CHAPTER 10

Conclusions and Future Directions: Converging Disparate Approaches in a New Biological Anthropology

C. de la Cova[1,2]

[1]Department of Anthropology, University of South Carolina, Columbia, SC, United States
[2]African American Studies Program, University of South Carolina, Columbia, SC, United States

Scholars of biological anthropology, and its subdiscipline of bioarchaeology, are uniquely situated to provide innovative knowledge on the relationship between biology, health, environment, identity, and the social conditions of past and current populations. However, for this scholarship to be convincing, effective, and applicable, researchers must move beyond one-dimensional analyses that solely discuss metrics, anomalies, pathologies, DNA presence, and nutrient intake. Bioarchaeologist Jane Buikstra (1977) was one of the first scholars to advocate skeletal analyses be situated within a cross-disciplinary and multimethodological framework that included cultural and environmental variables. Three years later Buikstra and colleague Della Cook (1980) stressed the utilization of a biocultural approach that addressed how social status and culture affected mortuary practices and skeletal disease processes. Cook (1981) later emphasized the importance of recognizing regional and historic factors in regard to biological differences associated with social status. Better methodological frameworks have emerged in recent years to assist biological anthropologists in environmentally, culturally, and socially contextualizing their research (Goodman and Leatherman, 1998; Goodman et al., 1988; Goodman and Martin, 2002; Klaus, 2012; Martin et al., 2013; Zuckerman and Armelagos, 2011).

However, cross-disciplinary analyses still remain underutilized by bioanthropologists. Emphasis is often placed on methodologies that address biological differences and pathologies. Thus, the individual(s) studied becomes silenced and subsequently the embodiment of

Beyond the Bones. DOI: http://dx.doi.org/10.1016/B978-0-12-804601-2.00010-7

their disorders, diseases, and differences. This results in a disconnect between the biological remains, social context, and identity of the deceased (Sofaer, 2006). Scholars of the new bioarchaeology, however, have advocated for improved integration of biological, social, behavioral, and ecological research (Agarwal and Glencross, 2011). Sabrina Agarwal and Bonnie Glencross (2011, p. 3) indicate that 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."

The best way to resocialize and rehumanize archaeological groups is through the incorporation of disparate lines of data and diverse methodologies that force the researcher to think beyond the bones to factors that comprise the lived experience of the individual(s) under analyses. This groundbreaking book, *Beyond the Bones*, illustrates, through thorough descriptions of cross-disciplinary approaches and disparate data sets, how this can be done so future researchers can conduct holistic and multidimensional skeletal biology-related analyses. Each chapter utilizes multiple methodologies and a diversity of data sets, including demographic sources, cemetery records, DNA, clinical research, historical documents, censuses, hospital records, public health data, linguistic models, migration information, and nutritional data. Whether it be comprehending the coevolution of Tanoan-speaking Pueblo Indians through the analysis of linguistic, genetic, and craniometrics relationships as discussed by Schillaci and Wichmann (see chapter: The Use of Linguistic Data in Bioarchaeological Research: An Example From the American Southwest), or reconciling historical documents, epidemiological data, environmental sources, and skeletal findings, like many scholars in this volume, including Murphy (see chapter: Fifty Shades of Grey Literature: Deconstructing "High" Infant Mortality With New Data Sets in Historic Cemetery Populations), Mant (see chapter: "Readmitted Under Urgent Circumstance": Uniting Archives and Bioarchaeology at the Royal London Hospital), Reusch (see chapter: Reading Between the Lines: Disparate Data and Castration Studies), and Marciniak (see chapter: Hunting for Pathogens: Ancient DNA and the Historical Record), each author demonstrates how these disparate lines of evidence can be woven together to create a holistic interpretation of paleopathological and skeletal findings.

Murphy, Mant, Reusch, and Marciniak illustrate the importance of consulting primary historical sources when examining groups with a documented past. These authors demonstrate the detailed information these data can provide in demographic, paleopathological, and DNA analysis. Murphy (see chapter: Fifty Shades of Grey Literature: Deconstructing "High" Infant Mortality With New Data Sets in Historic Cemetery Populations) discovers that, contrary to the high infant mortality rates archaeologists associated with past groups, historic cemetery data provides plausible low to moderate infant mortality rates comparable to those reported by historical demographers. Mant (see chapter: "Readmitted Under Urgent Circumstance": Uniting Archives and Bioarchaeology at the Royal London Hospital) discusses the importance of primary sources and the limitations of paleopathological samples in her Royal London Hospital analysis. Health-related documents provide a wealth of information, including diagnosis, cause of illness or trauma, occupation, possible residence, and social status of the individual(s) studied. Inferring social position allows the researcher to push beyond medical records, to reconstruct possible lifeways, access to resources, and what limiting factors may have impacted the health. If archaeological evidence, public health records, or other historical resources are present, these data can also be incorporated.

