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Introduction

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Introduction

Anne L. Grauer

The field of paleopathology, like many scientific disciplines, has changed profoundly over the past decades. Technological advances, new theoretical approaches, and the inclusion of diverse voices in the creation of and discourse surrounding data collection and analysis have influenced all aspects of our understanding of health and disease in the past. These strides have also contributed to the increasing complexity of our field; a complexity that necessitates multidisciplinary collaboration between medical, biological, and social scientists, as well as humanists, to address significant questions in a contextually rich manner. The interpretation of disease now extends beyond the recognition of its presence in the past to include deep archaeological and social contexts within which human and animal pathology is rooted, sophisticated means to detect the presence and evolution of pathogens and host responses, and ways in which our research informs the future. It also includes existential reflection on social and political privilege, past and present. Subsequently, we have moved beyond a limiting definition of ‘violence’ from direct trauma to recognizing and confronting social violence-- the deeply embedded structural inequities that have privileged a few and inexcusably harmed others. In parallel, efforts to decolonize academic fields, including paleopathology, are being organized, as evidenced in this volume.

What’s in a name? Everything.

By nature of its name, research within the field of paleopathology (*paleo* = ancient, *pathology* = the study of disease), ought to be straightforward. It is not. In fact, the very definitions of the terms *paleo* and *pathology* have changed since the inception of the discipline and reflect its contributors and their intellectual environments. The definitions also influence the questions we ask, the data we collect, and our understanding of the past (Buikstra, 2010; Grauer, 2012). For instance, some of the earliest exploration into ancient disease reported on pathological conditions in fossil remains in non-human taxa recovered from mountainous and cavernous regions of Europe (see, for instance, Esper, 1774; Goldfuss, 1810; and Schmerling, 1835). Later, 19th-century and early 20th-century physicians and anatomists, such as Sir Marc Armand Ruffer (1859-1917), Frederic Wood Jones (1879–1954), and Grafton Elliot Smith (1871–1937), centered their attention on diagnosing disease in Egyptian mummified remains, in part influenced by French occupation of the country in the 18th century and British occupation in the 19th and early 20th centuries, and the public’s growing romanticized colonialist construction of the cultural past. The foci of North American scholars rested on living and deceased Native Americans (see for instance Hrdlicka (1908), and Hooton’s analysis of skeletal remains of Pecos Pueblo individuals (1930)), as they were seen to represent present day vestiges of ‘primitive’ and ‘savage’ past human life, had sacred burial grounds that were legally unprotected from archaeological excavation and looting, and held little to no political power to advocate for themselves or their ancestors.

Throughout the 20th century, the *paleo* aspect of the field of paleopathology continued to center on the analysis of human remains of individuals or groups accessible to researchers with resources to travel and undertake scientific research, access to education, and the socio-political authority to disinter and dislocate human remains. The timescale of inquiry (i.e., millennia or centuries), therefore, was less of an impetus for exploration than the ‘fortuitous’ access to mummified and/or skeletonized human remains. Recognizing these biases is essential, as the extraordinary number of analyses completed on North and South American, British and European, and North African human remains is not a gauge of the importance of these populations in human history, but rather reflects axes of power during centuries of colonization. Hence, *paleo* for many of these decades has been defined through a decidedly Western lens that centers on distinctions between prehistory/history, precolonial/colonial, preindustrial/industrial, and views time as linear and progressive. Lost and/or overlooked are insights into cyclical aspects of health and disease, traditional knowledge impacting illness and treatment, and experiences of peoples over the vast geographical areas of Asia and much of the African continent.

Definitions of the term *pathology* have also changed over time. For instance, throughout much of the 19th and up to the late 20th century a decidedly biomedical model was adopted to explain the presence of disease. That is, the human body could be expected to function “normally” unless affected by singular causal agents such as pathogenic invasion or malfunctioning organs. Hence, paleopathological investigations sought to identify changes to the human skeleton or in mummified remains linked to specific known diseases (and see Chapter 12 on mummified remains, this volume.). Midway through the 20th century, however, paradigmatic changes took place that increased both the scope and complexity of the concept of disease (Mason, 1975, and see Chapter 22 on the concept of stress, this volume). Selye (1957, 1973), for instance, revealed that measurable biomolecular changes took place in the body provoked by environmental conditions such as cold temperatures or excessive and prolonged exercise. These changes reduced the individual’s tolerance to other injuries or pathogens and, when prolonged, eventually led to death. He labeled this pathophysiological response the General Adaptation Syndrome (GAS). Concomitantly, other researchers such as Audy (1967) and Dever (1976) argued that simplistic disease models ignored deleterious physiological and psychological stress factors that contributed to or caused disease, and that failure to recognize the impact of adverse social and environmental conditions impeded health practice and policy.

