropologists in all phases of research design"], but because of Larsen's impressive and prolific publication output, his definition has de facto become the most common, or at least the most ubiquitous, definition of bioarchaeology.

The second of my two broad "tribes" of bioarchaeology I call the "anthropological question" approach. These bioarchaeologists tend to ask a wide range of anthropologically relevant questions rather than evolutionary or adaptationist questions. In this way, they are much more concerned with cultural and social identity rather than simply health status. They are typically more interested in the context of skeletal remains, mortuary practices, body modification, and interpersonal violence. Methodologically, they are concerned with the representativeness of skeletal samples and are more likely to use heavy isotopes and bio-distance studies to examine population structure and movement. They continue to emphasize the archaeological side of bioarchaeology and emphasize for the need to be engaged in the planning stages of research design. They are also more likely to draw on theories from socio-cultural anthropology and embraced post-processual developments in archaeology, especially in mortuary practices. This tribe is best represented by Agarwal and Glencross's "third wave", though I would argue that far from being a new development, these bioarchaeologists represent a continuation of original formulations of the approach (Buikstra 1977, 1991) that were overshadowed by the "biological adaptation" tribe.

Regardless, it is clear from a variety of points of view (Agarwal and Glencross 2011; Buikstra and Beck 2006; Larsen 2010; Martin et al. 2013) that *rapprochement* is well underway as the number of practitioners grows (along with the number of academic lineages), diversity of methods increases, and research questions broaden in bioarchaeology. While the traditional centres of bioarchaeology training at Arizona State University, Emory, and Ohio State continue to produce bioarchaeologists (Phillip Walker of University of California—Santa Barbara unfortunately passed away in 2009), a number of new training ground have developed as student of these sites, and others have establish their own laboratories. For example, Debra Martin has established a very productive programme at the University of Nevada, Las Vegas as has John Verano at Tulane, John Krigbaum at the University of Florida, Dale Hutchinson at University of North Carolina at Chapel Hill, and Della Cook at the University of Indiana. As the

number of institutions producing Ph.D. in bioarchaeology increases, previously intellectually endogamous tribes become much more exogamous in their sharing of ideas, research questions, and methodological advances.

Recent Trends in US Anthropology and Bioarchaeology

The number of bioarchaeologists in the USA is growing exponentially as traditional and new centres of bioarchaeology training continue to produce Ph.D. students. In the context of the general decline in hiring in higher education in the USA, bioarchaeologists are attractive applicants as they often can teach a spectrum of courses from archaeology to physical anthropology. As Martin et al. (2013: 250) note "There are jobs in bioarchaeology" and bioarchaeologists are seen as attractive in part due to the interdisciplinary nature of their methodologies. In spite of this, and much like most academic disciplines in the country, the field is confronted with the problem of defining its relevance to both the rest of academia and especially the public (Stojanowski 2013). Given that its approach to issues spans the sciences, social sciences, and the humanities (as US Anthropology has traditionally been envisioned), one would expect it to possess the methodological tools to address issues confronting humanity today.

However, as mentioned above, the foundations of four-field anthropology are currently under attack especially the biocultural perspective (Segal and Yanagisako 2005; see also Goodman 2013). These critiques often include a rejection of US four-field anthropology as a "myth" (Borofsky 2002). Embedded in this rejection of four-field anthropology is the assumption that physical anthropology still maintains the taint of racism thus further justifying its division from the rest of the field (Rakita 2010). These attacks come during a period of recent controversies about the role of science within the field (Wade 2010) including the exclusion of the term "science" from a draft of the American Anthropological Association's long-range planning document. I believe these currents within the field of anthropology in the USA go a long way towards explaining why physical anthropologists (and by extension bioarchaeologists) have shied away from publishing venues like *American Anthropologist* (Chibnik 2013: 357) and why there is declining participation by bioarchaeologists in the American Anthropological Association. Ironically, the current editor of the *American Anthropologist* emphasizes that papers in the journal "should be understandable to non-specialists and discouraged the extensive use of terms unfamiliar to most readers. This poses particular problems for biological anthropologists …(who) need to be particularly careful to write in a way that is comprehensible to the generalized readership of the journal". Yet, no similar admonition is made to socio-cultural anthropologists that they make their work understandable and relevant to physical anthropologists. I would argue that such attitudes, expressed in the flagship anthropological journal in the USA, have needlessly alienated many bioarchaeologists. The implication is that bioarchaeologists and other physical anthropologists much reach out to others

in the discipline, while no similar hand need be extended in our direction. Furthermore, these attitudes establish socio-cultural anthropologists as the anthropological "us" whose work is relevant de facto versus the bio-cultural anthropologists "other" whose research must be justified. The result is the further ghettoizing and delegitimizing of the bio-cultural portion of the field.