Reusch (see chapter: Reading Between the Lines: Disparate Data and Castration Studies) integrates historical data with numerous disparate sources to address castration, which is rarely discussed in the skeletal biological literature. Pulling from archaeological, zooarchaeological, paleopathological, anthropological, ethnological, medical, historical, and musical data, Reusch creates a temporally and biologically multifaceted methodology to locate and identify castrates in the bioarchaeological record. This approach narrows the historic time periods and geographic locations associated with eunuchs and elaborates on the skeletal changes observed in prepubertally castrated skeletons, including elongated long bones, kyphosis, and other modifications in the pelvis and skull. Reusch's research also forces skeletal biologists to consider the interaction between culture, gender identity, and status.

This volume also demonstrates how the disparate data can be utilized to address limitations inherent in bioanthropological data with a historical context (Mant and Marciniak). All skeletal collections, including archaeological remains, have undergone different selective or

preservational processes that make them unrepresentative of a normal population. These factors need to be addressed by the researcher. As Mant discovered, fracture rates in her skeletal samples were less severe and less varied than those documented in hospital records, which were more severe and affected mobility. She also observed more leg-related trauma in hospital documents and higher rates of broken ribs in her skeletal sample. Documentary evidence indicated that rib fractures were not considered serious enough to warrant hospital entry. Furthermore, dissection-related activities at the Royal London Hospital may have affected the composition of the skeletal sample.

Whilst Mant's findings highlight how collections can be biased (or underrepresentative) and disparate data sources can provide a more holistic picture of past groups, they also stress how these sources need to be evaluated. Recorded information associated with documented collections should be viewed with caution. Age-data is especially problematic as most past groups did not keep birth records. Occupation data may also be inaccurate. Furthermore, the researcher must always be conscious of the role social status plays in the creation of documented skeletal collections (de la Cova, 2012, 2014; Muller et al., 2016).

Marciniak (see chapter: Hunting for Pathogens: Ancient DNA and the Historical Record) also illustrates how historical records, especially those associated with the Roman Empire, need to be evaluated carefully to determine what constitutes known present-day illnesses. Her study, like Reusch's, relies on a plethora of disparate sources to argue that DNA molecular data, like osteological research, must be examined within the historical, archaeological, literary, cultural, and environmental contexts of the individuals being sequenced. These factors explain environmental-related illnesses, disease treatment, hygienic processes, and the impact landscape has on disease risk and exposure.

Other scholars in this volume stress the importance of integrating clinical and paleopathological research (Lockau, see chapter: The Present Informs the Past: Incorporating Modern Clinical Data Into Paleopathological Analyses of Metabolic Bone Disease). Skeletal biologists can only observe diseases and disorders after they have affected the skeleton, whereas clinicians see all the subtle nuances of illnesses and deficiencies, how they vary and progress through multiple stages in the soft tissue and skeleton, and their environmental and

genetic causative factors. Biological anthropologists should, as Lockau emphasizes, actively engage with this literature to better comprehend how disorders present in both the soft tissue and the skeleton. Scholars should also consult clinical literature to better comprehend environmental causations of illness.

Disparate sources are not only the result of cross-disciplinary research. Jelena Bekvalac (see chapter: Direct Digital Radiographic Imaging of Archaeological Skeletal Assemblages: An Advantageous Technique and the Use of the Images as a Research Resource) describes digital disparate data sets that are key to osteological investigation. These include osteological databases, digital imaging, direct digital radiography, computed tomography scanning, and 3D modeling. These methods allow bioarchaeologists to see beyond the bones, to their surface textures, shapes, and internal structures. All are imperative for advanced paleopathological diagnosis and nondestructive analyses of skeletal material. Scholars can also digitally scan remains for future study, thus minimalizing handling and damage.