Changing models of disease

The changing models of disease influenced paleopathological research (Grauer, 2018). First, they led researchers to appreciate the scientific value of lesions devoid of a specific etiology. Macroscopically recognizable skeletal changes, such as diffuse periosteal reaction linked to the body’s generalized response to inflammation or infection, or dental conditions such as enamel hypoplasia, linked to childhood dental development disruption, provided essential information about responses to stressors within individuals or populations, regardless of whether the stress could be identified. Goodman et al. (1984), Huss-Ashmore et al. (1982), and Lewis & Roberts (1997), for instance, use these “multiple stress indicators” or “non-specific stress indicators” to explore the roles that infection, nutrition, subsistence changes, and social environment play in human health and disease in the past. Even lesions associated with single-origin etiologies were re-evaluated in light of the recognizably complex interplay between hosts and stressors.

Identifying the presence of tuberculosis and/or leprosy in the past, for instance, sheds light on far more than the antiquity of the disease or host contact and response to pathogens; their presence is deeply intertwined with human social interactions, the interface between humans and animals, availability of and access to resources, and host immune competence (Roberts & Buikstra, 2008; Roberts, 2020, and see Chapters 17 on mycobacterial infections, and 18 on infectious disease, this volume). Importantly, new models of health and disease appreciate that environmental factors, human biology, and culture, working in consort can exacerbate and/or ameliorate states of stress or disease (Goodman & Armelagos, 1989; Temple & Goodman, 2014).

The Roots of Paleopathology

Under the influence of medicine

The field of paleopathology has global roots, albeit nurtured and amplified in some areas of the world and less well known, if not squelched, in others. The European and North American origins of the discipline have been outlined well by Moodie (1923), Jarcho (1966), Brothwell and Sandison (1967), Angel (1981), and Buikstra and Cook (1980), and more recently by Buikstra (2010) and Grauer (2018). These chronicles elucidate trends within paleopathology that, for the most part, follow the field's inextricable links to Western intellectual traditions, contemporary paradigms, and social and political power (see Chapter 10 on historical sources of knowledge, this volume). For instance, as mentioned previously, the earliest forays into paleopathology were conducted by 19th-century and early 20th-century European medically trained anatomists and physicians who sought to identify diseases of the past and catalogue their antiquity. Sir Marc Armand Ruffer (1859–1917), in particular, whose work linked known clinical manifestations of disease to identifiable lesions on Egyptian mummified and skeletal remains, earned him the moniker “Pioneer of Paleopathology” (Sandison, 1967). In following decades, clinical knowledge, supported by clear descriptions and increasingly sophisticated imaging technology, provided foundations for rigorous diagnoses. Anderson (1969, 1982) and Møller-Christensen (1961, 1965), for instance, offered refined diagnostic criteria for recognizing leprosy in human remains based on their extensive clinical and archaeological knowledge, while Hackett (1976) and Rogers and Waldron (1995) closely examined skeletal manifestations of treponematosi and joint disease, respectively. However, contributions to our understanding of disease in the past were also made by medically trained doctors such as Karl von Baer (1860) from Estonia and Yoshikiyo Koganei (1894, 1934) and Kiyono and Hoshijima (1922) from Japan, whose names rarely show up in publications.

The roles of physical anthropology and archaeology

Paleopathology was also influenced by other fields. The late 18th and early 19th-century intent of physical anthropology to examine human populations and to classify them into types or groups led Ernest Hooton (1887-1954) to include a population-based study of noted pathological conditions within his typological analysis of Native American skeletal remains from Pecos Pueblo, New Mexico (Hooton, 1930). He linked pathological conditions to the group's diet, the presence of infectious disease, and the changing environment. Similarly, Aleš Hrdlička (1869-1943) adopted a population approach in his published a report on pathological conditions

witnessed on the skeletons of “Ancient Peruvians” whose remains were collected from excavations or left behind as ‘debris’ from looters (Hrdlička, 1914).