In the meantime, prominent archaeologists like Sabloff (2011) are advocating for anthropologists to increase their engagement with the public. Bioarchaeologists both in the USA and outside are answering the call by, for example, blogging about their research and the research questions bioarchaeological methods can answer (Rakita 2011). Further, these research questions are increasing relevant to present-day populations. Indeed, as Armelagos (2003: 32–34) reminds us, many perennial bioarchaeological research questions have contemporary significance; "Bioarchaeology is at the forefront in documenting the evolution and adaptation of human populations and the disease consequences of changes that occur". Cases in point are recent bioarchaeological studies of tuberculosis (Roberts and Buikstra 2008) and syphilis (Harper et al. 2011; Powell and Cook 2005; see also Zuckerman 2012). Armelagos (2003: 33–34) also speaks to the role bioarchaeology can play in examinations of human nutrition and bioarchaeology's unique perspective on the history and interplay between human populations and their subsistence practices. Bioarchaeological analysis of past human nutritional diseases provides important insight to how our cultural and social lives can significantly impact our overall health.

Similar connections between emerging foci of study in bioarchaeology and contemporary global issues impacting human exist. Amidst the reconciliation of the two "tribes" of bioarchaeologists discussed above or perhaps because of it, bioarchaeological scholarship and the research questions we are asking are experiencing a renaissance (e.g. Knudson and Stojanowski 2008; Martin and Harrod 2012). As Agarwal and Glencross (2011: 8) note "Contemporary bioarchaeologists are much more engaged with social theory as they strive to better connect the biology and social construction of the skeleton. Easily stemming from this and ethics in archaeology is the growing interest in the practice of a bioarchaeology that involves community outreach and consideration of multiple stakeholders".

In recent years, bioarchaeology has seen increased interest in issues relating to sex and gender (Geller 2005, 2009a, b; Stone 2012) and children (Perry 2005). Identity, both cultural and biological, is an emerging concern (Agarwal 2012; Knudson and Stojanowski 2009) as is ethnogenesis (Klaus 2008; Kurin 2012; Stojanowski 2010). Perry (2007) examines the relationship between history, historical archaeology, and bioarchaeology while Harrod (2012) springboards off of Walker's ethno-bioarchaeology which seeks to inform bioarchaeological analyses with ethnographic data. A renewed focus on detailed bioarchaeological analysis of the individual has developed (Stodder and Palkovitch 2012), deriving inspiration from Saul's (1972) osteobiography and Angel's (1946) social biology. Focusing on individuals also brings with it a concern with health across the life course and a renewed interest in bioarchaeologically identified instances of humans caring for

each other (Tilley 2012; see Buikstra 1981 for early use of bioarchaeology to identify a prehistoric case of care). As noted above, there is a long-standing interest in diseases and this shows no sign of decline. The "Osteological Paradox" continues to be debated and Wright and Yoder (2003) recently offered suggestions for productively overcoming some methodological hurdles. Bioarchaeological evidence for warfare and violence is seeing considerable attention (Martin et al. 2012; Martin and Osterholtz 2012; Tung 2012a; Pérez 2012). As I remarked at a recent Society for American Archaeology symposium, dietary reconstruction using light isotopes seems to be less common than preceding years, though not absent from the literature (Ambrose and Krigbaum 2003). Use of heavy isotopes to answer questions of migration and population movement is quite common (Bentley 2006; Tung 2012b).

Bioarchaeologists in the USA are also drawing methodological inspiration from Europe. Though a renaissance in bioarchaeology is ongoing in the USA, other world areas are likewise incubation centres for new methodologies, theories, and approaches. While twenty years ago, the USA could be rightfully identified as the origin for most bioarchaeological approaches, and the regions monopoly has ended. The UK, Commonwealth Nations, and continental Europe are important loci of developments influencing US bioarchaeology. For example, detailed excavation strategies and analysis of taphonomic signatures advocated by Duday's (Duday 2009; Duday et al. 1990) archaeothanatology or *l'anthropolgie de terrain* will certainly impact how burials are excavated and reported in the USA. Such detailed contextual information will allow further advances in bioarchaeological approaches to mortuary and ritual practices (Rakita et al. 2005) as well as better integration of archaeological and biological data (e.g. Robb et al. 2001; Martin et al. 2013). Hopefully, these will counter the trend in the early 1990s that cause so much concern for both Chase (1994) and Powell et al. (1991). Likewise, methodological advances in Europe (Bocquet-Appel 2002; Bocquet-Appel and Naji 2006) have spurred new examinations of the impact of the Neolithic transition in the USA (e.g. Kohler et al. 2008) and UK, and Australian scholars such as Lewis (2009) and Oxenham (2012) have contributed to the bioarchaeology of children.