Utilizing these disparate data sets allows the bioanthropologist to see beyond the skeleton to the lived experience. However, as a discipline, we should strive to not only understand the past, but connect our research to the present. Holland's (see chapter: Uniting Perception and Reality in Human Nutrition: Integration of Qualitative and Quantitative Data to Understand Consumption) examination of the social and cultural perceptions of vitamin D intake is applicable to both the past and present, as it is likely past groups, like contemporary students, did not comprehend the nutritional importance of vitamin D or the role it plays in bone maintenance.

Beyond the Bones clearly illustrates that disease, trauma, biological stress, and other anomalies and pathologies do not affect the skeleton in a vacuum. It emphasizes the importance of examining disparate lines of data in order to synthesize the complex interactions between skeletal biology, pathology, disease, nutrition, culture, and environment. Furthermore, the authors detail their methods and clearly explain the disparate sources utilized and their limitations. When read as a whole, *Beyond the Bones* provides various approaches on how to utilize multidimensional, cross-disciplinary research designs that integrate diverse disparate data sets. Each study reanimates and rehumanizes the individuals examined, placing them within their environmental, social,

and cultural contexts and illustrating how these factors impacted their skeletal health. It is imperative that biological anthropologists embrace these methodological approaches, which are central to the new bioarchaeology. Questions related to the impact of physical environs, culture, status, societal perception, or marginalization and stigmatization by society must be addressed using disparate sources so a more holistic social bioarchaeology can emerge.

REFERENCES

Agarwal, S.C., Glencross, B.A. (Eds.), 2011. Social Bioarchaeology. Wiley-Blackwell, Malden, MA.

Buikstra, J.E., 1977. Differential diagnosis: an epidemiological model. Yearb. Phys. Anthropol. 20, 316–328.

Buikstra, J.E., Cook, D.C., 1980. Palaeopathology: an American account. Annu. Rev. Anthropol. 9, 433–470.

Cook, D.C., 1981. Mortality, age structure, and status in the interpretation of stress indicators in prehistoric skeletons: a dental example from the Lower Illinois Valley. In: Chapman, R., Kinnes, I., Randsborg, K. (Eds.), The Archaeology of Death. Cambridge University Press, Cambridge, pp. 133–144.

de la Cova, C., 2012. Trauma patterns in 19th-century-born African American and Euro-American females. Int. J. Paleopathol. 2, 61–68.

de la Cova, C., 2014. The biological effects of urbanization and in-migration on 19th-century-born African Americans and Euro-Americans of low socioeconomic status: an anthropological and historical approach. In: Zuckerman, M.K. (Ed.), Are Modern Environments Bad for Human Health? Revisiting the Second Epidemiological Transition. Wiley-Blackwell, Malden, MA, pp. 243–266.

Goodman, A.H., Thomas, R.B., Swedlund, A.C., Armelagos, G.J., 1988. Biocultural perspectives on stress in prehistoric, historical and contemporary population research. Yearb. Phys. Anthropol. 31, 169–202.

Goodman, A.H., Leatherman, T.L., 1998. Building a New Biocultural Synthesis: Political-Economic Perspectives on Human Biology. The University of Michigan Press, Ann Arbor, MI.

Goodman, A., Martin, D., 2002. Reconstructing health profiles from skeletal remains. In: Steckel, R., Rose, J. (Eds.), The Backbone of History: Health and Nutrition in the Western Hemisphere. Cambridge University Press, Cambridge, pp. 11–61.

Klaus, H.D., 2012. The bioarchaeology of structural violence: a theoretical model and a case study. In: Martin, D.L., Harrod, R.P. (Eds.), The Bioarchaeology of Violence. University Press of Florida, Gainesville, FL, pp. 29–62.

Martin, D.L., Harrod, R.P., Pérez, V.R., 2013. Bioarchaeology: An Integrated Approach to Working With Human Remains. Springer Press, New York, NY.

Muller, J.L., Pearlstein, K.E., de la Cova, C., 2016. Dissection and documented skeletal collections. In: Nystrom, K. (Ed.), The Bioarchaeology of Dissection and Autopsy in the United States. Springer, New York, NY, pp. 185–201.

Sofaer, J.R., 2006. The Body as Material Culture: A Theoretical Osteoarchaeology. Cambridge University Press, Cambridge.

Zuckerman, M.K., Armelagos, G.J., 2011. The origins of biocultural dimensions in bioarchaeology. In: Agarwal, S.C., Glencross, B.A. (Eds.), Social Bioarchaeology. Wiley-Blackwell, Malden, MA, pp. 15–43.