Archaeology also influenced paleopathological research. The early emphasis on cataloguing and reporting excavated materials to preserving the past was criticized mid-century, and a “New Archeology” was introduced positing that quantitative scientific investigation of mortuary remains offered insight into social dimensions of the past (see Willey and Phillips, 1958; Binford & Binford, 1968; Saxe, 1970; and Binford, 1971). These researchers argued that social responses to environmental change were predictable and that aspects of social interactions, such as ‘social status’, could be readily identified in the archaeological record. The subsequent critiques of “New Archeology,” posed by Hodder (1982), Shanks and Tilley, (1982), and Earle and Pruecel (1987), to name a few, countered that human behavior was far from predictable and universally absolute. They asserted that most archaeological interpretation was “deterministic” and “positivist”, with little to no objective “truth” at its core. These paradigmatic approaches influenced the rise of a bioarchaeological approach towards interpreting human skeletal remains (Buikstra, 1977). As Armelagos and Van Gerven (2003) and Buikstra and Beck (2006) clearly articulate, understanding the presence and evolution of human disease requires researchers to carefully place skeletal analysis deeply within archaeological contexts. Recognizing skeletal changes does not *ipso facto* provide a definitive diagnosis nor does it offer insight into host/pathogen relationships, the multifactorial aspects of human health and disease, or human adaptation. Rather, the complex ecological, climatic, and social conditions within which the individual(s) lived must be explored. So began a rift between paleopathological practice in Europe and the United States, whereby European practitioners with medical backgrounds honed their skills in diagnosis of single cases, while their American counterparts with anthropological training explored the presence and social aspects of disease within populations (Roberts, 2006; Mays, 2010).

Legacies of colonialism, privilege, and racism

Essential to confront, and undeniable to ignore, is the fact that the roots of paleopathology worldwide are entangled within centuries of colonialism, scientific racism, and social inequity. Early European physicians, for instance, exercised their colonial social and political privilege by collecting the mummified and skeletal remains of ancient Egyptians in the name of scientific inquiry. Even the first “Paleopathology Club”, which met in 1973 and later became the Paleopathology Association, an international scientific organization, began as a gathering to unwrap the mummified remains of an individual from 7-8th century BC Egypt. Throughout Europe and the United States, vast collections of skeletal remains were amassed by physicians and anthropologists, alike, to assist with teaching, serve as bases for research, and/or simply kept as curiosities. Roberts and Mays (2011) report that over 80,000 human remains are currently curated in UK institutions alone, while in the US, well over 100,000 human remains disinterred from Native American sites are held in federally funded institutions, with over 57,000 repatriated under the Native American Graves Protection and Repatriation Act (Buikstra, 2019). These figures do not include the vast number of remains that make up medical/anatomical collections such as the Robert J. Terry, the Hamann-Todd, and the W. Montague Cobb collections in the United States, or the identified human osteology collections in Portugal (Ferreira, et al., 2104), Brazil (Cunha et al., 2018), and Italy (Carrara et al., 2018). And, importantly, the tally ignores the estimated peak of 60,000 skeletons per year exported from India and sold over a 150-year

period to universities, hospitals, schools, and the general public until the ban in 1985 (Agarwal, 2022).

As astonishing as these number are, the key issue is not the quantity of human remains in collections worldwide, it is whose bodies were relegated to become ‘specimens’. It is well known that 19th century medical doctors and students in the US, needing practice in anatomy, pathology, and surgery, met their needs by hiring grave robbers to disinter the recently buried (often African American decedents) and acquired bodies of individuals who had died in institutions without family members to collect and bury them (Nystrom, 2011, 2017; Watkins, 2018). Soppol (2002) argues that it wasn’t uncommon for those of greater economic means to feel it was the poor’s duty to offer themselves to the professionalization of physicians as restitution for their dependence on taxpayers. In the UK and Europe, extensive excavation of human remains over the past century has yielded thousands of skeletons available for paleopathological investigation, but excavations rarely take place in cemeteries with elaborately marked graves or alongside churches with affluent parishioners. Hence, it is clear that the human remains we use to understand disease in the past reflect centuries of power and privilege at the expense of the poor, marginalized, and disenfranchised; individuals without political power and who never gave consent (Blakey, 2020a; de la Cova, 2020; Rankin-Hill, 2016). The same has been argued for skeletal remains in identified human skeletal collections (collections where the name and information about the individual has been retained) and for unidentified anatomical collections amassed through commercial means (Muller et al., 2017, and see Chapter 21 on ethical considerations, this volume). In these circumstances, laws may have been followed and care taken in the curation of each individual; but while it might legal (now or in the past) to excavate or buy and sell human bodies and body parts, for the most part, the remains of the wealthy, politically powerful, and socially connected are *not* the ones whose bodies are exhumed or curated in collections without their or their family’s consent (Alfonso & Powell, 2006; Williams & Ross, 2021). These are the legacies of our discipline. These are our roots. Recognizing the vestiges of power and privilege is the first step in moving forward to decolonize our field.