Yet another influence from outside the country on US bioarchaeology has been the impact of Joanna Sofaer's embodied bioarchaeology. Sofaer (2006: xiii) sees two different ways human skeletons from archaeological contexts have been approached by osteoarchaeologists (as bioarchaeologists are known in the UK), namely:

> On one hand lie science-based osteological approaches that focus on the skeleton as the material remains of the body. While these approaches recognise variation between individual bodies, osteological conceptualisations are necessarily fixed, universal and transhistorical in order that the body may be subject to scientific analysis and comparisons between bodies made. On the other side lie approaches to the body situated in recent developments in social theory. These increasingly view the body as a social construction that is contextually and historically produced, but hardly touch on the human remains themselves.

In consequence, bioarchaeologists who follow one or the other of these approaches end up providing "an incomplete picture of the lived experience of the individual" (Martin et al. 2013). By advocating the integration of anthropological archaeology with osteology, Sofaer seeks to remind bioarchaeologists that human bodies are not simply material objects but also the result of historical and social contexts. Sofaer's approach has most successfully been applied to issues of age (Sofaer 2011) and sex/gender (Hollimon 2011) and has had an obvious impact on US bioarchaeology (Zuckerman and Armelagos 2011). However, one could argue that if my taxonomy of bioarchaeological tribes in the USA is accurate that the "Anthropological question" tribe identified above has been struggling to integrate Sofaer's two approaches for decades. Indeed, some of the works touted as examples of the "Body as Material Culture" school (see Martin et al. 2013: 216), for example those by Blom (2005) and Torres-Rouff (2002) both predate Sofaer's work and are by US scholars. Other US bioarchaeologists have similarly struggled with the dichotomy between sex and gender (e.g. Geller 2005). Regardless, it is clear that US bioarchaeologists now have a far larger community of colleagues to learn from and collaborate with both inside North America and out. With such a far ranging, intellectually vibrant set of avenues to pursue the future looks bright for US bioarchaeology. As Torres-Rouff remarked in 2010:

> Bioarchaeology, the study of human remains from archaeological contexts, has developed into a discipline focused on the human experience over recent decades. Once limited to appendices and discipline-specific journals, bioarchaeological research has become increasingly visible. As it matures, bioarchaeology has become a key locus of critical analysis and innovation in contemporary anthropology. A shift away from largely descriptive, site-specific inventories and toward analytical regional studies also signals the field's continued maturation.

Appendix: Various Definitions of Bioarchaeology

> A new form of regionally based, interdisciplinary research in mortuary site archeology and human osteology has been developed in the course of the present study. With the active participation of both archeologists and physical anthropologists in all phases of research design, members of our "bio-archeological" research group made the in initial decision to focus upon the investigation of biocultural change within the Woodland period.
>
> **Buikstra** (1977**: 69**)

> The purpose of this chapter is to provide a synthesis of recent advances made in bioarchaeology, an emerging discipline that emphasizes the human biological component of the archaeological record.
>
> **Larsen** (1987**: 340**)

> The approaches to bioarchaeological study discussed in this chapter should be seen as but a part of the larger issue of adaptation, which draws upon many sources of information,

including analysis of plant and animal food remains, settlement patterning, and ethnographic documentation. Through these other information sources we gain a more complete perspective on adaptation, but it is only through the study of human remains do we see the direct impact of lifeway on the individual during the periods of growth and development and of adulthood.

Larsen (1987**: 411**)

By presenting the specific conclusions and the broader anthropological implications of these case studies, we wish both to illustrate the wide variety of problem-oriented projects encompassed by the term "bioarchaeology" and to emphasize its active role in the advancement of anthropological inquiry.

Powell et al. (1991**: 6**)

…the term bioarchaeology I reserve for studies that focus on excavated archaeological populations.

Blakey (**2001: 388**)

Multiple different "bioarchaeologies" have been proposed throughout the 20th century) each differing in its foci, usage, and applications...

Zuckerman and Armelagos (**2011: 16**)

Bioarchaeology is premised on three primary components. These include the application of a population perspective; the recognition that culture is an adaptive force within human environments that is inextricably linked to biological adaptation; and the existence of methods for testing alternative hypotheses on the interaction between biological and cultural dimensions of the adaptive process.

Zuckerman and Armelagos (**2011: 21**)

The literature in bioarchaeology is large and growing…Bioarchaeology has its origins in human osteology, a field that pertains mostly to the anatomical study of skeletal remains.

Larsen (2002**: 119**)

The bioarchaeological perspective can be considered *distinct from the broader scope of research carried out on human remains, especially as compared to research often characterized as "skeletal biology". Chief among these differences is the extent to which culture and historical processes are central to the research interests of bioarchaeologists.* Grounded in particular culture–historical contexts, bioarchaeology generates hypotheses for evaluation that draw together the reciprocal influences of culture on human biology and vice versa, and examines such biocultural themes as the adoption of agriculture... the emergence of social complexity... prehistoric population movements, and contact between distant cultures...*Indeed, the goals of research are often more solidly derived from questions of archaeological than of biological origin*.

Wright and Yoder (2003**: 44, emphasis added**)

The promise of bioarchaeology required three factors: (1) a population perspective; (2) a recognition of culture as an environmental force effecting and interacting with biological adaptation; and (3) a method for testing alternative hypotheses that involves the interaction between the biological and cultural dimensions of adaptation.

Armelagos and Van Gerven (2003**: 58**)

Bioarchaeology is the scientific study of archaeologically recovered human remains. It is an endeavor that is regional and diachronic in scope, based in the analysis of populations as well as individuals. It is biocultural in outlook, explanatory rather than descriptive, and above all, emphasizes the scientific answering of anthropological research questions, not simply archaeological or physical anthropological ones. The approach is concerned with understanding human skeletal biology within the context of human social, funerary and ritual behavior. Bioarchaeologists use scientific methods developed in archaeology, physical anthropology, and allied fields.

Rakita (2005)

Bioarchaeology is a rapidly developing anthropological specialization in which researchers integrate osteological data from archaeological collections of human skeletal remains into comprehensive reconstructions of past human health, behavior, and population history…Using an interdisciplinary approach that incorporates methods and data from biological anthropology, archaeology, cultural anthropology, medical science, geography, history, and other related disciplines, bioarchaeologists formulate and test alternative hypotheses about human adaptation and change. This multidisciplinary strategy facilitates more accurate assessment and interpretation of osteological data, and the osteological data and interpretations in turn enhance the research of these specialists.

Buzon et al. (2005**: 871**)

…bioarchaeologists as social *and* biological scientists are well positioned to document, interpret, and contribute to understanding identity in the past especially at the individual and community levels—because they study the person's remains (the biological) and the mortuary and broader archaeological context (the social) from which these remains derive.

Larsen (2009**: xiii**)

Bioarchaeology, as defined by Buikstra (1977) and applied by contemporary scholars, encompasses more than simple description of skeletal material. It approaches anthropological research questions by integrating considerations of human remains with their context(s)—mortuary, environmental, sociocultural. Consequently, bioarchaeology goes beyond simple statements about mortality by offering insight into the experiences of ancient peoples. Moreover, it provides a multidisciplinary perspective on human life by consciously engaging with anthropological theory regarding cultural phenomena such as gender and class. The most successful contemporary bioarchaeological studies are theoretically grounded works that integrate biological and archaeological data to produce strong arguments about past groups.

Torres-Rouff (2010)

Bioarchaeology has developed and long used various biocultural models that emphasize the synergistic relationship of social, cultural, and physical forces in shaping the skeletal body.

Agarwal and Glencross (2011**: 1**)

…current research seeks to integrate elements from biological, behavioral, ecological, and social research. The goal of this new bioarchaeological practice is to transcend the skeletal body into the realm of lived experience and to make a significant contribution to our understanding of social processes and life in the past…While early studies in human osteology emphasized biological and evolutionary change, contemporary bioarchaeology is now clearly a discipline poised to engage with social theory.

Agarwal and Glencross (2011**: 3**)

> Bioarchaeology clearly has grown into a well-established *method* for investigating past populations in many areas of the world.
>
> **Perry and Buikstra** (2012)

> As a subdiscipline, bioarchaeology is emerging as a specialty that holds a unique place within anthropology, with one foot in biological anthropology and one foot in archaeology privileging each equally. However, bioarchaeology aims to be much more than a sum of osteological data plus archaeological context. As such, bioarchaeology is rooted in anthropological theory, and it has the potential as few other disciplines do to reveal important dimensions to the human life history that are currently unfathomable.
>
> **Martin and Harrod** (2012)

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Chapter 17
Archaeology, Bioethics, and Policies Regarding the Treatment of Ancient Human Remains in Venezuela

Franz Scaramelli and Kay Scaramelli

> *Silvestre knows about some Piaroa Indians who were buried in the vicinity. He agreed to help me, through payment, of course, to find their skeletons…. We hid our collection in the bush near the bank [of the river], where we will take it with us tomorrow when we leave. In this way no one in the town will know, except the chief, the nature of our cargo*
>
> (Voyages dans L'Amerique du Sud, Crevaux 1883 (1988): 271, 280).

In spite of the current popularity of the field of biological anthropology at the Universidad Central deVenezuela, the study of human remains in Venezuela has lagged behind other countries from the point of view of present-day standards on bioethics and human rights (Universal Declaration on Bioethics and Human Rights 2006). Ethical legislation has improved dramatically, but it is only a recent attempt to norm what in practice has been a long and different story. This is particularly evident in the treatment of human remains recovered in archaeological contexts, most of which derive from indigenous burials—although increasing work has been carried out in colonial and republican sites, as well as at contemporary sites of mass burial attributed to political violence (Rohde et al. 1993: 33–40). While other countries have made advances in establishing agreements aimed at protecting burial sites and cultural resources, the storage and study of human remains in Venezuela continue to suffer from a lack of awareness and forethought concerning ethically relevant issues and dilemmas about custody, repatriation, and research. Yet, as many indigenous groups and other minority sectors in Venezuela are beginning to show demographic growth and legitimate forms of cultural revitalization, a new

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phase in the negotiation of access to archaeological sites and skeletal remains is in the making. Encouraged by a Constitution (enacted in 1998) that acknowledges Venezuela's multiethnic heritage, native societies, ethnic groups, and other social factions are in fact waving the "cultural flag" in the legal domain. At the same time, official representatives of these minority sectors have been drafting instruments dealing with material and immaterial patrimony, human rights, and bioethics.