Branching out

Towards improvement of standardization and rigor

Paleopathology has moved forward in many directions since its inception (Grauer, in press). For one, considerable focus has been placed on standardizing data collection. Jarcho’s (1966) concern that paleopathology suffered from unsystematic data collection and weak methodological work has been met with efforts in the US (see Rose et al., 1991; Buikstra & Ublaker, 1994; Harris and Rose, 1995; and *Osteoware* developed by researchers at the Smithsonian National Museum of Natural History, <https://naturalhistory.si.edu/research/anthropology/programs/repatriation-office/osteoware>). In Britain, Brickley & McKinley (2004), Roberts and McConnell (2004) and Mitchell & Brickley, (2018) provide guidance in recording skeletal changes that are clear, systematic, reproducible, and comparable. These efforts have contributed to the use of coherent terminology that reduces misinterpretation: for instance, the use of the medical term “erosion” is not suitable for paleopathology since it could ambiguously refer to both antemortem and taphonomic processes. In 1992, the Paleopathology Association compiled a list of terms to encourage clear

communication between researchers (see Buikstra, 2016). More recently, Manchester et al. (2016) have produced an extensive document defining hundreds of suitable terms organized into categories such as functional and systemic anatomy, physiology, pathology, radiology and taphonomy. Terms are predicated upon an understanding of biological and taphonomic processes, not merely physical description, allowing this massive guide to enhance effective communication within and beyond the field of paleopathology.

Rigor in diagnosis has also received considerable attention. Compendia specifically designed to assist with disease diagnosis in dry bone specimens, such as Steinbock (1976), Ortner & Putschar (1981), Aufderheide & Rodriguez Martin (1998), Ortner (2012), and most recently Buikstra (2019), emphasize pathophysiological bases for disease processes in bone and place pathological conditions into archaeological contexts. The need for scientific rigor has also been tackled by Appleby et al. (2015), Klaus (2015), Buikstra et al. (2017), Lawler (2017), Mays (2020), (and see Chapters 2 on data collection and protocols, 3 on rigor and differential diagnosis, and 16 on treponemal infections, this volume), to name a few. They warn of the dangers of spurious diagnoses without differential diagnosis (clearly outlining other possible diagnoses and why these are less reasonable options) and address the importance of utilizing modern clinical data to inform conclusions. Continued work to ensure that paleopathological diagnoses and interpretations are based on sound evidence will strengthen our field immeasurably (Zuckerman et al., 2016).

Technological advancement

Like many of the sciences, technology has played an important role in advancing knowledge. The field of paleopathology is no exception. Sophisticated imaging techniques, for instance, have allowed us to view pathological changes without destruction to bone and other tissues (Öhrström et al., 2010; Miccichè et al., 2018; Morrone et al., 2021; and see Chapter 6 on imaging techniques, this volume). Microscopy, too, allowing for the growth of paleohistopathological study of tissues, has advanced appreciably, in spite of the considerable challenges posed by the effects of tissue damage over time and the need to limit destruction of valuable mummified and skeletal remains (see Chapter 5 on histology, this volume). Biomolecular applications to paleopathology, including stable isotope and genetic analyses have also contributed profoundly to our field. Assessing the isotopic signatures of human and animal tissues offers insight into local ecologies, patterns of migration, and diet—all factors contributing to disease past and present (Scorrano, 2018; Toyne & Turner, 2020; and see Chapters 7 on stable isotopes and 20 on dental disease, this volume). Analyses of biomolecules such as DNA (aDNA) of bacteria and proteins (proteomics) move us substantially closer in our quest to understand the presence, evolution, and human response to pathogens (Orlando et al., 2021; and see Chapter 8 on genetics, this volume). In spite of the methodological, computational, and ethical obstacles faced in biomolecular analyses, of which there are many, genetic, genomic, and proteomic studies have captured the presence of pathogenic bacteria, such as *Mycobacterium* (associated with tuberculosis and leprosy) and *Yersinia* (associated with the plague) and viruses such as *Variola* (associated with smallpox) (Mühlemann et al., 2020), to name a few.