In light of these developments, this paper discusses the current trends regarding the study and custody of human remains found in archaeological contexts in Venezuela. To illustrate the discussion, we offer a synthesis of the history of archaeological and osteological research in Venezuela, in order to illustrate issues surrounding the politics of human remains. These examples will allow us to explore some profound ethical issues concerning attitudes commonly held by Venezuelan "Nationals" or "Criollos" (non-indigenous sectors of Venezuelan society) regarding Amerindians. The cases exemplify the interplay between the heritage of colonialism, racism, and post-colonial identity formation, as these affect government policies towards human remains, archaeological research, and indigenous rights movements.

The Origins of an Ethical Dilemma Regarding Bones

Between the fifteenth and eighteenth centuries, numerous European nations struggled for a foothold in the Antilles and the northern coast of South America, resorting to various forms of colonialism that differed in goals and strategies. The colonial process resulted in profound changes in the culture, economy, and forms of social organization of the local populations as well as those of the colonizers. In many areas, contact initiated drastic processes of population decline and socio-cultural transformations. The unfolding of the colonial process involved aggressive policies towards the Amerindian populations, including organized persecutions and practices of compulsive transformation. Although native systems of value and status were often reinforced and promoted during initial involvement in the colonial situation, the colonizers brought with them ideas and values of cultural and racial superiority that structured the relationships that evolved between colonizers and colonized through time.

The early conquerors and missionaries offered descriptions of the physical characteristics of the Amerindians, stemming from a concern for the determination of their human status and, later, once this issue was settled, out of a desire to establish their origins, classical or biblical, and possible relation to other peoples of the Americas and the rest of the world (Acosta 1992; Amodio 1993; Perera 1993; Todorov 1984; Trigger 1989). Several themes dominate these descriptions, such as the relative physical inferiority of the natives of the South American Lowlands in comparison with Europeans, Africans, and the indigenous peoples of Mexico and Peru, their lack of arts and culture, and their "moral depravity" as exemplified in supposed acts of sodomy, cannibalism, laziness, and guile (Acosta 1992). Even in

the earliest accounts, such as that given by Nicolas Federmann, in his "Narrative of the First Trip to Venezuela" (Federman 1962 [1557]), the "short stature" of the Amerindians is emphasized. In the early eighteenth century, Joseph Gumilla refers again to the stature and other physical characteristics of the indigenous people inhabiting the Orinoco River and offers arguments to uphold his belief that the Amerindians were among the cursed descendants of Ham (Gumilla 1944: Vol I: 112–118). Gumilla and other contemporaries perceived these primitive peoples as "monstrous" inferior races, physically weak and depraved, prone to drunkenness and other excesses. In particular, for the Catholic missionaries, these groups were considered to be irrational and in need of spiritual guidance in order to overcome their "wild and barbaric" state (see, for example Gumilla 1944, Vol. I: 100–101).

From a more enlightened point of view, Gilij, a Jesuit missionary stationed in the Orinoco in the second half of the eighteenth century, considered plausible an Asian origin for the Amerindians. He described the natives of the Orinoco to be varied in composition and robustness, while he deemed most of the men to be weak and effeminate due to a lack of adequate physical activity (Gilij 1987: Vol II: 296). These pervasive ideas, forged even before European colonial expansion in America, led to countless prejudices and practices concerning the indigenous population that have persisted in the popular imagination.

The history of issues concerning the treatment of human remains hails back to the sixteenth century when missionaries and other colonial authorities imposed Catholic burial practices and outlawed indigenous funerary rituals thought to be diabolical (see, for example Cassani 1967; Gumilla 1944; Poeck 1974). This persecution often involved public iconoclastic acts in which ritual paraphernalia, musical instruments, and masks were burnt or publicly ridiculed and destroyed (Bueno 1965: 153; Gilij 1987: Vol. II: 90), as well as the prohibition of ritual activities such as sacred dances and traditional burial practices (Bueno 1965; Gilij 1987: Vol. II: 238).

Attitudes began to change in the nineteenth century when European and Venezuelan explorers travelled throughout the country, gathering data on physical and cultural landscapes, resulting in many wide-ranging studies, reports, and personal diaries. A change in paradigm occurred, and biblical explanations were increasingly replaced by scientific interest in social and physical evolution, with interest on the effect of climate and other environmental factors on the physical development of the indigenous peoples living in the tropics. These concerns led these observers to visit ancient settlements and ceremonial and funerary sites where they expended considerable effort on the mapping of the unknown regions, as well as on the documentation of cultural forms such as dress, bodily ornamentation, pottery, rock art, and the collection of tales and myths about their significance and their utilization. One of the pioneers of the modern scientific expeditions, Alexander von Humboldt (1769–1859), devoted sections of his work (1985 [1807]) to the physical description of the local populations, advancing elements of comparison with respect to the physical appearance of other Amerindian populations. He posited the possibility that the peoples he encountered in the Orinoco were not the original inhabitants and that "regions, deserted today, had been in previous times,

populated by more active and intelligent races of man" (Humboldt 1985: Vol. 4: 208). Throughout the nineteenth century, explorers collected archaeological remains, made plaster moulds of limbs and faces, and acquired human skeletons that were later deposited in European museums of "Natural History", where many are still found today (Silva Monterrey y Soto-Heim 2002).

In the late nineteenth century and under the influence of the scientific revolution in Europe, Venezuelan investigators began to enter the field of natural science and physical anthropology. Ernst (1987) led the way in the emerging field of craniology, but it was Marcano (1889a, b) who conducted the first major study based on 157 skulls obtained in archaeological contexts, some of which had artificial deformations. Using skeletal remains (skulls and long bones) retrieved from funerary contexts in the Orinoco and Lake Valencia, Marcano conducted a craniometric/osteometric study that stimulated further similar research, including the one by Virchow in 1893, who investigated the cranial capacity of the indigenous Guajiros, based on the data recovered by Ernst (Arechabaleta and Mancera 1973).

In 1896, Rafael Villavicencio offered the first course in physical anthropology available in Venezuela. From this point on, the relative position of human beings within the group of primates and concerns about phylogeny, as well as the origins of the early Amerindians, became topics of scientific interest in academic contexts, in spite of anti-evolutionary attacks by defenders of Catholic dogma (Arechabaleta and Mancera 1973). Comparative studies, based primarily on cranial features, emphasized the similarities between the indigenous peoples of the Andes and Central America, while others claimed a direct link between the so-called primitive man and some American races (Toro 1906 and Febres Cordero 1920 in Arechabaleta and Mancera 1973). During the early twentieth century, physical features of the Amerindians, particularly cranial anthropometric indexes and artificial deformations, became key research topics, such as in the work of Jahn (active 1923–1932) and that of Lisandro Alvarado (active 1930–1945) (Arechabaleta and Mancera 1973). Although descriptive in nature, these investigations were all concerned with anthropometry, human paleopathology, child growth, and the possible existence of pygmies in the Americas (Comas 1960). In this line of research, we find the contribution of Fleury Cuello (1953) on the anthropometry of the Motilones of Zulia State. This concern for the characterization of Amerindians as pygmies continued to be seen in the studies of the pre-Hispanic skeletal material excavated in the Cemetery of Quíbor in Lara State in the 1960s and 1970s (Lucena Goyo 1982). Interest in craniometry and artificial cranial deformation continued into the twentieth century (see Arechabaleta 1979; Lagrange de Castillo 1979); nonetheless, following this initial phase of research on skeletal remains, physical anthropology in Venezuela changed its emphasis to genetic, forensic, and other concerns. Genetic concerns matched wider interests on the topic combined with local concerns on mixed descent (mestizaje), heredity, gender, and genetic diversity (Castro de Guerra and Suarez 2010). The forensic turn was the result of a combination of factors including the role of forensic and archaeology students in the investigations of a massacre that took place in Caracas during the administration of Carlos Andres Peréz known as El Caracazo. FUNDACREDESA, founded in 1972, through the

SENACREDH project, aims to determine the characteristics of the Venezuelan population of the early twenty-first century, with a focus on the demographic, social, and physical growth, nutritional status, intellectual development, food consumption patterns, and hematologic, biochemical, parasitological, and dental aspects. Another area that has significant development is biological anthropology in its relationships to sports (Garcia Avendaño 2007).

The Construction of the Indigenous Other

This Eurocentric colonial legacy consolidated into a detached perception of the indigenous other (Scaramelli and Tarble de Scaramelli 2005). A long-term misunderstanding between the various sectors of the colonial and post-colonial society evolved diacritically to affect collective worldviews and attitudes towards ancient archaeological sites, material culture, and indigenous burials. As a consequence of intellectual attitudes resulting from an evolutionary paradigm, the native people, as descendants of ancient societies, became characterized as a primitive, obsolete, and exotic sector of national society, perceived as a lower stage of human evolution. The archaeological past was only rarely considered to have continuity with the neo-colonial present. This received wisdom permeated day-to-day interethnic relations, state policy on indigenous affairs, and the "official" history of the nation, where indigenous contributions to the national society were downplayed or denied outright (Morón 1956). This attitude also permeated the academy, museums, and research centres, where human remains were deposited to be studied and exhibited as curiosities of scientific interest, with no thought concerning ethical issues and human rights of the indigenous groups involved.