The importance of social theory

Technological advancement, however, is not a paleopathological panacea—it does not answer all questions or, as the public may think, render obsolete other avenues of inquiry. Acknowledging the complexity of disease has also contributed to our field. Gone are simplistic notions that disease is characterized by interactions between a pathogen and a host (or, for that matter, that detecting pathogenic DNA informs us about *disease*). The creation of biocultural models mapping the interplay between varied dimensions of human life alongside human biology, and bioarchaeological models that adapted these models to explore the past, disclose the many variables that contribute to and/or mitigate human disease (Zuckerman & Martin, 2016). Current research has investigated the affects of comorbidity in the past, as numerous conditions provoke or are intricately linked to other conditions. Researchers such as Meyer (2016), for instance, warn against precise diagnoses of specific vitamin-related deficiencies in light of the ways that nutritional deficiency and metabolic disease can elicit similar osteological responses (or none at all) and the fact that these two conditions are often found together in human populations. Similarly, van Schaik (2018), Lockau and Atkinson (2014), and Brickley et al. (2018, see also Chapter 19 on metabolic and endocrine diseases, this volume) directly confront the limitations, complexities, and promise of evaluating the effects of comorbidity in the archaeological record. Alongside the concept of comorbidity, the theory of syndemics (synergistic epidemics) posits that the presence of two or more disease clusters within a population exacerbates the effects of conditions and intensifies disease burden. Researchers exploring paleosyndemics, such as Sattenspiel and Herring (2010), Schug and Halcrow (2022) and Larsen and Crespo (2022), offer new ways to interpret co-occurring diseases such as leprosy and plague epidemics in medieval Europe, or the relationship between mal- or undernutrition and infectious disease, or socio-economic oppression and chronic disease.

The complexity of the human disease experience has also been tackled head on by intricately weaving social theory into the discourse surrounding health and disease in the past; an approach often referred to as social bioarchaeology (Agarwal & Glencross, 2011, and see the series *Bioarcheology and Social Theory*, D. Martin, Series Editor, Springer). Here, humans are seen as active participants in all dimensions of their lives, throughout their life course, and not simply passive reactors to the world around them. The approach requires deep introspection on the part of researchers and reflexive thought on the limitations produced by the personal lens through which we see the world (Watkins, 2020). Although the ways in which social theories are now used to inform our understanding of past diseases are too vast to discuss in this short space, a few examples provide insight into the promise of these applications.

Through the lens of feminism and queer theory, for instance, scholars such as Geller (2008, 2009), Hollimon (2011), and Stone and Zimmer (Chapter 24 on issues of gender and agency, this volume), have explored how definitions (and thus preconceived notions) of sex and/or gender have led to distorted conclusions about variation in disease presence and susceptibility. Differences in pathological conditions noted between individuals deemed ‘female’ or ‘male’ do not verify the presence of division of labor, nor does the *a priori* assertion that division of labor was present uniformly lead to differences in disease experiences, especially when the estimation of ‘biological sex’ is problematic (Klales, 2020) and evidence of disease rarely, if ever are limited to single group (e.g., Standen et al., 1997). Disability theories, too, inform paleopathology (see Chapter 25 on disability and impairment, this volume). As an example, the medical model of disability views physical change as a functional impairment. Paleopathologists noting morphological changes in bone often conclude that an individual’s ability to “function normally” was impacted, that the individual was productively limited, and was, in fact, *disabled*.