Often combined with more mundane pecuniary values, and plainly in the tradition of the search for "El Dorado", the aforementioned dichotomy ("Us" vs "Other") also stimulated a long-term indifference in relation to the destruction of archaeological and burial sites by Venezuelan Nationals. In their search for gold and Spanish treasure, looters have contributed to the destruction of archaeological sites, both in municipal and in private lands, including those located in the indigenous territories to the south of the Orinoco and along the Venezuela–Colombia border. These activities are extensive throughout the country and involve pervasive legends that serve to justify the removal of indigenous objects, sacred artefacts, and even funerary remains in the quest for elusive riches (Ekman and Chacón 2006). Burial caves, cemeteries, and ceremonial locations situated in indigenous territories, even those currently in use, have suffered serious damage or have been subjected to excessive visiting and profanation.[1] These activities have caused intense anger and animosity among affected indigenous collectives, leading to further the schism between sectors of Venezuelan society.

[1] Among these are found the ancient cemeteries of Cerro Las Piñas, Caño Ore, and Cerro Lugo, locations that have been venerated for centuries by the natives of the Orinoco (Perera 1972, 1983, 1993; Scaramelli and Tarble 1993, 1996).

As a result of these ingrained attitudes, modern scientists who study archaeological remains and human skeletal materials are faced with a legacy of suspicion and disbelief on the part of the indigenous and rural Criollo sectors alike (indigenous peoples are concerned with profanation of sacred sites, while Criollos are more concerned with the potential loss of "riches" or "treasure" they believe to be found in archaeological sites). Even so, there has been little concern regarding conflicts between scientific objectives and ethical issues. Although there is not a well-developed programme for archaeo-osteological research Venezuela, skeletal remains continue to be excavated and removed for analysis and storage in museums and research centres with little or no consultation with local communities. This was common practice throughout the twentieth century, and even as late as 1991, in the Sierra de Perijá, Zulia State, several burials were taken from a Japreria funerary cave without permission from the community.

Many of the human burials found in southern Venezuela have been removed from caves, rather than excavated. Acidic soils tend to destroy bone in this part of the country, and very few interments have been recovered (an exception is found in Roosevelt 1980). Several underground cemeteries have been excavated in northern and western Venezuela, where preservation is better, whereas rock-lined agricultural terraces and niches, locally referred to as mintoyes, are frequent in the Venezuelan Andes. In Quibor, Lara State, a large cemetery found beneath the town was publicized as the repository for an ancient "pygmoid" population, an interpretation now rejected by the scientific community but still alive in the popular imagination. In 1967, the cemetery was declared to be a protected site, and currently, there is a project to convert the cemetery into an on-site museum (Instituto del Patrimonio Cultural 1997b). In the meantime, a reconstructed burial is a prominent display in the local museum.

Unfortunately, many of the institutions that carry out archaeological investigations have inadequate storage facilities for skeletal remains, and the original burial contexts have been lost or were not documented systematically. In the case of one museum housing one of the most important skeletal collections recovered from excavations in the Lake Valencia region, the bones were separated with elements stored in separate boxes so that original relationships cannot be reconstructed (Chávez 2007; Díaz 2004). The above-mentioned cemetery at Quibor was also excavated initially with poor control of provenience (Lucena Goyo 1982); only, the later excavations have employed rigorous excavation and recording methods (Centeno et al. 1986; Vargas et al. 1997).

From Indifference to Involvement (1990–2008): Recent Policies for the Treatment of Human Remains

In recent years, the aforementioned cases, among others, have attracted the attention of different sectors and interest groups concerned with ethical dilemmas and controversial issues involving the treatment of human remains. Inspired by

international agreements aimed at regulating the study and treatment of human remains, new policies are being forged that incorporate the rationale of the novel Bolivarian Venezuelan state, conceived as a multicultural, multiethnic entity proclaimed in the Constitution of 1998. New interest and involvement of government institutions in the control and management of cultural and biological heritage can be observed on several fronts. On the one hand, an important step was taken to regulate the study, documentation, conservation, and protection of archaeological sites in Venezuela through the creation of the Instituto de Patrimonio Cultural (Institute for Cultural Patrimony or IPC). The IPC instigated an extensive survey of historical and archaeological sites with the intention of creating a centralized archive to serve as the basis for the protection and management of the country's cultural patrimony (Instituto del Patrimonio Cultural 1997a). Unfortunately, in spite of these measures, this institution does not have a specific protocol for the registration/protection of archaeological sites containing human remains such as burial sites and cemeteries. Some of the most important threats affecting the preservation of these sites include the lack of adequate educational programs concerning the scientific importance of human remains and bones found in archaeological contexts; the uncontrolled visitation of archaeological sites; the unrestrained growth of adventure tourism in areas that should be under protection; and the macro-development plans which, in the past, have destroyed important sites without previous survey. Nevertheless, despite the obligations of the State in the protection and conservation of archaeological sites, the main problem lies in the indifference and lack of authority on the part of the official government institutions in charge of the protection of historical and cultural patrimony.