However, adopting the modern stigma-laden label of “disabled” for individuals in the past does the field of paleopathology a gross disservice. It obscures the potential to understand the nuanced ways that individuals and groups treated human variation in the past, which, in fact, may be far different than now (Marsteller et al., 2011; Tilley and Oxenham, 2011). Adopting a social, rather than medical model of disability, which views the concept of “disabled” as a social construct that varies between individuals, families, and communities (Oliver, 2013, and see Chapter 14 on congenital and developmental disorders, this volume), and is centered deeply in identity, has far greater potential to shed light on the presence and effects of disease on lives of individuals in the past (see Chapters 11 on osteobiographies and case studies, and 15 on tumors and neoplasm, this volume). Lastly, theories of violence, which often center on interpersonal aggression and the male predilection for the behavior (Pinker, 2012), have been replaced in paleopathology with a far less reductionist view that recognizes the cultural complexity and ranges of behavior (Martin & Harrod, 2015; Tung, 2021), the varying participants (Redfern, 2006, Redfern & Roberts, 2019), and the insidious ways that social and economic power can lead to structural violence (Mant et al., 2021, and see Chapters 13 on trauma, 23 on infants and children, 26 on social marginalization, and 27 interpreting violence, this volume). In all, adoption of social theory into paleopathology has brought us far from our roots of hunting for the oldest or most severe case of a disease and has allowed us to hypothesize about causes, effects, transmission, and evolution of disease over time and space (see Chapters 20 on dental disease, 28 on evolutionary approaches, and 29 disease in the fossil record, this volume).

Looking back and moving forward

Looking back as a way to move forward is a uniquely paleopathological approach that provides powerful perspectives on disease past, present, and future. Buikstra and Roberts (2012), for instance, in their volume *The Global History of Paleopathology: Pioneers and Prospects*, aggregate the perspectives of over 90 authors worldwide who provide biographies of key figures in the field, snapshots of work conducted across the globe, and future developments. The varied voices reflect both the roots and future of the discipline, with much work being conducted in the past and present by European, UK, and North American-trained scholars, but with a sensitivity to the imperative of broadening the scope and amplifying diverse voices. The edited volume *New Directions in Biocultural Anthropology* (Zuckerman & Martin, 2016) centers attention on the powerful biocultural model that informs us not only about health, disease, and diet, past and present, but also about identity, especially aligned with race, politics, violence, and inequity. Indeed, perspectives adapted from paleopathology contribute to our understanding of current issues and future outcomes. In Buikstra’s (2019) edited volume, for instance, authors tackle essential contemporary issues, including the public’s misinformed view of violence in the past and subsequent ‘modern’ attitudes (see Redfern & Fibiger, 2019, and see Chapter 32 on paleopathology in the public eye, this volume), the continued trope that genetic data supports ‘races’ as biological and absolute categories that explain differences in disease experience (see Stojanowski, 2019), the stance that gender is binary and sexuality heteronormative (see Geller, 2019), and that ‘family’ or ‘kin’ is singularly defined by biological relationship (see Johnshon, 2019), to name a few.

In fact, paleopathologists have a great deal to say about our future. The biological and social effects of climate change can be viewed through an paleopathological lens. Nerlich and Lössch (2009), as well as Schug (2020, in press), offer many examples of groups that dealt with the

consequences of and adapted to environmental change. There are many lessons to be learned as we navigate through climatic changes today. Similarly, epidemics, are not new in human (or animal) populations (see Chapters 4 on epidemiology, and 31 on plagues and pandemics, this volume). Knowledge of their presence throughout history allows for modern predictions and offers insight into how disease spread can be mitigated (e.g., Fangerau, 2010; DeWitte, 2016; Galassi et al., 2020). Emerging and re-emerging diseases can also be evaluated with assistance from paleopathology. Barrett et al. (1998) and Roberts and Buikstra (2008) recognized that pathogens in the past, as well as now, rely on complex ecosystems that often center more on human behavior than human biology (and see Chapter 17 on mycobacterial infections, this volume). Altering the environment, human migration, maintaining close social connections, and effects of oppression and inequity can allow infrequent host/pathogen interactions to amplify and travel quickly. The complexity of human/animal interactions is equally essential to note, as the long evolutionary history of human and animal contact, along with modern human/animal associations, has influenced the paths of zoonotic infection (Bendry et al., 2019; Uhl et al., 2019; Bendry & Fournié, 2020; Littleton et al., 2022, and see Chapters 9 on parasitology, and 30 on faunal analyses, this volume). The ONE health approach, or as Buikstra et al. suggest --taking a ONE Paleopathology approach (see Chapter 33 on the future in paleopathology, this volume), which advocates adopting an evolutionary perspective of disease that incorporates the complex interactions between the environment, all nonhuman organisms, and humans—has the potential to profoundly contribute to our understanding disease in the past, the present, and in the future.