On the other hand, indigenous groups have increasingly found mechanisms to express their voice regarding matters related to ancient knowledge, cultural and biological patrimony, and territorial rights. Both grass roots political movements and official government policy have addressed the need to regulate research in indigenous communities, with increased concern for the need to obtain prior informed consent, especially in regard to collective traditional knowledge (Colchester 2004; Castillo 2004). Following the creation in 2007 of the Ministerio del Poder Popular para los Pueblos Indígenas (MPPPI), strict restrictions on anthropological and other investigations were implemented in Amazon State and in other primarily indigenous regions of the country. At the same time, in the Ley Orgánica de Pueblos y Comunidades Indígenas (Organic Law for Indigenous Peoples and Communities) passed in 2005, an article was included that stipulates that the State, in conjunction with indigenous communities, will protect and preserve archaeological patrimony and promote its recognition as cultural heritage of indigenous peoples and the nation.

The initiative to establish operations in bioethics and biosecurity in scientific research in Venezuela was originally proposed by philosopher Luis Castro Leiva who was part of the Board of Directors of the Consejo Nacional para Investigaciones y Tecnologicas (CONICIT) in 1994. After prolonged consultation, on January 4, 1999, the Board of Directors approved the publication of the first edition of the Code of Bioethics and Biosecurity. Taking into consideration the

guidelines of international agencies, local scientists contemplated the urgent need to overcome shortcomings in this area (Ministerio del Poder Popular para la Ciencia y Tecnología [MPPCT]/Fondo Nacional de Ciencia, Tecnologia e Investigación [FONACIT]). Consequently, the MPPCT and FONACIT undertook actions in the field of science and technology, with the hope of contributing to the promotion of bioethics in academic, scientific, and business sectors. Official representatives have joined forces to draft a legal instrument dealing with human rights and bioethics, denominated Código de Bioética y Bioseguridad (Code of Bioethics and Biosecurity). As proposed by the Comisión de Etica, Bioética y Biodiversidad (Commission on Ethics, Bioethics and Biodiversity) of the MPPCT and FONACIT, in the general section on norms for the investigation of biological samples and human remains obtained from archaeological investigations (Chapter 5 of the Code), these materials must be treated in the following way:

(a) "Human remains of any kind must be treated with dignity and respect".
(b) "Due to their unique, sensitive, and controversial nature, as well as their importance for understanding the human past, archaeological collections of human remains must be preserved under appropriate environmental conditions to ensure their preservation and access to future researchers. Similarly, the human specimens should receive proper storage and respect, consistent with their nature as a representation of a human being".
(c) "The excavation and removal of human remains to laboratories or collections should respect adequate measures of protection and care, and take place only when strictly necessary, in order to fulfill the objectives of the investigation. In the event that human remains are linked to individuals or communities who may feel affected by their excavation or removal, the conditions of such activities must be discussed and agreed upon with those individuals or communities, so as to establish a respectful relationship and balance between the interests of the researcher and feelings of others" (Comisión de Etica, Bioética y Biodiversidad 2009).

As can be seen, this code of bioethics and the laws regarding indigenous rights represent a decisive break with deep-rooted colonial legacies in which archaeological and other research was carried out with no concern for the beliefs or desires of local communities, indigenous or not. They do so, what is more, without inflating or endorsing ethno-nationalistic movements aimed at blocking the scientific investigation of bones and other archaeological remains. At the same time, they introduce into the legal domain aspects regarding mutual cooperation, responsibility, and commitment between local communities and investigators. In the case of the Code of Bioethics and Biosecurity, the document recognizes that the excavation, study, management, conservation, and the final deposition of samples of ancient human remains are controversial issues that are often difficult to reconcile.

Final Remarks

In our opinion, archaeological research on human remains has a scientific value that may not be fully shared by the communities linked to the remains. Even so, we believe that they contain potentially useful information, especially on the evolutionary history of our species and its capacity to adapt to different socio-cultural and natural environments. Moreover, human samples can provide information on the state of health, diet, and activities carried out during the lifetime of the person and/or communities whose remains are analysed and can give insight into possible distinctions of status, gender, and age that may have obtained in the society under analysis. The enormous scientific value of this information is a morally acceptable justification for studying human remains, and we propose that through an adequate explanation of these goals, many communities will be inclined to partake in collaborative research. We would point out, nonetheless, the need to take into consideration local specifications as to the treatment of the remains and follow through by sharing results, both in published form and through public forums. Many of the complaints about archaeological work arise from the lack of involvement of the communities in the process of the research and in misunderstandings regarding the length of time it requires to process and publish the results.

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