Confronting and deconstructing the legacies of colonialism and racism

The undeniably colonial and racist roots of medicine and physical anthropology, and thus paleopathology, are essential legacies to confront if paleopathology is to truly move forward (Walker, 2000; Lambert, 2012). Arguably, these efforts are not new; they have simply been ignored or worse, forcibly marginalized (Blakey, 2020a, 2020b). The New York African Burial Ground Project, which formally began in 1991 (Blakey & Rankin-Hill, 2004, GSA, 2009), serves as an exemplar for inter and transdisciplinary research, as well as for publically engaged bioarchaeology. The project modeled ways in which researchers from many disciplines and with varying approaches and voices, could develop innovative and unified strategies to understand the lived experiences of enslaved Africans living in 17th and 18th century New York City. The project also modeled how community engagement could positively influence paleopathological inquiry. Input from invested community members, more broadly defined than biologically related descendants, was actively sought prior to the commencement of scientific analysis. Questions posed by community members about their own past and the lives of those interred in the burial ground were as critical to explore as the often limited questions posed by most paleopathologists. For instance, rather than seeking to record the types of diseases present in the population, community members sought to understand ways in which individuals and the community adapted to and overcame extreme oppression. They sought to find a holistic understanding of the past, predicated by resilience and power (La Roche & Blakey, 1997). Projects, such as the recent excavation and analysis of the colonial-era burials at Belen, New Mexico, for instance, build on these foundations (Ralston, et al., 2022).

Efforts to confront issues of race, racism, and colonialism within bioarchaeology and paleopathology continue (see Chapter 21 on ethical considerations, this volume). Critical race theory and black feminist pedagogy, in particular, have cast a bright light on long-standing

vestiges of colonialism and consequential inequities. Scholars such as Watkins (2020), Williams (2021), de la Cova (2020), Lans (2019, 2021), and Muller (2020) make clear how skeletal and anatomical collections used by bioarchaeologists and paleopathologists to create baseline data from which inference about the past can be made is deeply problematic. Individuals' whose bodies make up most collections had neither the power nor option to consent. The social violence suffered in the past resonates to the present with the repeated use of their bodies within a system of privilege. However, it is essential to move beyond the recognition of historical and modern power dynamics towards praxis. How might we decolonize the collections and begin reparation? Candid and difficult conversations within paleopathological and bioarchaeological communities, supported by professional organizations such as the Paleopathology Association and the American Association of Biological Anthropologists, hopefully provide initial steps towards remediation. We have far to go.

The "Handbook of Paleopathology"

The intent of this volume is to provide readers with a snapshot of the field of paleopathology and fuel for discussion. The three parts tackle essential aspects of the discipline: Methods and techniques that we use to understand the past; specific diseases and conditions frequently explored in skeletal and mummified remains; and theoretical approaches that profoundly influence our interpretations and conclusions. Although this organization appears intuitive, upon reading the chapters, it is evident that the rubrics are not discrete. Chapters centered on methods and techniques offer readers fundamental details alongside applications of their approach. Authors centering their work on diseases and conditions, dive into foundations upon which diagnoses are made and how diagnosis leads to interpretations and conclusions. Weaving this all together are authors who introduce ways in which biological and social theories place health and disease into greater context. In fact, the authors exemplify the holistic nature of our field. Human biology, health, and disease, cannot be understood devoid of human culture, behavior, and the broader environment, and conversely, human culture, behavior, and the broader environment cannot be evaluated without considering the roles that human biology, health, and disease play, regardless of place or time.

An equally important aspect of this volume is the focus on deeply rooted biases and ethical concerns. Chronicling the discipline's history and drawing attention to the pervasive roles of power and privilege in the production (and exaltation) of scientific knowledge does not remedy the perpetuation of inequity; it only takes first steps to expose it. Contributors to this volume embody many identities and offer varied voices in an effort to decolonize our discipline and encourage reflection and reflexivity. This is the future of paleopathology.

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